From:	Metcalf, Gilbert
To:	Urbanas, Elizabeth (Beth); Jaffe, Judson; Hall, Daniel
Subject:	RE: Paulson carbon tax analysis
Date:	Thursday, January 26, 2012 8:35:00 AM

Yes. She reminded me about it when we had lunch yesterday. I'll ask Chris for it directly.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
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(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Urbanas, Elizabeth (Beth)
Sent: Thursday, January 26, 2012 6:54 AM
To: Jaffe, Judson; Metcalf, Gilbert; Hall, Daniel
Subject: Re: Paulson carbon tax analysis

Adele Morris in Econ Policy did the work at the toime (she has left and is at broolings). Chris is right person to ask.

From: Jaffe, Judson
Sent: Wednesday, January 25, 2012 06:53 PM
To: Metcalf, Gilbert; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth)
Subject: RE: Paulson carbon tax analysis

While Beth may have it, I'm sure Chris Soares in Econ Policy would have it (I didn't cc him as I wasn't sure if you wanted to loop them in at this point or not).

Jud

Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

From: Metcalf, Gilbert
Sent: Wednesday, January 25, 2012 6:52 PM
To: Jaffe, Judson; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth)
Subject: Paulson carbon tax analysis

Anyone have a copy of the Treasury carbon tax analysis that was done under Paulson? I think

Phil Swaigel worked on it. If not, could we track down a copy? (b)(5) [redacted]

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From:	Metcalf, Gilbert
To:	Soares, Chris
Cc:	Shore, Stephen; Mariger, Randall
Subject:	RE: Paulson-Swagel work on carbon tax
Date:	Thursday, January 26, 2012 1:38:00 PM

Chris,
Thanks. I'll look at these as well as anything Randy might have. Nothing new on carbon pricing in the works. I'm simply trying to understand what has been done to get a better feel for what we know and don't know. (b) (5) [redacted] So these materials are to help orient me a bit.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Soares, Chris
Sent: Thursday, January 26, 2012 12:37 PM
To: Metcalf, Gilbert
Cc: Shore, Stephen; Mariger, Randall
Subject: RE: Paulson-Swagel work on carbon tax

Gib, I found a few draft powerpoints from 2007-8 on a carbon tax proposal developed by EP. See attached. Also included is another on cap and trade from 2007 and some broader background material from that time that includes a brief and general discussion of carbon taxes v c&t. I wasn't involved in the drafting of these so I don't know the history. Much was done by Adele Morris when she was here, but Randy Mariger was also involved. He's cc'd and might have more info.

(b)(5) [redacted]

From: Metcalf, Gilbert
Sent: Thursday, January 26, 2012 8:42 AM
To: Soares, Chris
Cc: Shore, Stephen
Subject: Paulson-Swagel work on carbon tax

Chris,
A number of people have mentioned the work done under Paulson by Phil Swagel and your office on carbon taxes. I assume there is a memo or paper of some sort. Could I get a copy. (b)(5) [redacted]
Thanks.
Gib

Gilbert E. Metcalf
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(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From:	Metcalf, Gilbert
To:	Jaffe, Judson; Hall, Daniel
Cc:	Urbanas, Elizabeth (Beth)
Subject:	FW: Paulson-Swagel work on carbon tax
Date:	Thursday, January 26, 2012 5:30:00 PM
Attachments:	Climate Presentation 4-12-07 - 7pm.ppt Pro-Growth Climate Policy 3.8.08 v6.ppt Cap and Trade Climate Presentation 10.12.07 7am.ppt Climate notebook.zip

Here's what Chris sent. If Randy sends more, I'll forward.

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Email: gilbert.metcalf@treasury.gov

From: Soares, Chris
Sent: Thursday, January 26, 2012 12:37 PM
To: Metcalf, Gilbert
Cc: Shore, Stephen; Mariger, Randall
Subject: RE: Paulson-Swagel work on carbon tax

Gib, I found a few draft powerpoints from 2007-8 on a carbon tax proposal developed by EP. See attached. Also included is another on cap and trade from 2007 and some broader background material from that time that includes a brief and general discussion of carbon taxes v c&t. I wasn't involved in the drafting of these so I don't know the history. Much was done by Adele Morris when she was here, but Randy Mariger was also involved. He's cc'd and might have more info.

(b) (5)

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Cc: Shore, Stephen
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Thanks.
Gib

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(202) 622-0037 (fax)

Email: gilbert.metcalf@treasury.gov

From: Metcalf, Gilbert
To: "Kopp, Ray"
Subject: RE: Possible Carbon tax meeting at RFF 3/14
Date: Thursday, February 02, 2012 3:31:00 PM

Ray,
I've penciled it in. Peter's email address is (b) (6) @us.pwc.com I'll drop him an email and say that you might contact him. He was engaged on this issue back in 2009. The coalition of companies were focused on this while cap and trade was a real possibility. Their interest waned as soon as it died. But who knows; the fiscal climate has shifted so much since then that new sources of revenue have to be attractive.
Best,
Gib

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-----Original Message-----
From: Kopp, Ray [(b)(6) @rff.org]
Sent: Thursday, February 02, 2012 3:21 PM
To: Metcalf, Gilbert
Subject: Fwd: Possible Carbon tax meeting at RFF 3/14

Gib,
Great to see you yesterday. Sorry we didn't have longer to chat.
I want to alert you to a possible meeting of local DC tax and environmental policy experts here at RFF on March 14. This meeting is still uncertain, but I wanted to get it on your calendar now. I'm rushing to the airport, but will contact you next week with more details.
Also, can you get me Peter Merrill's contact info.
Thanks.
Ray

Ray Kopp
Senior Fellow
Director, Center for Climate and Electricity Policy
Resources for the Future
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USA
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fax: 1-202-939-3460
email: (b)(6) rff.org<(b)(6) @rff.org>
RFF: www.rff.org<http://www.rff.org>
Weathervane: www.weathervane.rff.org

From:	Metcalf, Gilbert
To:	"Hayes, Kristin"; "Billy Pizer (b)(6) @duke.edu)"; "(b)(6) @hks.harvard.edu"
Cc:	"Kopp, Ray"
Subject:	RE: Possible Carbon tax meeting at RFF 3/14
Date:	Tuesday, February 14, 2012 5:10:00 PM

It's on my calendar. Looking forward to it.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
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(202) 622-0173 (office)
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-----Original Message-----
From: Hayes, Kristin [(b)(6) @rff.org]
Sent: Tuesday, February 14, 2012 4:02 PM
To: Billy Pizer (b)(6) @duke.edu); Metcalf, Gilbert;(b)(6) @hks.harvard.edu
Cc: Kopp, Ray
Subject: RE: Possible Carbon tax meeting at RFF 3/14

Hi gentlemen,

I believe Ray Kopp has chatted with each of you (at least via e-mail) about attending a potential meeting of tax and environmental policy experts at RFF on March 14th, to discuss research around how a carbon tax might fit into fiscal policy reform.

While planning for that meeting is still in process, we're quite keen to move ahead with that date if possible - so if I can persuade you to hold that date just a bit longer, I'd appreciate it. We'll get back to you ASAP.

Many thanks,
Kristin Hayes
Manager, Center for Climate and Electricity Policy
(b)(6)

From: Metcalf, Gilbert
To: "(b)(6) @duke.edu"
Subject: Re: Possible Carbon tax meeting at RFF 3/14
Date: Tuesday, February 14, 2012 7:58:44 PM

If you want to come up the night before we can give you a bed.
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Billy Pizer (b)(6) @duke.edu]
Sent: Tuesday, February 14, 2012 06:40 PM
To: Hayes, Kristin (b)(6) @rff.org>; Metcalf, Gilbert; (b)(6) @hks.harvard.edu (b)(6) @hks.harvard.edu>
Cc: Kopp, Ray (b)(6) @rff.org>
Subject: RE: Possible Carbon tax meeting at RFF 3/14

I teach Wednesdays at 430pm. Possible I could fly up for something in the morning for a few hours, but unfortunately cannot miss class.

-----Original Message-----
From: Hayes, Kristin [(b)(6) @rff.org]
Sent: Tuesday, February 14, 2012 4:02 PM
To: Billy Pizer; Gilbert.Metcalf@treasury.gov; (b)(6) @hks.harvard.edu
Cc: Kopp, Ray
Subject: RE: Possible Carbon tax meeting at RFF 3/14

Hi gentlemen,

I believe Ray Kopp has chatted with each of you (at least via e-mail) about attending a potential meeting of tax and environmental policy experts at RFF on March 14th, to discuss research around how a carbon tax might fit into fiscal policy reform.

While planning for that meeting is still in process, we're quite keen to move ahead with that date if possible - so if I can persuade you to hold that date just a bit longer, I'd appreciate it. We'll get back to you ASAP.

Many thanks,
Kristin Hayes
Manager, Center for Climate and Electricity Policy
(b)(6)

From:	Metcalf, Gilbert
To:	(b) (6) @gmail.com"
Subject:	FW: carbon tax regressivity - World bank consultant. Exploring further research
Date:	Thursday, February 23, 2012 3:54:00 PM
Attachments:	Ravi Gupta Indpdt Study Carbon Tax Regressivity and Geographic variation- consolidated.pdf

Ravi,
I read your paper and would be happy to talk about it with you. Maybe on Tuesday or Wednesday of next week?
Best,
Gib

Gilbert E. Metcalf
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-----Original Message-----
From: Metcalf, Gilbert E. (b)(6) @tufts.edu]
Sent: Wednesday, January 18, 2012 10:19 AM
To: Metcalf, Gilbert
Subject: FW: carbon tax regressivity - World bank consultant. Exploring further research

_____
From: Ravi Gupta (b) (6) @gmail.com]
Sent: Wednesday, January 18, 2012 9:21 AM
To: Metcalf, Gilbert E.
Subject: RE: carbon tax regressivity - World bank consultant. Exploring further research

Thanks for your note. <<...>>

I am sending the paper I wrote. Please note that the paper was written as a term paper during grad school. Hence, it doesn't appear very polished. That is because, it was not my intention (initially) to get it published. The purpose of the paper was to get credit towards my degree. Hence the only intended audience was my teacher, (b) (6)

(b) (6)

The report was written under the guidelines and using the style that (b) (6) wanted, and not for any publication(external audience). The purpose was gaining an understanding of a subject (carbon taxes regressivity) and performing original computations and research. Hence to someone like you who is accustomed to reading published papers, the document may seem not as refined in terms of presentation. Of course, I would be a lot more politic, reword it, and present it more elegantly, if I were to get it published.

My teacher (b) (6) is not really interested in pursuing a publication as it doesn't fit in his research agenda. The entire work is mine. (b) (6) had just told me the topic and said "since BSW

have used CEX, why don't you use RECS and compare/contrast your results".

I showed the paper to my colleagues at the World Bank where I consult on innovation topics and they suggested that the work is very good and original and potentially someone like McKinsey or CBPP may be interested in working with me and pursue a publication or develop the work further. My first reaction was to of course approach (b) (6) and ask his permission. (b) (6) said that while I must pursue publication, he (b) (6) would not have the time for it not does it fit into his immediate research agenda. So he said " if you publish you would simply thank me (b) (6) for "helpful conversations" or something like that in an acknowledgments footnote."

Hence I wish to speak to you, and take it from there. I am also trying to get in touch with other think tanks and private organizations.

My objective is to do a paid assignment and further this research and get it published. I am not going to work for its publication on my own.

The objective of my conversation with you would be:

1. potentially explore working further on the paper 2. Discuss other possible research engagements on carbon finance where you believe my research on carbon taxes could be helpful.

Let me know if you need any more information.

Sincerely,

Ravi Gupta

(b)(6)

Cell: (b) (6)

Skype: (b) (6)

-----Original Message-----
From: Metcalf, Gilbert E. [(b)(6) @tufts.edu]
Sent: Wednesday, January 18, 2012 7:32 AM
To: Ravi Gupta
Subject: RE: carbon tax regressivity - World bank consultant. Exploring further research

Ravi,

I'm on leave from Tufts at US Treasury but would enjoy seeing your paper. Could you send a copy. Happy to talk after taking a look.

Best,

Gib

From: Ravi Gupta [(b) (6) @gmail.com]

Sent: Tuesday, January 17, 2012 6:51 PM

To: Metcalf, Gilbert E.

Subject: carbon tax regressivity - World bank consultant. Exploring further research

Hello Prof Metcalf,

Hope you are doing well. I am a consultant at the world bank. I am writing to explore if you would find some of my work on regressivity of carbon taxes, relevant to your current research.

I have conducted some research on carbon tax regressivity in the US based on RECS data (the first such study as other studies have used CEX data) and have come up with some interesting findings. The study was done as part of coursework to get credit for my graduate degree ie I haven't (yet) worked for its publication.

Below a synopsis of my study . if you find it interesting and relevant to your research, maybe we should talk.

Thanks.

**********Synopsis of carbon tax regressivity research**********

A.M. (PUBLIC POLICY) PROJECT AT THE UNIVERSITY OF CHICAGO

Mar '11 – May '11 , Regressivity and geographical variation of carbon taxes using RECS data, Chicago, IL

Researched the regressivity and geographical variation of carbon taxes using the Suits index and RECS (Residential Energy Consumption Survey) data. The study investigated the impact of different policy prescriptions (cap and dividend, EITC, heating assistance etc) to ameliorate regressivity of carbon taxes. The paper consisted of two parts. The first was actual computations of regressivity using RECS data; this part covered many policy alternatives covered by the Burtraw Sweeney and Walls (BSW) paper "The Incidence of U.S.Climate Policy Where You Stand Depends on Where You Sit". The second part was literature critique of various papers on topics related to carbon taxation regressivity. The BSW paper was based on CEX (Consumer Expenditure) data. For my study, the RECS data was used. Till date there is no published study on carbon tax regressivity using RECS data. In fact the RECS data to my knowledge has not been used in any study related to energy or carbon taxes.

The paper:

- Provided a comprehensive understanding of various techniques, methods and data sets used to study the regressivity of carbon taxes and related policy issues.

- Developed an understanding of prominent issues related to carbon tax regressivity and investigating those issues using RECS data.

- Developed a comprehensive list of policy alternatives for carbon taxation (such as the EU emissions scheme which excludes transportation and fuel used for heating) and policies to equitably distribute the revenues obtained from taxation.

- Investigated the tradeoff between efficiency and regressivity under different taxation regimes.

- Compared and contrasted various policy alternatives depending of criteria such as regressivity, ease of administration etc.

- Provided insights into issues related to overall tax burden regressivity, and amelioration policies that would be least distortionary.

**********end of synopsis**********

Sincerely,

Ravi Gupta

(b)(6)

Cell: (b) (6)

Skype: (b) (6)

From:	Metcalf, Gilbert
To:	"Kopp, Ray"
Subject:	RE: Invitation to March 14 carbon tax experts meeting
Date:	Tuesday, February 28, 2012 10:56:00 AM

How about Nat Keohane? I flagged this for Mark Mazur here in Tax Policy. He is even more circumspect than I am given that he's up for confirmation as Asst. Sec'y for Tax Policy. If he shows interest, I'll flag that for you. You could, of course, just go ahead and invite him directly.

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-----Original Message-----
From: Kopp, Ray (b)(6) @rff.org]
Sent: Tuesday, February 28, 2012 10:48 AM
To: Metcalf, Gilbert
Subject: RE: Invitation to March 14 carbon tax experts meeting

Gib,
I'm going to invite Rick Duke (DOE) from Sandalow's office. Other Gov type I should invite? Other smart folks generally?
Ray

-----Original Message-----
From: Gilbert.Metcalf@treasury.gov [mailto:Gilbert.Metcalf@treasury.gov]
Sent: Tuesday, February 28, 2012 10:20 AM
To: Kopp, Ray
Cc: Hayes, Kristin
Subject: RE: Invitation to March 14 carbon tax experts meeting

Ray,
I've blocked out the time. I'll have to be a bit circumspect about Treasury activities obviously but I think this can be quite productive. Are you inviting other folks from the Administration?
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Kopp, Ray [(b)(6) @rff.org]
Sent: Tuesday, February 28, 2012 9:28 AM
To: Metcalf, Gilbert
Cc: Hayes, Kristin
Subject: Invitation to March 14 carbon tax experts meeting

Hi Gib,
Below is the formal invite to the March experts meeting at RFF I talked to you about a few weeks ago If

you are able to talk about the work Treasury is doing we would love to hear it.
I'm putting together the full invitation list now and will send it along soon.
See you in two weeks.
Ray

# # #

After the elections the new Congress will be struggling with fiscal issues. While cuts to entitlement spending will occupy a good deal of the political space, there is good reason to believe there will be an equally vigorous discussion about reforms to the federal tax code in an effort to close "loopholes" (i.e., trim deductions), reorient the burden of the taxing system by lowering rates, and to deal with the expiring Bush era tax cuts, the Alternative Minimum Tax and the current cuts in payroll taxes. Everyone agrees reforming the tax code is made a good deal easier if there is an additional source of revenue. The need for a non-trivial revenue stream (perhaps $100-150 billion annually) to grease the tax reform wheels opens the door for the introduction of a tax on carbon dioxide emissions.

We are hoping you will join a meeting at RFF on March 14. The meeting will gather experts who can undertake research and analysis that would inform the development of a federal carbon tax policy. Most of the experts attending the meeting will be DC-based, but a few experts wiling to travel have been invited as well. The purpose of the meeting is to continue developing a shared understanding of the carbon tax work currently underway and to establish lines of communication among all the relevant individuals and institutions working on analysis in this area.

The meeting is designed to be quite informal and to facilitate an open exchange of information. Brief self-introductions will be followed by a round-robin presentation of carbon tax relevant work currently underway, planned, or possible (time and funding available). For example, RFF presentations would touch on current work on the role of carbon taxes in the context of deficit reduction, planned carbon tax simulations using our Haiku electricity model, and some possible work on the distributional impacts (household and sectoral) of a carbon tax. Time permitting, the meeting would turn to a discussion of the relevant carbon tax issues and questions that are not on the current or planned agendas of the assembled experts and their respective institutions, and a discussion of how those gaps might be filled. The meeting will begin at 10:00 AM in the 7th floor conference room at RFF (1616 P Street NW) and continue through a working lunch ending no later than 2:00 PM. RFF will develop a summary report for meeting participants describing the ongoing activities and the gaps in analysis the group believes require attention going forward.
I hope you can join us for this meeting and look forward to receiving your acceptance of this invitation. If you have any questions or concerns, please do not hesitate to contact me. Also, please bring with you copies of any existing analysis you believe to be relevant the discussion.

Ray Kopp
Senior Fellow
Director, Center for Climate and Electricity Policy Resources for the Future
1616 P Street NW
Washington, DC 20036
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fax: 1-202-939-3460
email: (b) @rff.org<mailto:(b) (6) @rff.org>
RFF: www.rff.org<http://www.rff.org>
Weathervane: www.weathervane.rff.org

From:	Metcalf, Gilbert
To:	Mazur, Mark
Subject:	RE: Invitation to March 14 carbon tax experts meeting
Date:	Tuesday, February 28, 2012 11:03:00 AM

Ray Kopp is going to invite you directly and you can ask if Curtis can attend in your place. Would be helpful to have him there in my view.

Gilbert E. Metcalf
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(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Mazur, Mark
Sent: Tuesday, February 28, 2012 11:02 AM
To: Metcalf, Gilbert
Subject: RE: Invitation to March 14 carbon tax experts meeting

Gib,
I was not planning on going, but this looks like something that might be interesting to Curtis. Would it make sense to see if he wanted to go?
Mark

-----Original Message-----
From: Metcalf, Gilbert
Sent: Tuesday, February 28, 2012 10:18 AM
To: Mazur, Mark
Subject: FW: Invitation to March 14 carbon tax experts meeting

Mark,
I plan to attend this. (b) (5) Are you interested in participating? I can ask Ray to add you to the list (or you can contact him directly).
Gib

Gilbert E. Metcalf
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Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Kopp, Ray (b)(6) @rff.org]
Sent: Tuesday, February 28, 2012 9:28 AM
To: Metcalf, Gilbert
Cc: Hayes, Kristin
Subject: Invitation to March 14 carbon tax experts meeting

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I'm putting together the full invitation list now and will send it along soon.
See you in two weeks.
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Ray Kopp
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Director, Center for Climate and Electricity Policy Resources for the Future
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RFF: www.rff.org<http://www.rff.org>
Weathervane: www.weathervane.rff.org

From: Metcalf, Gilbert
To: "Billy Pizer"
Subject: RE: including you on ASSA/AERE session proposal--panel on US carbon tax
Date: Wednesday, March 14, 2012 3:13:00 PM

Ok. so where I recall seeing you on panels it was after you left Treasury?

Good advice.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
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(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Billy Pizer (b)(6) @duke.edu]
Sent: Wednesday, March 14, 2012 3:12 PM
To: Metcalf, Gilbert
Subject: RE: including you on ASSA/AERE session proposal--panel on US carbon tax

It is hard to do something like this and be viewed as not reflecting USG thinking at some level. I gave one talk, in Europe, while I was at Treasury that was not 100% official business. And even that was sort of my top ten areas of climate economic research, so fairly vague and innocuous. I would generally avoid something like this.

My one thought is that you might agree if Ian is willing to sub you out later depending on how things unfold. The only thing you would have to worry about now is the AEA program coming out sometime in the fall and whether this would attract any attention. "Obama plans carbon tax!" Or you could not be on the program but sub you IN later depending on how things unfold.

-----Original Message-----
From: Gilbert.Metcalf@treasury.gov [mailto:Gilbert.Metcalf@treasury.gov]
Sent: Wednesday, March 14, 2012 2:58 PM
To: Billy Pizer
Subject: FW: including you on ASSA/AERE session proposal--panel on US carbon tax

Billy,
What was your approach on things like this when you were here. I'll check internally, of course, but it seems to me that it makes more sense to be part of a panel with other USG officials. Any views?

DC is lovely right now.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Parry, Ian [(b)(6) @imf.org]
Sent: Wednesday, March 14, 2012 2:38 PM

To: Lawrence Goulder (b)(6) @stanford.edu); Metcalf, Gilbert
Subject: including you on ASSA/AERE session proposal--panel on US carbon tax

Hi Gib and Larry

Would it be OK to include you as panelists in this session proposal for AERE/ASSA San Diego meetings, Jan 4-6?

If so do you have any suggestions for improving the proposal before I try to entice the other two panelists.

Thanks for any help.

Best

Ian

Ian Parry
Technical Assistance Advisor (Climate Change and Environment) Tax Policy, Fiscal Affairs Department
International Monetary Fund 700 19th Street NW, Washington, DC 20431

E-mail: (b)(6)@imf.org
Phone: (b) (6)
web: http://ideas.repec.org/f/ppa261.html

From:	Metcalf, Gilbert
To:	"Kopp, Ray"
Cc:	"Morris, Daniel"; "Hayes, Kristin"
Subject:	RE: March 14. 2012 Experts meeting held at RFF
Date:	Tuesday, April 24, 2012 2:12:00 PM

Ray,
No attribution for Treasury please. We are not working on this issue in any official capacity.
Thanks.
Gib

Gilbert E. Metcalf
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U.S. Department of the Treasury
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-----Original Message-----
From: Kopp, Ray [(b)(6) @rff.org]
Sent: Monday, April 23, 2012 2:51 PM
To: Metcalf, Gilbert
Cc: Morris, Daniel; Hayes, Kristin
Subject: March 14. 2012 Experts meeting held at RFF

Gib,
Below is our summary of the research/interests you provided to the group at the March 14. 2012 Experts meeting held at RFF to discuss the role of a carbon tax in the development of fiscal policy. At the beginning of the meeting I stated that RFF would produce a summary of the meeting without attribution. Having now drafted the summary, I believe it is valuable to know which people and institutions are doing which work and possess which interests. I therefore would like to attach names. Please let me know if you agree to have you name and affiliation attached to your remarks. I'd like to get this out very soon, so a rapid response from you would be greatly appreciaited.
Thanks
Ray

Gib Metcalf (Department of the Treasury):

- He notes that what Ian referred to as "squandering" the revenue is what some consider the necessary trade-off for getting legislation passed.

- One of his main questions is what sorts of policy combinations are most useful for building political coalitions.

- He notes that there is a group already established looking at the tax side, and Gib has a few names he recommends.

Ray Kopp
Senior Fellow
Director, Center for Climate and Electricity Policy
Resources for the Future
1616 P Street NW
Washington, DC 20036
USA

voice: (b)(6)
fax: 1-202-939-3460
email: (b) @rff.org(b)(6) @rff.org>
RFF: www.rff.org<http://www.rff.org>
Weathervane: www.weathervane.rff.org

From: Metcalf, Gilbert
To: (b) @rff.org"; (b) (6) @us.pwc.com"
Subject: Re: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis
Date: Tuesday, May 01, 2012 10:22:22 AM

Copied here
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Kopp, Ray [(b)(6) @rff.org]
Sent: Tuesday, May 01, 2012 10:07 AM
To: Metcalf, Gilbert
Cc: Hayes, Kristin (b)(6) @rff.org>
Subject: RE: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis

Hi Gib,
Can you resent contact info for Peter Merrill?
Thanks
Ray

_____
From: Hayes, Kristin
Sent: Tuesday, May 01, 2012 9:43 AM
To: Kopp, Ray
Subject: FW: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis

Hmmm...no luck getting through to Peter Merrill. Any chance Gib passed on a phone number for him? Have you had any luck reaching him via e-mail?

_____
From: Microsoft Outlook
Sent: Tuesday, May 01, 2012 9:43 AM
To: Hayes, Kristin
Subject: Undeliverable: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis

Delivery has failed to these recipients or groups:

(b) (6) @us.pwcglobal.com
(b) (6) @us.pwcglobal.com)<mailto:(b) (6) @us.pwcglobal.com>
A problem occurred during the delivery of this message to this e-mail address. Try sending this message again. If the problem continues, please contact your helpdesk.

The following organization rejected your message: Postini.

Diagnostic information for administrators:

Generating server: RFF-MAIL1.rff.org

(b) (6) @us.pwcglobal.com< mailto:(b) (6) @us.pwcglobal.com>
Postini #550 Host not found for domain:us.pwcglobal.com - psmtp ##

(NR)

From: Metcalf, Gilbert
To: (b) @rff.org"
Cc: '(b) @rff.org"
Subject: Re: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis
Date: Tuesday, May 01, 2012 10:23:41 AM

That email is all I have. I'll see if I have a phone number anywhere.
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Kopp, Ray (b)(6) @rff.org]
Sent: Tuesday, May 01, 2012 10:07 AM
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(b) (6) @us.pwcglobal.com< mailto(b) (6) @us.pwcglobal.com>
Postini #550 Host not found for domain:us.pwcglobal.com - psmtp ##

(NR)

From: Metcalf, Gilbert
To: "Hayes, Kristin"
Subject: RE: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis
Date: Tuesday, May 01, 2012 12:57:00 PM

Kristin,
I will plan to attend or send someone from the office.
Thanks.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
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Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Hayes, Kristin (b)(6) @rff.org]
Sent: Tuesday, May 01, 2012 9:29 AM
To: Kopp, Ray
Subject: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis

Dear all,

Following our successful first meeting in March, we'd like to convene a second meeting of experts in carbon tax analysis on May 16th, from 9 - 11 AM in RFF's First Floor Conference room. Breakfast will be available from 8:30 on.

Per our discussions about featuring new research as it becomes available, this meeting will highlight a new piece of RFF research coming out this week on the variability of potential revenue from a carbon tax (see description below). If others have new/specific research they'd like to highlight, please let me know so we can include that in this or future meetings.

Also, we've created a password-protected website that will house all the information related to RFF's Expert Engagement series. To access the site, visit https://sites.google.com/a/rff.org/carbon-tax-expert-engagement/, click the (very) small "Sign In" link on the bottom, and sign in using login: ccep@rff.org<mailto:ccep@rff.org>, password: carbontax. This will allow you to access all the information available on the site. If you have questions, or publications you'd like to post, feel free to let me know.

Please let me know if you're able to make it, and we hope to see you on the 16th.

Thanks,
Kristin Hayes

Center Manager, CCEP<http://www.rff.org/ccep> Resources for the Future
1616 P Street NW
Washington, DC 20036
(b)(6) @rff.org<m(b)(6) @rff.org>
office (b)(6)

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In a new issue brief The Variability of Potential Revenue from a Carbon Tax, RFF researchers show that carbon tax revenues from the electricity sector are notably uncertain, based not only on the level of tax

but also on several market conditions beyond the price of carbon itself. These include forecasted levels of natural gas prices and electricity demand, both of which have changed significantly in the past few years.

Karen Palmer, Anthony Paul and Matt Woerman use RFF's Haiku model to analyze potential carbon tax revenues under a range of assumptions, including carbon tax rates of $10, $25 and $40 per ton. They find that carbon tax revenues from the electricity sector and for the economy will vary substantially with tax rates, and revenues are uniformly lower when natural gas is less expensive and when demand growth is lower. In addition, the effect of these factors gets bigger the higher the carbon tax rate.

Under a carbon tax of $25 per ton in 2020, for example, revenues from the electricity sector can vary by roughly 18 percent and total carbon tax revenues can vary by up to 7 percent. With the higher $40 tax trajectory, tax revenues vary by as much as $25 billion per year, which is equal to roughly 30 percent of total annual tax revenue in the electricity sector. These variations are important to keep in mind as analysts and policymakers consider deficit reduction and revenue raising goals.

Finally, the political economy of a carbon tax proposal will depend importantly on what happens to electricity prices locally. Palmer, Paul and Woerman's analysis suggests that some of the regions that have low electricity prices currently will tend to be the hardest hit, in part because of their heavy reliance on coal. Nonetheless, for moderate carbon tax rates, these regions will continue to have low electricity prices, and the carbon tax tends to reduce existing price differences across the regions.

From:	Metcalf, Gilbert
To:	Jaffe, Judson; Hall, Daniel
Subject:	Re: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis
Date:	Tuesday, May 01, 2012 1:34:32 PM

(b) (5) [redacted]

Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Jaffe, Judson
Sent: Tuesday, May 01, 2012 01:02 PM
To: Metcalf, Gilbert; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth)
Subject: RE: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis

(b) (5) [redacted]

Jud

_____
Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

-----Original Message-----
From: Metcalf, Gilbert
Sent: Tuesday, May 01, 2012 12:58 PM
To: Jaffe, Judson; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth)
Subject: FW: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis

See website below. We should coordinate about attending the event.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----

From: Hayes, Kristin [(b)(6) s@rff.org]
Sent: Tuesday, May 01, 2012 9:29 AM
To: Kopp, Ray
Subject: May 16 at RFF - next Expert Engagement Meeting on Carbon Tax Analysis

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Also, we've created a password-protected website that will house all the information related to RFF's Expert Engagement series. To access the site, visit https://sites.google.com/a/rff.org/carbon-tax-expert-engagement/, click the (very) small "Sign In" link on the bottom, and sign in using login: ccep@rff.org<mailto:ccep@rff.org>, password: carbontax. This will allow you to access all the information available on the site. If you have questions, or publications you'd like to post, feel free to let me know.

Please let me know if you're able to make it, and we hope to see you on the 16th.

Thanks,
Kristin Hayes

Center Manager, CCEP<http://www.rff.org/ccep> Resources for the Future
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office(b)(6)

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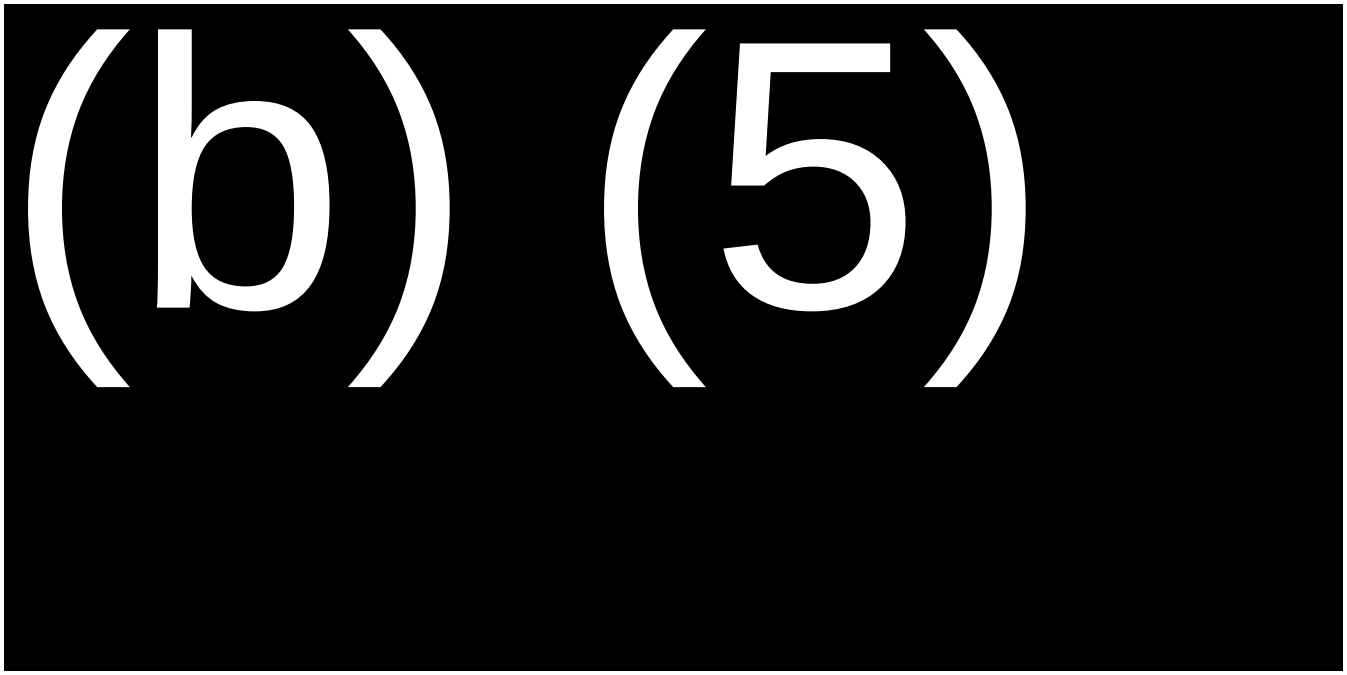
electricity prices, and the carbon tax tends to reduce existing price differences across the regions.

From: Jaffe, Judson
To: Metcalf, GilbertDisabled
Cc: Hall, Daniel
Subject: Revenue Offsets from Carbon Charge
Date: Thursday, May 03, 2012 11:02:41 AM
Attachments: 5-15-waxmanletter[1].pdf



CONGRESSIONAL BUDGET OFFICE
U.S. Congress
Washington, DC 20515

Douglas W. Elmendorf, Director

May 15, 2009

Honorable Henry A. Waxman
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

The potential introduction of carbon cap-and-trade policies raises complicated questions about how those policies might be reflected in the federal budget. In response to such questions, the Congressional Budget Office (CBO) has prepared the enclosed description of how it plans to assess those budgetary impacts. Federal legislation to limit the emission of greenhouse gases (GHGs) through the issuance of tradable allowances effectively would create a new type of financial instrument of significant value and liquidity. The document explains CBO's view that the value of such allowances—whether auctioned or freely distributed—should be recorded on both the revenue and outlay sides of the federal budget. It also describes CBO's position regarding the circumstances in which net revenue from the allowances would be less than the value of the allowances themselves because of a so-called "revenue offset." The examples used to illustrate various possible budgetary outcomes involve electric generating companies and local distribution companies (LDCs), which have been a focus of your and other policymakers' recent discussions.

I hope this information is helpful to you. If you have any questions or concerns, I would be happy to discuss them with you. The CBO staff contacts on this subject are Frank Sammartino, who can be reached at 226-2680, and Theresa Gullo, who can be reached at 226-2800.

Sincerely,

Douglas W. Elmendorf

Enclosure

cc: Honorable Joe Barton
Ranking Member

Congressional Budget Office

The Budgetary Treatment of Emission Allowances Under Cap-and-Trade Policies

The potential introduction of carbon dioxide cap-and-trade policies raises complicated questions about how those policies might be reflected in the federal budget. Federal legislation to limit the emission of greenhouse gases (GHGs) through the issuance of tradable allowances effectively would create a new type of financial instrument of significant value and liquidity. This letter explains the Congressional Budget Office's (CBO's) view that the value of such allowances—whether auctioned or freely distributed—should be recorded on both the revenue and outlay sides of the federal budget. The letter also describes CBO's position regarding the circumstances in which the government's net revenues from the allowances would be less than the value of the allowances themselves because of a so-called revenue offset. The examples used to illustrate various possible budgetary outcomes involve electric generating companies and local distribution companies (LDCs), which have been a focus of policymakers' recent discussions.

Tradable Emission Allowances and the Federal Budget

When considering the appropriate budgetary treatment for new federal activities, CBO relies heavily on the guidance provided by the 1967 *Report of the President's Commission on Budget Concepts*. The commission recommended that the federal budget be "comprehensive of the full range of federal activities. Borderline agencies and transactions should be included in the budget unless there are exceptionally persuasive reasons for exclusion."

Clearly, federal efforts to control GHG emissions through a cap-and-trade system would be promulgated and enforced through the government's sovereign powers and would alter the usage of scarce economic resources. Under recent cap-and-trade proposals, the federal government would determine both the scope of covered emissions and the number of allowances to be issued. Moreover, the allowances would be traded in a large and liquid secondary market, which would make them "cash-like" in nature.

Under those circumstances, the distribution of allowances by the federal government would be essentially equivalent to the distribution of cash grants, so CBO believes that such distributions should be treated as outlays. At the same time, allowances in a cap-and-trade system would be valuable financial instruments, so CBO thinks that the creation of allowances by the federal government should be recorded as revenues.

That logic does not hinge on whether the federal government sells or, instead, gives away the allowances. Allowances would have significant value even if given away because the recipients could sell them or, if they are carbon dioxide emitters, use them to avoid incurring the cost of purchasing allowances or investing in costly emission mitigation mechanisms. Therefore, selling the allowances and giving entities cash, and giving

entities the allowances themselves and letting the entities realize their value, are essentially the same transaction. Sound budgeting requires that the budget treat equivalent transactions in the same way.

Consider the following examples. In each, an electric generating company is allowed to generate $100 worth of emissions, an LDC receives $100 in cash, and the government's financial position is unchanged (except for subsequent indirect effects on tax collections, as discussed below):

- The government sells a $100 allowance to an electric generating company and gives the money to an LDC.

- The government imposes an emission tax of $100 on an electric generating company and gives the money to an LDC.

- The government gives a $100 allowance to an LDC, which sells it to an electric generating company for $100.

In the first and second examples, the government budget would clearly show an additional $100 in revenues and $100 in outlays. Because the third example is an equivalent transaction, it should be recorded the same way in the budget.

Some might question why the cap-and-trade method of regulating emissions should warrant inclusion in the federal budget, while other methods such as directly controlling GHGs through requiring the use of different technology or mitigation systems would not. A fundamental difference is that cap-and-trade systems create cash-like assets whose supply is determined by the government, while command-and-control approaches do not.

Potential Offsets to Revenues from Emission Allowances

Under cap-and-trade proposals, the cost of purchasing emission allowances would become an additional business expense for companies that must comply with the cap. These additional expenses could result in decreases in taxable income somewhere in the economy, which could produce a loss in government revenue that would partially offset the revenue from the allowances themselves.[1]

Consider an electricity generator that purchases $100 worth of allowances from the federal government:

- If the generator could not pass that expense on to its customers, its profits and therefore taxable income would decline by $100. On average, the tax on additional income (across businesses and households) is roughly 25 percent. By long-standing convention, CBO, the Joint Committee on Taxation, and the

[1] For a further explanation of revenue offsets, see Congressional Budget Office, *The Role of the 25 Percent Revenue Offset in Estimating the Budgetary Effects of Legislation* (January 13, 2009), available at http://www.cbo.gov/ftpdocs/96xx/doc9618/01-13-25PercentOffset.pdf.

Treasury Department would apply that 25-percent tax rate to the $100 income decline and estimate that income and payroll tax revenue would fall by $25. This "revenue offset" means that the net additional revenues collected under the cap-and-trade system would be $100 minus $25, or $75.

- Alternatively, if the generator could pass that expense on to its customers by raising prices, its profits would be unchanged. However, since consumers would spend $100 more on electricity due to the higher prices, they would have $100 less to spend on other goods. As a result, the profits and wages received by producers of those other goods would fall by $100. Again, that drop of $100 in taxable income would reduce the federal government's tax receipts by $25 and net additional revenues under the cap-and-trade system to $75.

The situation is complicated further because cap-and-trade proposals often include provisions to return some or all of the proceeds from the sale of emission allowances to individuals and businesses. Depending on the manner in which the proceeds are conveyed to private entities, the reduction in taxable income in the preceding examples (the "revenue offset") might be accompanied by a matching increase in taxable income elsewhere in the economy. In these cases, CBO would view the distribution of the allowance proceeds as creating an "offsetting offset" that would compensate for the initial loss of tax revenues from the sale of the allowances and make the net revenue from that sale equal to the value of the allowances themselves. (Although it may appear that this terminology is deliberately confusing, it is chosen to be consistent with the long-standing treatment of revenue offsets.)

Again, some examples may help illuminate the situation:

- If the government took $100 received from selling allowances and gave it to a taxable entity in a manner that increased its taxable income, that higher income would generate $25 in additional tax revenue. The tax receipts gained through this method of "recycling" of the auction revenue would equal the $25 tax loss created when generators needed to purchase allowances from the government. The revenue offset would have an offsetting offset, so the net change in revenue would be the $100 gained from selling allowances. (The net change in the government's outlays would also be $100, and the outcome would not affect the budget deficit.)

- If the government took $100 received from selling allowances and gave it away in a manner that did not increase some entity's taxable income, there would be no gain in tax revenue to offset the $25 decrease in tax collections caused by the added cost to generators. The net revenue offset would be $25, and the government's net revenue gain from the sale and distribution of allowances would be $75. (Outlays would rise by $100.) Examples of government uses of the money that would not increase taxable incomes include:

    - Revenue given to non-taxable entities, such as low-income households.

- Direct government expenditures of $100 on goods and services, such as research and development, or weatherization projects. Under the assumption governing CBO budget estimates that legislation does not affect the size of the economy—a topic to which we return shortly—the government's purchases of goods and services would displace other spending in the economy and would not cause a net increase in income.

- Revenue given to other entities with instructions that they use it in particular ways, such as for research and development or weatherization projects. This approach would be equivalent to the government paying for those items directly.

Fixed Nominal GDP and Revenue Offsets

It may seem inconsistent that providing money to businesses or households in certain ways—such as taxable transfers—is assumed to raise overall taxable income, but that providing money to them in other ways—such as purchases of goods—does not. Yet, this result is consistent with long-standing budget conventions and economic logic.

When CBO estimates the effect of proposed legislation on revenues and outlays, it assumes that the legislation would not affect nominal or real (inflation-adjusted) gross domestic product (GDP). One reason for this assumption is that the effects of legislation on overall economic output and prices are quite uncertain and depend upon the underlying level of economic activity. If the economy is at full employment, additional spending may primarily increase prices, but if there is slack in the economy, additional spending may increase real employment and earnings. (In the former case, assessing the full budgetary impact of a proposal would require estimates of the effect of higher prices on outlays through entitlement programs and on discretionary outlays that aimed to support government programs at a given inflation-adjusted level.) In addition, the effect of legislation on the economy depends on the policy of the Federal Reserve, which is trying to stabilize economic activity and keep inflation low. The Fed might respond to legislation that tended to change nominal GDP in a manner that kept the economy close to the same level of output and prices. Another reason for the assumption of fixed GDP is to maintain consistency across the treatment of different legislation. If assumptions about the underlying level of economic activity were constantly changing as legislation was introduced and enacted, the cost of proposals would depend upon whether other legislation had already been introduced.

Further Examples of Revenue Offsets for Emission Allowances

In CBO's view, giving away allowances is equivalent, in economic and budgetary terms, to selling them and giving away the proceeds. Therefore, the concepts of "revenue offsets" and "offsetting offsets" also apply to transactions involving the distribution of allowances at no cost. Further examples below illustrate how CBO would estimate the budgetary impact of giving away cap-and-trade emission allowances. These examples involve giving away allowances to electricity generators and local distribution

companies. In all of these examples, electricity generators are assumed to need $100 of allowances to cover their emissions.

In some cases, the revenue offset caused by the issuance of allowances would have an offsetting offset, which means that the revenue from the allowances would equal $100, the value of the allowances themselves, and the overall proposal would be budget neutral ($100 in revenues versus $100 in outlays for giving away the allowances). Examples include:

- Allowances worth $100 are given to LDCs, which sell the allowances to electricity generators and use the proceeds to counteract the price increases that consumers would otherwise face. Counteracting the price increases can take the form of reductions in the charges per kilowatt-hour of electricity or a fixed-dollar credit or rebate on the electricity bill. In that case, generators would increase their electricity prices to reflect the cost of the allowances and therefore have no change in their taxable income. The LDCs would have no net change in their income, and consumers would face the same total cost of electricity as before the proposal was enacted. Overall taxable income would be unaffected by the policy.

- Allowances worth $100 are given to generators of electricity that operate in markets where pricing is governed by competitive forces (rather than by regulation). The cap on emissions would increase the marginal cost to some producers of generating electricity, and the marginal cost of the highest-cost producer is what determines prices in a competitive market; therefore, generators in competitive markets could sell electricity at a higher price. The generators' profits would be $100 higher because they received the allowances for free but were able to raise their prices, but consumers would have $100 less to spend on other goods and services, leading to $100 less taxable income somewhere in the economy. Again, overall taxable income would be unaffected by the policy.

In other cases, the revenue offset caused by the issuance of allowances would not have an offsetting offset, which means that the net revenue from the allowances would be $75, less than the value of the allowances themselves, and the overall proposal would not be budget neutral (yielding $75 in net revenues versus $100 in outlays for giving away the allowances). An example is:

- Allowances worth $100 are given to LDCs, which sell the allowances to electricity generators and use the proceeds to finance household weatherization projects. Because this case is especially complex, we first discuss the effects apart from the weatherization projects and then discuss the effects of those projects.

  Leaving aside the weatherization projects, generators would increase their electricity prices to reflect the cost of the allowances and have no change in their taxable income. The LDCs also would see no net change in their income. However, consumers' electricity expenditures would increase by $100, so they would spend less on other goods and services, leading to $100 less taxable income

somewhere in the economy. Nominal GDP would be unchanged through this substitution: More GDP in the electricity sector because of higher prices, and less in other sectors through lower prices there. But taxable income would decline by $100, and tax revenues would fall by $25.

The remaining piece is the extra spending on weatherization projects by the LDCs. This is assumed, by the logic described above, to be offset by lower spending on something else to keep nominal GDP unchanged, so that spending would induce no change in overall taxable income. Thus, the reduction in taxable income due to the higher electricity prices would be the only change affecting tax receipts, and federal revenues would fall by $25.

One might argue that this example is similar to the previous example in which the LDCs kept consumers' electricity prices from rising (and in which federal revenues did not fall) because both involve giving resources back to consumers. However, this example differs from the earlier one due to the increase in electricity prices that, by the assumption of fixed nominal GDP, must be offset by lower spending elsewhere in the economy. Put differently, making resources available for other spending is not comparable in its effect on overall output and income to preventing a price increase for existing spending.

These examples are conceptual in nature. CBO's determination of the net budgetary consequences of a cap-and-trade program would depend on the specific language of proposed legislation. If legislation allocated allowances to LDCs but did not provide explicit instructions about the use of the revenue from selling the allowances, then CBO would make a judgment call about the likely use of the revenue. To inform that judgment, CBO would consult with LDCs and their regulators to gain a better understanding of how they would probably proceed under those circumstances. Based on those consultations, CBO would estimate what fraction of the allowance receipts would be spent in ways that would result in a budget-neutral outcome (that is, an increase in income and payroll tax collections that would offset the loss of tax revenues from the issuance of the allowances) and what fraction would be spent in ways that did not result in an increase in other tax collections and thus would not be budget neutral.

May 15, 2009

From: Jaffe, Judson
To: Metcalf, GilbertDisabled
Subject: RE: Revenue Offsets from Carbon Charge
Date: Friday, May 04, 2012 9:42:00 AM

Go to: http://www.eia.gov/oiaf/aeo/tablebrowser/

Choose "AEO 2011" in the Publication drop-down list. On the right you'll then see all the AEO2011 cases, including the GHG pricing one "GHG price economywide".

_____
Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

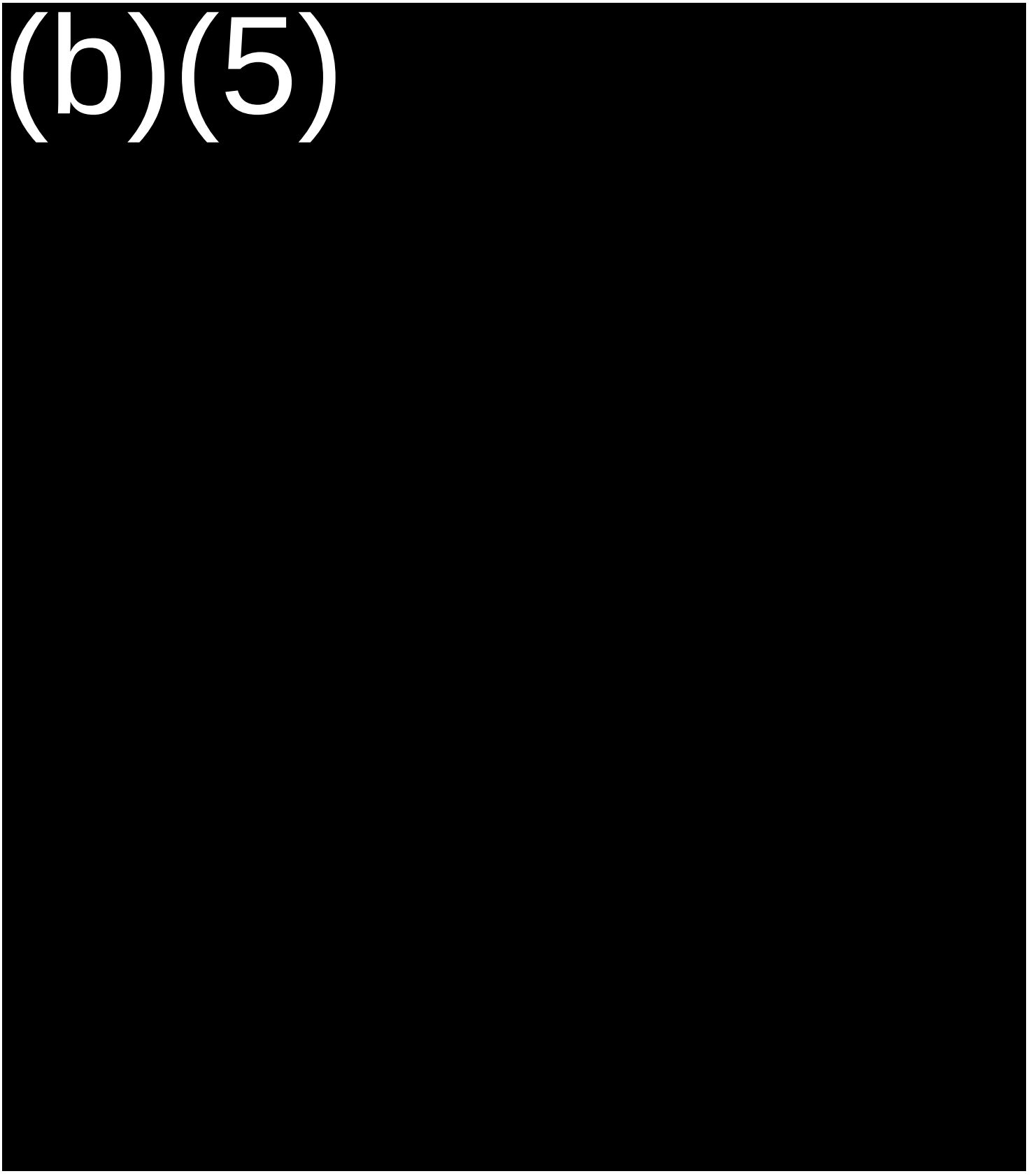
-----Original Message-----
From: Metcalf, Gilbert
Sent: Friday, May 04, 2012 9:41 AM
To: Hall, Daniel; Jaffe, Judson
Subject: RE: Revenue Offsets from Carbon Charge

Daniel,
Is the AEO2011 side-case for carbon pricing on EIA's website somewhere? I don't see it (though it is referenced) in the AEO2011 report. Can you point me to it?

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Hall, Daniel
Sent: Thursday, May 03, 2012 12:21 PM
To: Jaffe, Judson; Metcalf, Gilbert
Subject: RE: Revenue Offsets from Carbon Charge

(b) (5) [redacted]


(b)(5)

From: Metcalf, Gilbert
To: Jaffe, Judson
Cc: Hall, Daniel
Subject: RE: Revenue Offsets from Carbon Charge
Date: Friday, May 04, 2012 9:44:00 AM

Got it. thanks.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Jaffe, Judson
Sent: Friday, May 04, 2012 9:43 AM
To: Metcalf, Gilbert
Subject: RE: Revenue Offsets from Carbon Charge

Go to: http://www.eia.gov/oiaf/aeo/tablebrowser/

Choose "AEO 2011" in the Publication drop-down list. On the right you'll then see all the AEO2011 cases, including the GHG pricing one "GHG price economywide".

_____

Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

-----Original Message-----
From: Metcalf, Gilbert
Sent: Friday, May 04, 2012 9:41 AM
To: Hall, Daniel; Jaffe, Judson
Subject: RE: Revenue Offsets from Carbon Charge

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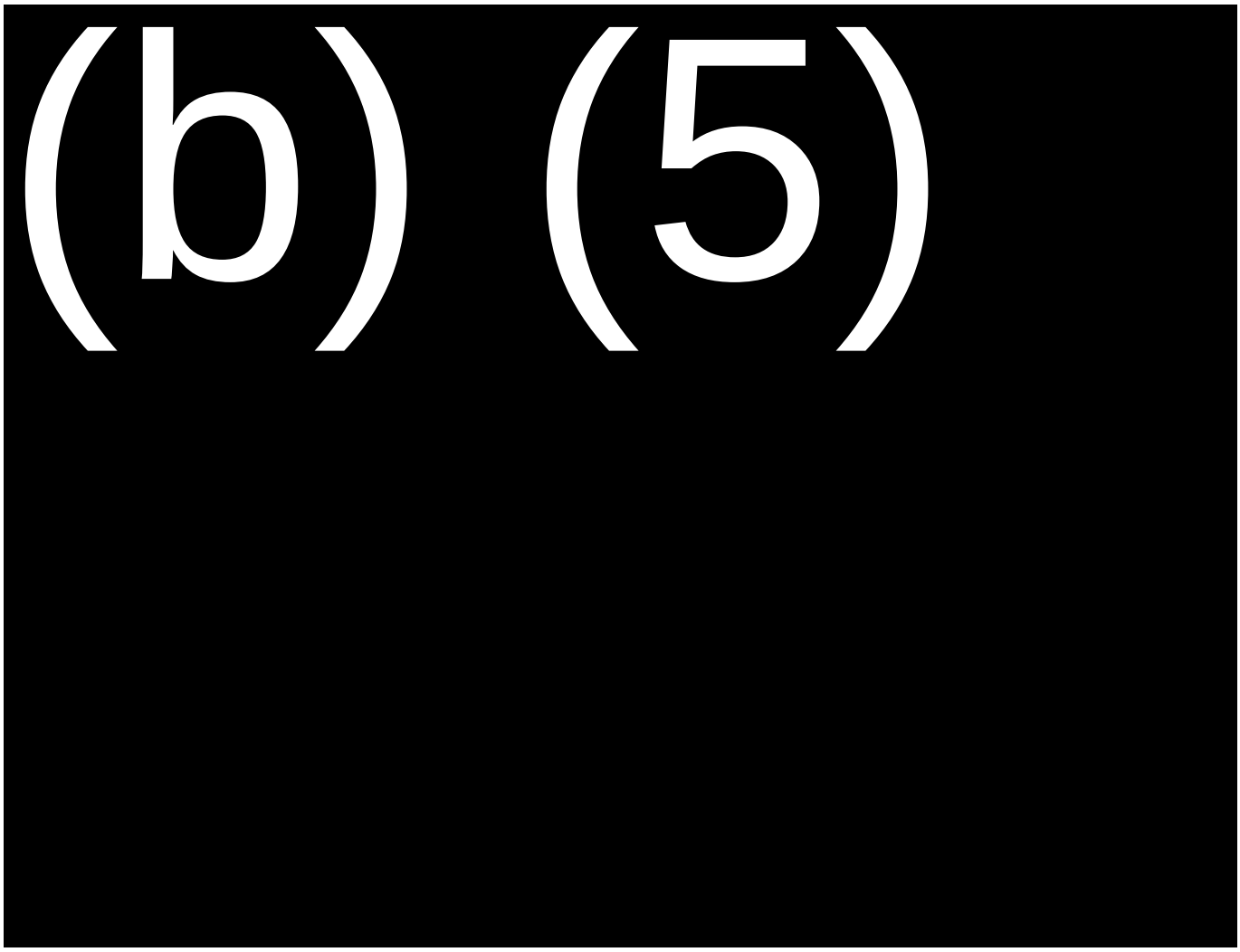
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Hall, Daniel
Sent: Thursday, May 03, 2012 12:21 PM
To: Jaffe, Judson; Metcalf, Gilbert
Subject: RE: Revenue Offsets from Carbon Charge



-----Original Message-----
From: Jaffe, Judson
Sent: Thursday, May 03, 2012 11:02 AM
To: Metcalf, Gilbert
Cc: Hall, Daniel
Subject: Revenue Offsets from Carbon Charge

(b) (5)

(b) (5)

(b) (5)

[redacted]

[redacted]

[redacted]

From:	Cameron Smith
To:	Metcalf, GilbertDisabled
Subject:	Re: NJ: Return of the Carbon Tax?
Date:	Friday, May 04, 2012 2:15:43 PM

So the yellow that you highlighted refers to AEI's submission to the Peterson Foundation last summer: http://www.aei.org/files/2011/05/25/Scholar-Peterson-Plan.pdf

They received very little attention or push back on the fact that the tax was included, which I view as a good thing.

When we get our ducks better aligned we'll certainly touch base.

Thanks for sending this!

On May 4, 2012, at 2:11 PM, <Gilbert.Metcalf@treasury.gov> wrote:

> Here it is. Would love to talk to you about your thinking when you are ready.
> g
>
> Gilbert E. Metcalf
> Deputy Assistant Secretary for Environment and Energy
> U.S. Department of the Treasury
> (202) 622-0173 (office)
(b)(6)
> (202) 622-0037 (fax)
> Email: gilbert.metcalf@treasury.gov
>
>
> http://nationaljournal.com/member/magazine/carbon-and-the-tax-reform-conversation-20120503?print=true
> Carbon Conversations: Return of the Carbon Tax?
>
> Some policymakers believe that corporate tax reform will provide an opportunity to reach a long-elusive deal on carbon emissions. Just don't call it a tax.
>
> by Coral Davenport
>
> Updated:
> May 3, 2012 | 2:00 p.m.
>
> What do Exxon Mobil, the nation's biggest oil company and a powerhouse of GOP influence, and Rep. Henry Waxman, the liberal California Democrat and a well-known foe of big oil, have in common? They both—along with a long list of influential economic thinkers from across the political spectrum—support the idea of putting a price on the carbon pollution that causes global warming.
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> Climate-change policy, of course, has become an explosively divisive issue in Washington and on the campaign trail, and conventional wisdom has held that any efforts to reform climate or energy policy in the near future are DOA in Congress. But a new idea is percolating among energy, environmental, and economic experts: An overhaul of the U.S. tax code could also serve as a vehicle to enact a carbon tax and potentially transform the nation's energy economy. The opportunity could arise if Congress, as expected, takes up tax reform next year.
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> The overall objective will be to boost U.S. global competitiveness and to simplify the code by lowering the 35 percent corporate tax rate and eliminating a host of breaks and loopholes. Lawmakers will also be grappling with the nation's staggering budget deficit and how to close it. That's where a potential deal on carbon comes in.
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> A tax on carbon—which is produced by almost every aspect of the U.S. energy economy, from coal-fired power plants to gasoline-burning automobiles—would raise the cost of coal and oil, drive consumers to new forms of energy, and potentially increase the nation's tax revenues. Republicans and fossil-fuel interest groups have slammed the idea for years as an unacceptable drag on the economy. But the bet is that in a broader fight about billions of dollars, corporate America might be willing to accept a new tax on carbon pollution in exchange for lower rates somewhere else.
>
> Among academics and economists, the carbon tax has long had robust support. The idea of a driving up the cost of a commodity that you want to marginalize—think liquor, cigarettes, and, yes, gasoline—is a classic social lever. But among the political class, the logic grows pretzeled. Lawmakers and corporations still feel burned after a high-profile climate-change bill collapsed in the Senate in the summer of 2010 and that fall took with it the seats of many House Democrats who voted for the measure. This failure was a repeat of Congress's first big attempt to fight climate change in 1993, when dozens of Democrats put their political lives on the line to vote for Vice President Al Gore's "Btu tax," essentially a carbon tax by another name. That vote eased the Republicans' sweep of the House in 1994 and contributed to the rise of conservative antitax lobbyist Grover Norquist. The president of Americans for Tax Reform has since committed 238 of the 242 current House Republicans and 41 of the 47 GOP senators to sign a pledge that they won't support any new taxes.
>
> Despite that history, the carbon tax has some powerful corporate allies, chief among them Exxon Mobil. Two years ago, the energy giant let the White House know that although it didn't support the complicated cap-and-trade bill that ultimately passed the House, it did support a straight carbon tax. Exxon Mobil, a lobbying force and a major donor to Republican political campaigns, stands by that position today.
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> There's a reason, of course, beyond good global citizenship: Exxon Mobil stands to profit handsomely from a carbon tax. The oil company is also the nation's largest developer of natural gas, a cheap source of electric power that produces only about half the carbon pollution of coal. A carbon tax would drive electric utilities to invest in new natural-gas plants, to the benefit of Exxon Mobil's bottom line. And the multinational corporation would still have its overseas markets in which to sell oil.
>
> The carbon tax has lots of other conservative friends, starting with Mitt Romney's economic adviser, Gregory Mankiw. An influential Harvard economics professor, Mankiw wrote a 2007 op-ed in The New York Times calling for a carbon tax as a solution to climate change. Conservative economist Arthur Laffer, a member of Ronald Reagan's Economic Policy Advisory Board who is sometimes known as the father of Reaganomics, is also a supporter. Even the right-leaning American Enterprise Institute has put forth a budget proposal that includes a carbon tax. Economist Douglas Holtz-Eakin, who advised Republican Sen. John McCain's presidential campaign and is now president of the conservative think tank American Action Forum, has endorsed various forms of carbon-pricing policy.
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> "There's a silent consensus on this in the country among thinking economists," Robert McNally, who served as a senior energy adviser to President George W. Bush and an energy adviser to Mitt Romney's 2008 presidential campaign, told National Journal, "but it's considered political suicide."
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> Well, there is that. Standing in the way of such a revolutionary step forward are people such as Norquist, who was quick to acknowledge to National Journal the growing discussion about reviving the carbon tax among conservative thinkers. "None of those guys have a vote in Congress, so that means diddly-squat," he said. "Proposing a further energy tax would get you squished in the next election.... This is an idea perfect for intellectuals, but it will be rejected by anyone who has to get elected.
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> Still, carbon-tax advocates are nonetheless quietly marshaling forces for a new debate, even as they concede that such an initiative would be a heavy lift. Indeed, few want to talk about it publicly for fear of jeopardizing the proposal before it's even born. "It's a no-brainer for a lot of Republican intellectuals," said one supporter, who asked for anonymity. "But, politically, it's really touchy stuff."
>
>

INTERAGENCY

REFERRAL

From:	Metcalf, Gilbert
To:	"Cameron Smith"
Subject:	RE: NJ: Return of the Carbon Tax?
Date:	Friday, May 04, 2012 2:17:00 PM

Whoops! I saw Doug's name below AEI and mentally transformed it to AAF. Sorry to cause you any distress.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Cameron Smith [(b)(6) @americanactionforum.org]
Sent: Friday, May 04, 2012 2:16 PM
To: Metcalf, Gilbert
Subject: Re: NJ: Return of the Carbon Tax?

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> g
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> Gilbert E. Metcalf
> Deputy Assistant Secretary for Environment and Energy
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>
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>
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> by Coral Davenport
>
> Updated:
> May 3, 2012 | 2:00 p.m.

>
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>
>

From:	Metcalf, Gilbert
To:	Jaffe, Judson; Hall, Daniel
Subject:	FW: revenue offsets in carbon tax estimates
Date:	Wednesday, May 09, 2012 1:13:00 PM

Not sure if I forwarded this to you or not. The haircut just got larger...

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Frank Sammartino [mailto:Frank.Sammartino@cbo.gov]
Sent: Monday, May 07, 2012 12:27 PM
To: Metcalf, Gilbert
Cc: Terry Dinan
Subject: RE: revenue offsets in carbon tax estimates

Gib,

The only revisions we've made to the revenue offset is to use JCT's published year-by-year estimates (https://www.jct.gov/publications.html?func=showdown&id=4406), rather than a simple 25 percent offset in each year. Please call or email if you have questions.

Best regards,
Frank

Frank Sammartino
Assistant Director, Tax Analysis
Congressional Budget Office
Washington DC 20515

Tel: (b) (6)
frank.sammartino@cbo.gov

From: Gilbert.Metcalf@treasury.gov [mailto:Gilbert.Metcalf@treasury.gov]
Sent: Friday, May 04, 2012 4:21 PM
To: Frank Sammartino
Cc: Terry Dinan
Subject: revenue offsets in carbon tax estimates

Frank,
I was speaking to Terry about the CBO Reducing the Deficit Options book's estimates of revenue from a carbon tax. Specifically I had asked if it assumed a 25 percent revenue offset from reduced collections from other taxes if a carbon tax was put in place. She said it did but then noted that your shop has been revamping that assumption to allow different offset reductions for different taxes. Could you tell me CBO's current assumption about the revenue offset from a carbon tax based on your new approach?
Feel free to give me a call if that's more convenient.
Best,
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov<mailto:gilbert.metcalf@treasury.gov>

From:	Heil, Mark
To:	Jaffe, Judson
Subject:	RE: Pending energy/envir work
Date:	Monday, June 25, 2012 5:42:43 PM

Thanks Jud.

It's a good thing we have other items on our plates..

From: Jaffe, Judson
Sent: Monday, June 25, 2012 4:47 PM
To: Heil, Mark
Subject: RE: Pending energy/envir work

Not that I am aware of. (b) (5) [redacted]

Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

From: Heil, Mark
Sent: Monday, June 25, 2012 4:28 PM
To: Jaffe, Judson
Subject: Pending energy/envir work

Hi Jud, how's it going?

Are you aware of any upcoming energy / environment policy or initiatives that EP might be involved in during the next year or so? I ask because we've been asked to brief our new DAS on energy issues tomorrow am, and it'd be good to know your sense of what, if anything, may be coming down the pike.

Thanks.

Mark Heil
Office of Economic Policy
U.S. Department of the Treasury
1500 Pennsylvania Avenue NW

Washington, DC 20220
Tel: 202.622.1442
Fax: 202.622.4112

From: Jaffe, Judson
To: Metcalf, Gilbert
Subject: RE: Save-the-Date: Carbon Tax Workshop at the Brookings Institution
Date: Tuesday, July 03, 2012 9:01:00 PM

Thanks.

-----Original Message-----
From: Metcalf, Gilbert
Sent: Tuesday, July 03, 2012 11:45 AM
To: Jaffe, Judson; Hall, Daniel
Subject: FW: Save-the-Date: Carbon Tax Workshop at the Brookings Institution

fyi

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Danny Cohen [(b) (6) @brookings.edu]
Sent: Tuesday, July 03, 2012 11:18 AM
Subject: Save-the-Date: Carbon Tax Workshop at the Brookings Institution

Dear Colleague:

You are cordially invited to attend the Brookings Institution's "Carbon Tax Workshop" on Friday, July 27th, from 9:30 a.m. to noon. The event will be located in the Stein Room of the Brookings Institution, 1775 Massachusetts Avenue NW.

The discussion will include these presentations:

Aparna Mathur will present her new results on the distributional effects of a carbon tax and carbon tax swaps. Her paper uses data from the Input-Output tables to calculate the effect of a $15 carbon tax on industry and consumer goods prices. These price increases are then passed through to consumers using consumption expenditure data from the Consumer Expenditure Survey. This methodology is applied to study incidence under a carbon tax-corporate tax swap where a part of the carbon tax revenues are used to offset a reduction in the corporate tax. Results suggest that such a swap could offset some of the regressivity associated with a carbon tax.

Dick Morgenstern, Jared Carbone, and/or Rob Williams will present work with their new general equilibrium model.

Pete Wilcoxen will present a recent study with Adele Morris and Warwick McKibbin: "The Potential Role of a Carbon Tax in U.S. Fiscal Reform." The paper examines fiscal reform options in the United States with an intertemporal computable general equilibrium model of the world economy called G-Cubed. Six policy scenarios explore two overarching issues: (1) the effects of a carbon tax under alternative assumptions about the use of the resulting revenue, and (2) the effects of alternative measures that could be used to reduce the budget deficit.

A detailed agenda will follow. Please RSVP to Danny Cohen at (b)(6) @brookings.edu<(b)(6) @brookings.edu> or call (b)(6) Mr. Cohen is out-of-office July 5th and 6th but will receive rsvps after those dates.

We hope to see you there.

Sincerely,

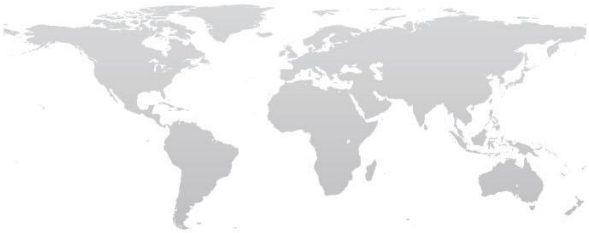
Adele Morris
Fellow and Policy Director, Climate and Energy Economics Project The Brookings Institution

ISSUE BRIEF

The Variability of Potential Revenue from a Tax on Carbon

Karen Palmer, Anthony Paul, and Matt Woerman

RESOURCES FOR THE FUTURE



May 2012
Issue Brief 12-03

Resources for the Future

Resources for the Future is an independent, nonpartisan think tank that, through its social science research, enables policymakers and stakeholders to make better, more informed decisions about energy, environmental, natural resource, and public health issues. Located in Washington, DC, its research scope comprises programs in nations around the world.

The Variability of Potential Revenue from a Tax on Carbon

Karen Palmer, Anthony Paul, and Matt Woerman[1]

Introduction

Washington is preparing for the upcoming presidential and congressional elections of 2012, and many policy watchers are busy trying to predict what the major items will be on the post-2012 policy agenda in Washington. The outcome of the election will shape this agenda to a large extent, but several of the issues that the government will need to tackle are already self-evident. Among these are the large and growing federal budget deficits, which are historic in size and growing rapidly. Reducing these deficits will require a bundle of spending cuts and new revenue sources, and some see the need to tackle this challenge as an opportunity for major tax reform in the United States. It may also present an opportunity for dealing with one of the most pressing environmental issues of our time, which is reducing the emissions of carbon dioxide (CO_2) that contribute to global climate change. Indeed, imposing a tax on CO_2 emissions could provide a means to discourage emissions of CO_2 and a source of revenue that could be used to address looming deficits and potentially play a role in tax reform focused on cutting taxes on individual and corporate incomes.

The role that a carbon tax could play in these efforts will depend on how much revenue such a tax is likely to produce. Some have estimated that a carbon tax of $10 per ton of CO_2 could generate annual tax revenues of $60 billion (Aldy et al. 2008), and experts suggest that a carbon tax of about $25 would raise roughly $125 billion per year.[2] The amount of carbon tax revenue will

[1] The authors are Senior Fellow, Center Fellow in the Center for Climate and Electricity Policy and Senior Research Assistant, respectively at Resources for the Future. The authors wish to thank Dallas Burtraw for inspiration and helpful comments, Adam Stern for research assistance and the Smith Richardson Foundation for financial support.

[2] "Considering a U.S. Carbon Tax: Frequently Asked Questions," webpage forthcoming in May 2012. Resources for the Future, www.rff.org.

depend on the level of the tax and how it is designed, including which sectors are covered and whether some of the tax revenues will be designated for special purposes, such as mitigating energy price increases for low-income households or limiting the impact on emissions leakage due to a domestic tax on energy-intensive and trade-exposed industries. Such provisions were included in the Waxman–Markey cap-and-trade bill (HR 2454), and large constituencies would advocate for such provisions in a carbon tax bill as well.

Carbon tax revenues will also depend on conditions in energy markets. Past analysis of economy-wide cap-and-trade programs (U.S. Energy Information Administration [EIA] 2009a) suggests that, for a Waxman–Markey type of policy, with CO_2 prices rising from $18 per ton in 2012 to $65 per ton in 2030, roughly 70 percent of the emissions reductions will come from the electricity sector, even though this sector currently accounts for only about 40 percent of domestic CO_2 emissions. This disproportionate reduction in emissions from electricity compared to other sectors is a result of its heavy use of coal as a fuel and the accompanying large potential for fuel switching. This, in turn, means that electricity ultimately will be responsible for less than 40 percent of the revenues from a carbon tax. The amount of carbon tax revenue from electricity will depend on the role of coal in electricity generation going forward, which in turn will depend on the price of natural gas. It will also depend on the future growth of electricity demand.

In this issue brief, we look at the sensitivity of carbon tax revenues from the electricity sector to carbon tax rates and secular trends in the forecasted levels of natural gas prices and electricity demand (Burtraw et al. 2012). We show that (a) carbon tax revenues from the electricity sector and for the economy will vary substantially with tax rates, (b) realizations of natural gas prices and electricity demand will have an important effect on potential revenues, and (c) the effect of these factors gets bigger the higher the carbon tax rate. Under a carbon tax of $25 per ton in 2020, revenues from the electricity sector can vary by roughly 18 percent and total carbon tax revenues can vary by up to 7 percent. After a point, increases in the tax rate lead to falling tax revenues as the tax base starts to erode with diminishing reliance on fossil fuels and greater use of renewables and nuclear. Lastly, we show that the effects of recent secular trends (that is, trends not driven by policy decisions) toward lower natural gas prices and reduced electricity demand growth almost perfectly offset a carbon tax of $10 per ton in 2020 on the national average retail electricity price.

Model and Scenarios

This analysis uses RFF's Haiku electricity market model (Paul et al. 2009) to look at the effects of different carbon tax trajectories on electricity markets under different assumptions about natural gas prices and growth in electricity demand. The Haiku model contains dynamic price-responsive modules for electricity demand and fuel supply that are calibrated to EIA's forecasts in their reference case projections but can vary from these forecasts according to information and

2012-08-054_000000000001600

policies represented in the model. Although this analysis is primarily focused on the effects of different policy scenarios on carbon tax revenues from the electricity sector, it also explores other aspects of electricity markets, including electricity prices, electricity generation levels, and the mix of fuels and technologies used to generate electricity in the future. This analysis identifies these effects by comparing the results of simulations with a carbon tax to the relevant baseline scenario without a carbon tax. The assumptions underlying the baseline and policy scenarios are described next.

BASELINE SCENARIOS

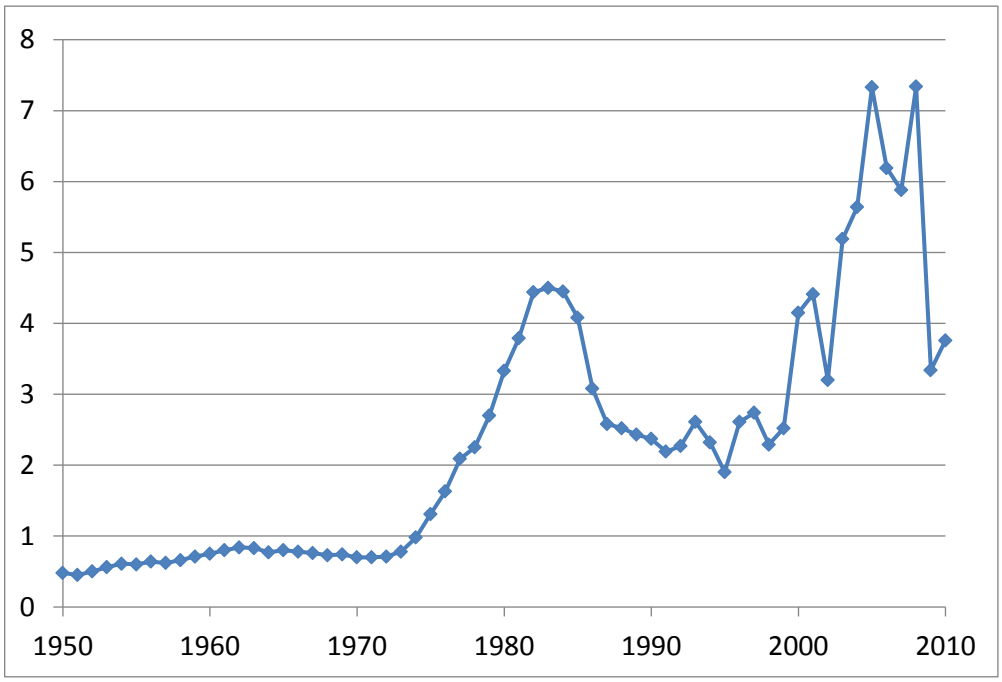
This analysis includes two baseline (BL) scenarios: one based on natural gas price and electricity demand growth trajectories that are consistent with EIA's Annual Energy Outlook (AEO) from 2011 (EIA 2011a; labeled AEO11 BL in the figures) and another based on EIA forecasts of gas prices and demand in the AEO from 2009 (EIA 2009b; labeled AEO09 BL in the figures). Over this time horizon, the perspective of energy analysis regarding both future electricity demand growth and fuel prices, has evolved dramatically, particularly for natural gas.

The evolution in EIA's electricity consumption and price forecasts is driven by assumptions about investments in energy efficiency, which are driven in part by state and national standards, as well as the slow recovery from the economic downturn of 2008. The efficiency investments have a lasting effect in that they are expected to result in more energy-efficient capital, reducing energy use over the long run. The downturn in the U.S. economy has an important effect in the short run, but that effect decays over time as the economy is assumed to return to normal levels of employment and economic activity. The sum of these two effects is that the 2011 forecast has lower levels of electricity consumption in all future years than the 2009 forecast, and this difference generally increases over time. For example, EIA's 2009 forecast projects an additional 65 terawatt-hours (TWh) of electricity consumption in 2012 compared to the 2011 forecast. By 2025, however, the difference between the projections increases to 142 TWh. These differences in the two AEO projections are reflected in the two different Haiku baseline scenarios through the different growth rates applied to electricity demand functions.

EIA forecasts of natural gas prices have also evolved considerably in recent years. EIA's AEO 2009 forecast projected total natural gas consumption in 2020 of 21.53 trillion cubic feet at an average wellhead price of $6.84 per million British thermal units, whereas the 2011 forecast projects total natural gas consumption in 2020 of 25.34 trillion cubic feet at an average wellhead price of $4.47 per million British thermal units. Between these two projections, consumption has increased by 18 percent while the price has fallen by 35 percent. In the Haiku model, the supply curve for

natural gas is varied by calibrating to alternative EIA forecasts for 2011 and 2009.[3] These recent changes to EIA's projections of natural gas prices reflect the volatile nature of natural gas prices in recent history. Figure 1 shows natural gas prices dating back to 1950 (EIA 2011b). Following a long period of stability, natural gas prices began to rise in the early 1970s and then fall throughout the 1980s, although in a relatively smooth manner. After the deregulation of natural gas prices throughout the early 1990s, however, prices became much more volatile with greater annual changes and sharp increases followed by sharp decreases or vice-versa. This change is best exemplified by the period 2002 to 2009, when the price quickly rose from $3.2 per thousand cubic feet (Mcf) in 2002 to $7.3/Mcf in 2005, and then sharply dropped from $7.3/Mcf in 2008 to $3.3/Mcf the next year.

Figure 1. Annual Average Natural Gas Wellhead Prices (2005$/Mcf)



In all other respects, the underlying assumptions in the two baseline scenarios are identical. These assumptions include estimates of future capital costs for new investments and the costs of other fuels. In all of the scenarios included in this analysis, the Clean Air Interstate Rule (CAIR) is assumed to remain in effect.[4] CAIR imposes regional constraints on sulfur dioxide and nitrogen

[3] For more information about this calibration and the calibration of electricity demand growth rates in Haiku, see Burtraw et al. (2012).

[4] CAIR was promulgated in 2005 but was subsequently vacated by the DC Circuit Court of Appeals and remanded to the U.S. Environmental Protection Agency. However, it remains in effect until a replacement is available; presumably, this will be CSAPR.

oxide emissions that are similar to, but somewhat less stringent than, those under the Cross-State Air Pollution Rule (CSAPR).[5]

POLICY SCENARIOS

This analysis considers three different carbon tax rates in combination with each of the baseline scenarios described above. The carbon tax is expressed as a tax on emissions of CO_2. Each scenario imposes a trajectory of CO_2 tax rates that grows at 5 percent annually in real terms. The tax rates assumed in 2020 under the three scenarios are $10, $25, and $40 per ton. (All dollar amounts are in 2009$.)[6]

Results

The results of this modeling analysis reveal that the level of a carbon tax and realizations of natural prices and electricity demand will have important effects on electricity prices, carbon tax revenue, electricity production, and emissions of CO_2. They also show how electricity markets in different regions of the country are affected under the various scenarios. Each of these factors is discussed in more detail below.

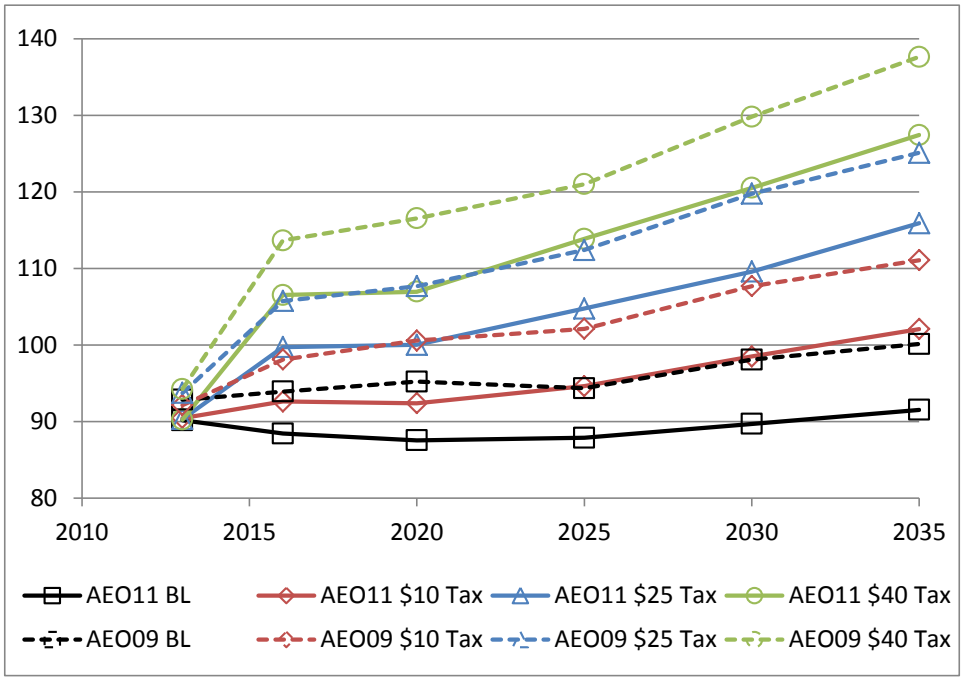
NATIONAL ELECTRICITY PRICES

Figure 2 shows the national average retail electricity price projections under different carbon tax scenarios and for both baselines. The solid lines represent those scenarios that use AEO 2011 assumptions for electricity demand growth and natural gas supply and the dashed lines represent the AEO 2009 scenarios. As projected prices increase with the level of the carbon tax, they also increase over time as the carbon taxes grow in real terms. The results also show that imposing the $10 tax trajectory on AEO 2011 assumptions yields prices approximately equal to AEO 2009 projections without a carbon tax. In other words, the electricity price reductions projected due to secular changes in natural gas supply and electricity demand between the AEO11 BL scenario and the AEO09 BL scenario (solid black versus dashed black lines in the graph) is almost exactly undone by imposing the $10 tax trajectory on the AEO 2011 assumptions (solid red line). In fact, at every tax level, the electricity price increments from the next lower tax level are almost exactly offset by recent secular trends.

[5] As of this writing, CSAPR has been stayed by the DC Circuit of the U.S. Court of Appeals pending judicial review.

[6] In all of these scenarios, we assume that revenues from the tax are returned in a lump-sum manner to households; in other words, they do not affect the fiscal position of the United States or the behavior of consumers in electricity markets.

Figure 2. National Average Retail Electricity Prices ($/MWh)



CARBON TAX REVENUES

The carbon tax revenues are clearly sensitive to underlying assumptions about natural gas supply and electricity demand growth, and they are uniformly lower when natural gas is less expensive and when demand growth is lower. Variability of carbon fee revenues with respect to these factors depends on the level of the fee. Figure 3 illustrates that for a $10 tax trajectory, tax revenues vary depending on assumptions about secular trends by a few billion dollars per year. With the higher $40 tax trajectory, tax revenues vary by as much as $25 billion per year, which is equal to roughly 30 percent of total annual tax revenue in the electricity sector. Another way to think about the variability is on a cumulative basis. Table 1 shows that the net present values of total carbon tax revenues over the 20-year time horizon from 2016 through 2035 vary by just over 14 percent for the $10 tax trajectory and by close to 27 percent for the $40 trajectory.

Figure 3. Annual Carbon Tax Revenues from the Electricity Sector (billions of 2009$)

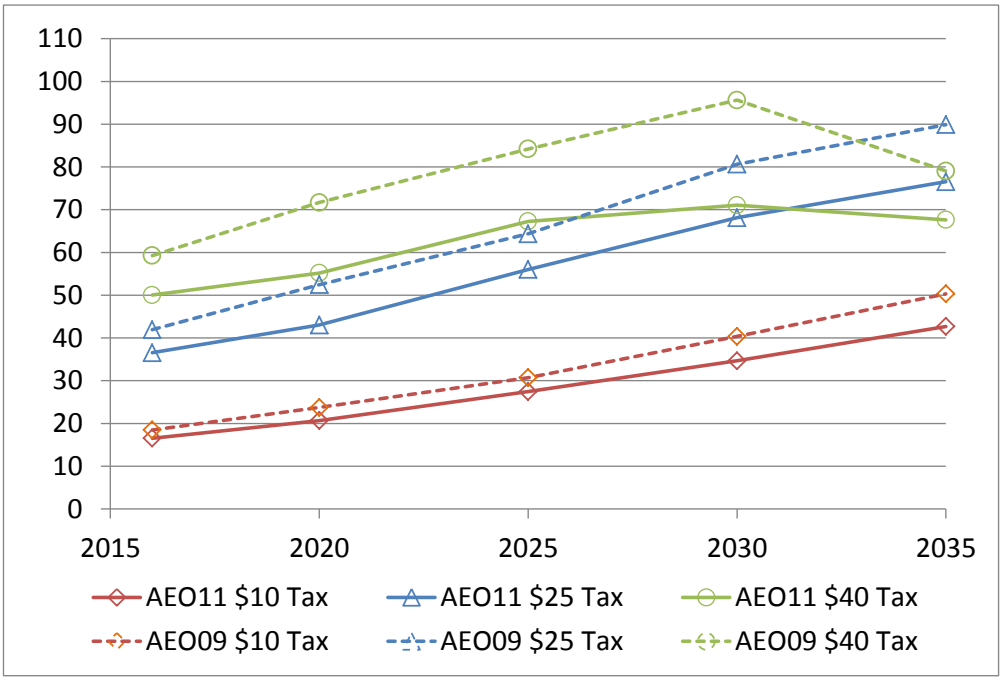


Table 1. Net Present Value of Carbon Tax Revenues from the Electricity Sector

	Net Present Value in 2016		
Baseline scenario	$10 Tax scenario	$25 Tax scenario	$40 Tax scenario
AEO 2011 (billions of 2009 $)	337.8	680.0	788.1
AEO 2009 (billions of 2009 $)	387.2	800.3	997.6
Percentage difference (%)	14.6	17.7	26.6

Annual carbon tax revenues also change over time as a result of changes in the tax rate and emissions profile. For the $10 and $25 tax trajectories, carbon tax revenues increase over time as the level of the tax rises. For the $40 tax trajectory, tax revenues increase until 2030 and then start to decline. Under the low demand and gas price projections of AEO 2011, revenues increase only slightly after 2025, and the decline after 2030 is gradual. With the higher gas price and demand growth in the AEO 2009, both the increase in tax revenues up until 2030 and the subsequent rate of decline are much higher. The decline in revenues is a direct result of the erosion of the CO_2 tax base as emissions fall faster than the tax rate grows, due to changes both in total generation and in the share of generation from fossil generators. The next section explores the effect of the policies on generation mix in more detail.

This analysis focuses only on the electricity sector, but a carbon tax would also generate revenues from other sectors of the economy. A previous analysis of an economy-wide cap-and-trade program (EIA 2009a), which yields a carbon price trajectory a little higher than the $25 tax trajectory analyzed here, suggests that nonelectricity sectors would provide additional tax revenues of $87.0 billion in 2016, which would increase to $234.2 billion in 2030. The analysis projects carbon tax revenues from the electricity sector of $51.7 billion in 2016, which would increase to $83.6 billion in 2026 and then fall to $72.1 billion in 2030. This suggests that the electricity sector would provide 24 to 37 percent of total carbon tax revenues. As shown in Figure 2, annual tax revenues from the electricity sector under the $25 tax trajectory can vary by approximately 15 to 20 percent. This indicates that the total revenue from a carbon tax could vary by roughly 4 to 7 percent as a result of changing forecasts of natural gas prices and electricity demand.

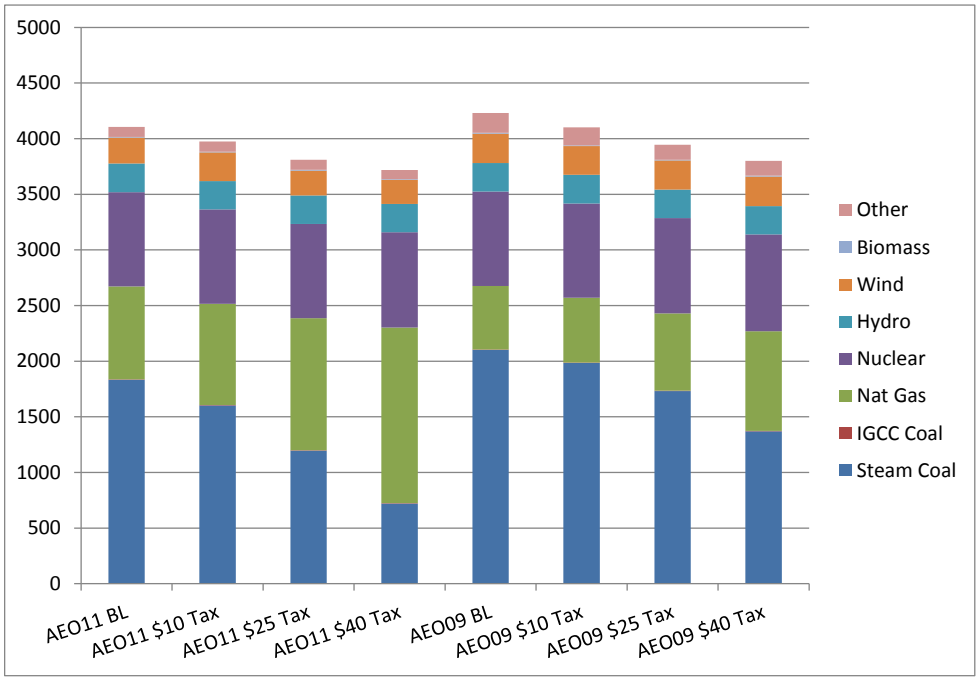
GENERATION TECHNOLOGIES

Both fuel prices and carbon taxes have important effects on how electricity is produced. Figures 4 and 5 show the mix of fuels and technologies used to generate electricity under each of the scenarios in 2020 and 2035, respectively. Under the AEO 2011 low gas price assumptions, natural gas plays a bigger role in electricity generation than under the 2009 cases. Under both assumptions about secular trends, that role grows over time and as the tax level increases. The relative shares of natural gas versus coal are a function of the relative prices of the two fuels, which in turn depend on their CO_2 emissions rates and the level of the carbon tax. In 2020, imposing a $25 tax on CO_2 with the AEO 2009 high gas price assumptions results in relative shares of coal and gas that are similar to those that occur in the AEO 2011 baseline scenario.

Under the $40 carbon tax trajectory, steam coal generation is driven to a small share by 2035, especially under the AEO 2011 lower gas price assumptions.[7] The overall share of fossil generation in 2035 under the $40 tax is 48 percent under AEO 2011 assumptions, but is only 42 percent under the 2009 assumptions. This diminution in the tax base is the reason for the rapid decline in CO_2 tax revenues in that scenario. As the carbon tax rate increases across scenarios and over time, so too does the role of nonemitting generation, including nuclear and wind. Also, the higher electricity demand growth assumptions in the 2009 case mean that the absolute level of nonemitting generation is higher, particularly by 2035.

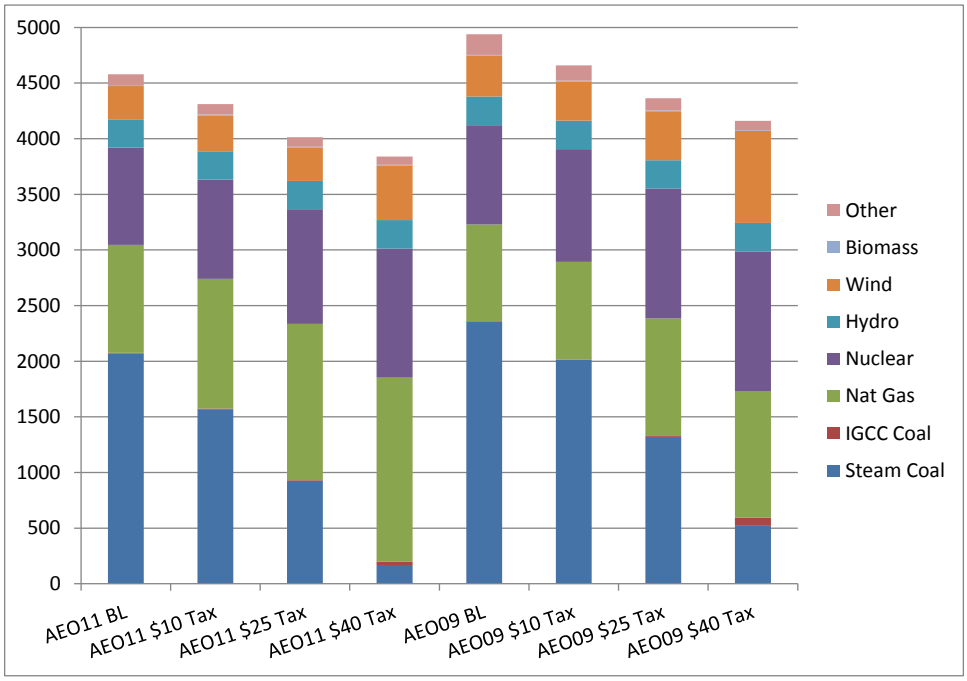
[7] Haiku does not simulate retrofit carbon capture and storage investments on existing coal boilers. By 2035, that technology might be commercially viable and would tend to increase the share of surviving coal boilers.

Figure 4. Electricity Generation in 2020 (TWh)



Note: IGCC, integrated gasification combined cycle.

Figure 5. Electricity Generation in 2035 (TWh)

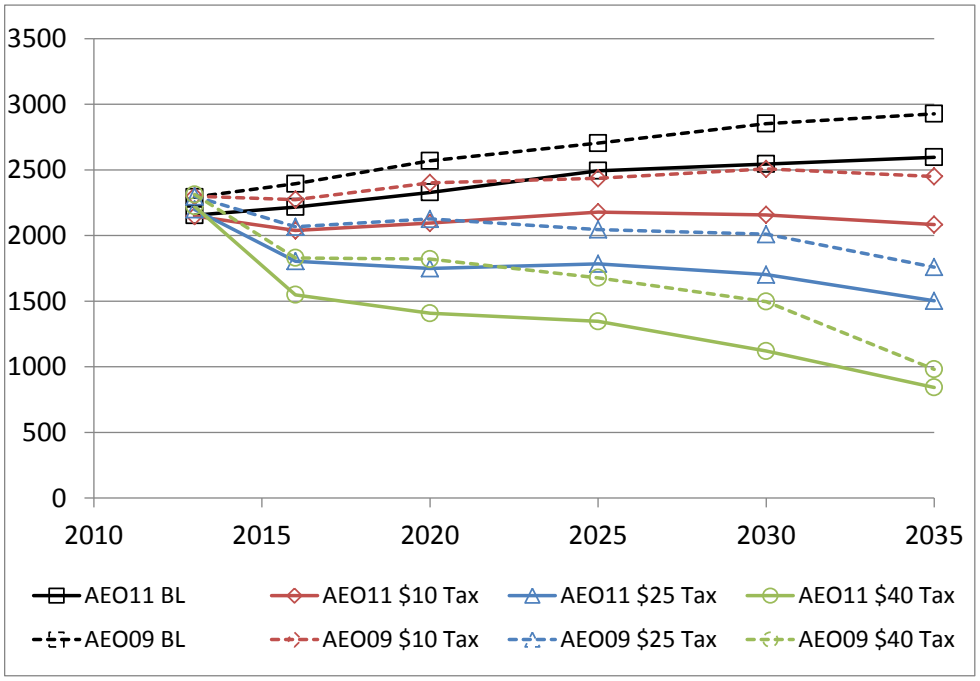


Note: IGCC, integrated gasification combined cycle.

CO_2 EMISSIONS

The effects of the different scenarios on emissions of CO_2 from the electricity sector are displayed in Figure 6. Changes in secular trends between AEO 2009 and AEO 2011 result in a lower projected trajectory of CO_2 emissions. Under the more recent assumptions, CO_2 emissions decline slightly over time under the $10 tax trajectory (red solid line) and by more than 25 percent with the $25 tax level (blue solid line). The difference in emissions between the AEO 2009 and 2011 baseline cases is equivalent to the effect of imposing the $10 tax trajectory on the AEO 2009 case. The combination of lower gas prices, more end-use energy efficiency, and the slower-than-expected recovery from the recession has had an important effect on lowering the future emissions of CO_2 relative to levels that were anticipated in early 2009.

Figure 6. National CO_2 Emissions from Electricity Generation (million tons)

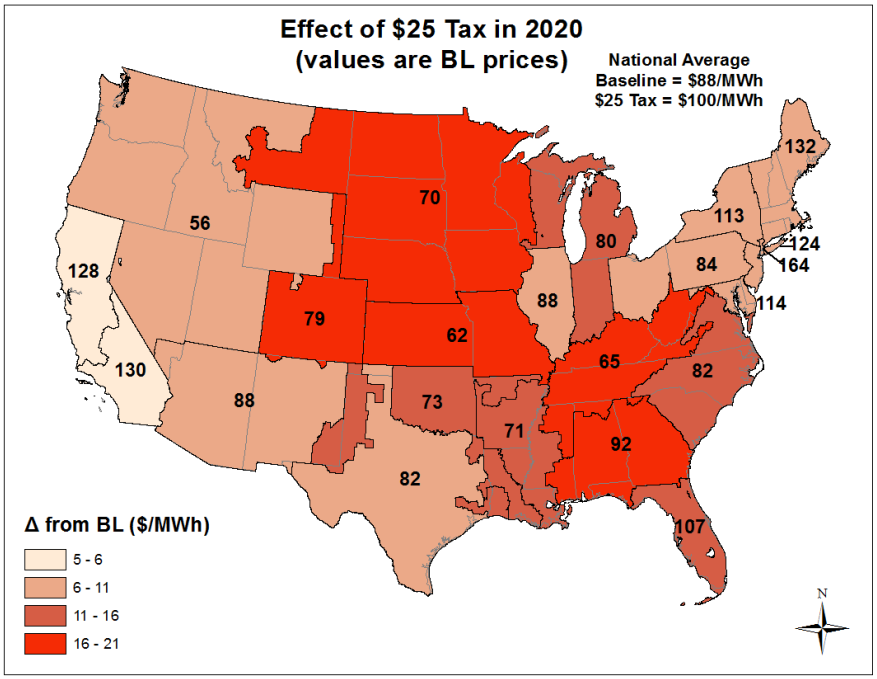


REGIONAL OUTCOMES

The national average retail electricity price trajectories shown in Figure 1 mask some important regional differences. Because the existing fleet of electricity generating capacity is heterogeneous across different regions of the country, and because consumers in different regions face different forms of electricity market regulation, the retail price effects of a CO_2 tax vary regionally. The price effects of the $25 tax in 2020, under the AEO 2011 assumptions, are shown in Figure 7. The number within each region is the regional retail electricity price ($/MWh) under the AEO11

baseline scenario, whereas the color of each region represents the price change due to the $25 carbon tax.

Figure 7. Regional Retail Electricity Prices



Note: MWh, megawatt-hour.

The largest price increases occur throughout the Plains, Appalachia, parts of the Midwest, and to a lesser extent the Southeast. These are the most coal-intensive regions of the country, some of which generate more than 70 percent of their electricity from coal in AEO11 BL. Because coal is more CO_2-intensive than other generation fuels, these regions face the largest tax burden, which is passed through to consumers in higher retail electricity prices. The regions of the country that rely less on coal to generate electricity, such as the Northeast, the West, and Texas, see smaller price effects. These regional differences in price changes have the interesting effect of generally leveling retail electricity prices across the country. The regions that experience the largest price increases, as shown by the boldest coloring in Figure 7, have prices below the national average in the baseline and continue to experience prices below the national average under the $25 carbon tax. Conversely, the regions with the highest baseline electricity prices, such as the Northeast and California, see only small to moderate price increases under the $25 tax. This results in smaller regional price disparities than exist without a tax on CO_2.

Conclusions

As the federal government looks for ways to address the fiscal challenges posed by large and growing federal deficits, discussions about a carbon tax have quietly emerged to identify a

potentially important source of new revenue. A carbon tax has much to recommend it, particularly because it provides an incentive to reduce emissions that are damaging to the environment and because it could be used to displace future taxes on investment income or labor, forms of economic activity that tend to be discouraged by increased taxes.

To understand the role that a carbon tax might play in fiscal reform, it is important to understand how much revenue such a tax might generate. A substantial fraction of the tax revenue from a carbon tax will come from the electricity sector. In this issue brief, we show that the amount of electricity-related revenue from a carbon tax will depend importantly on secular trends with respect to electricity demand growth and natural gas supply. The variability of the tax revenues with respect to those trends depends on the level of the tax. Under a $10 tax trajectory, annual electricity sector revenues vary by only a few billion dollars. If the $40 tax trajectory is adopted, revenues vary by up to 30 percent. Overall, the net present value of tax revenues from the electricity sector over the 20-year horizon beginning in 2016 varies from close to $350 billion to roughly $1 trillion, with even larger revenues expected from outside the sector with an economy-wide tax, as electricity is responsible for well under 50 percent of total carbon emissions in the United States.

The carbon tax has an important impact on the price of electricity paid by consumers. In this analysis, we show that the effects of recent secular trends toward lower natural gas prices and reduced electricity demand growth almost perfectly offset a carbon tax of about $10 per ton.

The political economy of a carbon tax proposal will depend importantly on what happens to electricity prices locally. Our analysis suggests that some of the regions that have low electricity prices currently will tend to be the hardest hit, in part because of their heavy reliance on coal. Nonetheless, for moderate carbon tax rates, these regions will continue to have low electricity prices, and the carbon tax tends to reduce existing price differences across the regions.

References

Aldy, Joseph E., Eduardo Ley, and Ian Parry. 2008. A Tax-Based Approach to Slowing Global Climate Change. *National Tax Journal* 56(3): 493–517.

Burtraw, Dallas, Karen Palmer, Anthony Paul, and Matt Woerman. 2012. Secular Trends, Environmental Regulation and Electricity Markets. Discussion paper 12-15. Washington, DC: Resources for the Future.

EIA (U.S. Energy Information Administration). 2009a. *Energy Market and Economic Impacts of H.R. 2454, the American Clean Energy and Security Act of 2009*. Washington, DC: EIA.

———. 2009b. *Annual Energy Outlook with Projections to 2030*. DOE/EIA-0383. Washington, DC: EIA.

———. 2011a. *Annual Energy Outlook 2011 with Projections to 2035*. DOE/EIA-0383. Washington, DC: EIA.

———. 2011b. *Annual Energy Review*. Washington, DC: EIA.

Paul, A., D. Burtraw, and K. Palmer. 2009. *Haiku Documentation: RFF's Electricity Market Model Version 2.0*. Washington DC: Resources for the Future.

From: Metcalf, Gilbert
To: "Danny Cohen"
Subject: RE: Save-the-Date: Carbon Tax Workshop at the Brookings Institution
Date: Monday, July 09, 2012 8:44:00 AM

I will plan to attend.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b) (6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Danny Cohen [mailto(b) (6) @brookings.edu]
Sent: Tuesday, July 03, 2012 11:18 AM
Subject: Save-the-Date: Carbon Tax Workshop at the Brookings Institution

Dear Colleague:

You are cordially invited to attend the Brookings Institution's "Carbon Tax Workshop" on Friday, July 27th, from 9:30 a.m. to noon. The event will be located in the Stein Room of the Brookings Institution, 1775 Massachusetts Avenue NW.

The discussion will include these presentations:

Aparna Mathur will present her new results on the distributional effects of a carbon tax and carbon tax swaps. Her paper uses data from the Input-Output tables to calculate the effect of a $15 carbon tax on industry and consumer goods prices. These price increases are then passed through to consumers using consumption expenditure data from the Consumer Expenditure Survey. This methodology is applied to study incidence under a carbon tax-corporate tax swap where a part of the carbon tax revenues are used to offset a reduction in the corporate tax. Results suggest that such a swap could offset some of the regressivity associated with a carbon tax.

Dick Morgenstern, Jared Carbone, and/or Rob Williams will present work with their new general equilibrium model.

Pete Wilcoxen will present a recent study with Adele Morris and Warwick McKibbin: "The Potential Role of a Carbon Tax in U.S. Fiscal Reform." The paper examines fiscal reform options in the United States with an intertemporal computable general equilibrium model of the world economy called G-Cubed. Six policy scenarios explore two overarching issues: (1) the effects of a carbon tax under alternative assumptions about the use of the resulting revenue, and (2) the effects of alternative measures that could be used to reduce the budget deficit.

A detailed agenda will follow. Please RSVP to Danny Cohen at (b) (6)@brookings.edu<mailto(b) (6) @brookings.edu> or call (b) (6) . Mr. Cohen is out-of-office July 5th and 6th but will receive rsvps after those dates.

We hope to see you there.

Sincerely,

Adele Morris
Fellow and Policy Director, Climate and Energy Economics Project
The Brookings Institution

From:	Jaffe, Judson
To:	Metcalf, Gilbert
Subject:	Re: economist leader
Date:	Tuesday, July 10, 2012 8:48:51 AM

Sure.

From: Metcalf, Gilbert
Sent: Tuesday, July 10, 2012 08:43 AM
To: Jaffe, Judson
Subject: economist leader

The most recent Economist had a leader on the benefits of a carbon tax. Could you track down an electronic copy. (b)(5) Thanks.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b) (6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From:	Metcalf, Gilbert
To:	Lago, Marisa
Subject:	RE: leader in most recent Economist
Date:	Tuesday, July 10, 2012 10:16:00 AM

(b)(5) [redacted]

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
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(b) (6) [redacted])
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Email: gilbert.metcalf@treasury.gov

From: Lago, Marisa
Sent: Tuesday, July 10, 2012 10:16 AM
To: Metcalf, Gilbert
Subject: RE: leader in most recent Economist

Thx. Really interesting article.

From: Metcalf, Gilbert
Sent: Tuesday, July 10, 2012 9:41 AM
To: Lago, Marisa; Brainard, Lael
Cc: Black, Laura; Fazili, Sameera
Subject: leader in most recent Economist

Thought you might find this leader from the most recent *Economist* on Australia's new carbon tax of interest.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b) (6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Metcalf, Gilbert
To: Climate Team
Subject: FW: NJ: Republican Thinkers Launch New Climate-Change Initiative
Date: Tuesday, July 10, 2012 10:48:01 AM

Interesting article

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http://mobile.nationaljournal.com/member/energy/republican-thinkers-launch-new-climate-change-initiative-20120710?mrefid=site_search&page=1

Republican Thinkers Launch New Climate-Change Initiative

By Coral Davenport | Tuesday, July 10, 2012 | 6:07 a.m. Photo: AP FILE PHOTO

A small cadre of big-name Republican thinkers, disturbed by their party's stance on climate change, are engaging in a nationwide campaign, launching on Tuesday, to persuade the GOP to embrace "conservative solutions" to global warming.

Over the past two years, tea party groups and fossil-fuel-funded super PACs have driven the GOP far to the right on global warming, as more Republicans question climate science or recant their former support of climate policy. That's led to a rift between moderates and hard-line conservatives -- emblematic of a larger divide in the party -- as some moderate Republicans fear that rejecting climate change could lead their party to be branded as antiscience.

The Energy and Enterprise Initiative, based at George Mason University, aims to unite moderate Republicans concerned about climate change with hard-line fiscal conservatives who want to cut taxes and government spending. It's led by former Rep. Bob Inglis, R-S.C., who has been on the outs with the right wing of his party since he lost his 2010 primary as a direct result of his support for climate-change policy.

On its own, Inglis's voice might not be enough to change the Republican conversation about climate change. But he has the support of Gregory Mankiw, economic advisor to the Mitt Romney campaign and the former chief economist of President George W. Bush's Council of Economic Advisers; Douglas Holtz-Eakin, president of the influential conservative think tank American Action Forum, former head of Bush's Council on Economic Advisers, and economic adviser to John McCain's 2008 presidential campaign; Art Laffer, the prominent conservative economist and former senior adviser to President Reagan; and George Shultz, Reagan's secretary of State, along with a slew of other conservative economic thinkers.

Mankiw, Romney's advisor, has long been a leading advocate of this policy -- although the Romney campaign declined to answer whether Romney himself would support it. Though Mankiw isn't expected to give speeches on behalf of the new campaign, given his involvement with Romney, Inglis described Mankiw as an "ally." And in an e-mail to National Journal, Mankiw wrote, "I am supportive of this effort."

Laffer, however, has already given one speech, at Vanderbilt University, supporting the policy. Last year, Holtz-Eakin held living-room meetings about climate change with New Hampshire voters.

The campaign will push one policy: a new tax on carbon pollution or gasoline consumption, paired with a cut in the income or payroll tax, creating a revenue-neutral, market-driven solution to an environmental problem while cutting taxes that conservatives dislike.

The idea is essentially to create a tax that will discourage fossil-fuel use and pollution while eliminating a tax in order to incentivize work and income. It's an old idea that environmentalist and former Vice President Al Gore also has supported, but one that conservative economists say could be reborn in a next year's effort to pass a sweeping tax-reform package.

The campaign will send conservative thinkers across the country to speak about the policy to conservative audiences, such as gatherings of college Republicans, members of the Federalist Society, or the annual Conservative Political Action Conference.

"Conservatives have the answer to energy and climate—it's free enterprise and fixing market distortions," Inglis told National Journal. "Entrepreneurs and investors will deliver the fuels of the future. It will be faster and more efficient than government. It's just a matter of conservatives stepping forward and engaging rather than retreating into denial about science, which is a strange place for us to be."

The initiative will be a tough sell in today's hotly partisan political climate, where any proposal of a new tax—let alone an energy tax—is explosive. But the moderates see an opening for the argument in a coming effort to overhaul the nation's tax code, a debate in which conservatives will push to cut income, payroll, and corporate taxes.

And in addition to the big-name GOP economists, the proposal may also find backing in other, surprising quarters: ExxonMobil, the nation's biggest oil company, has backed a carbon tax. The campaign also will work with insurance companies—long-standing allies of the Republican Party, but also a group which must take into account the projected impacts of climate change, such as property damage caused by rising sea levels and increased flooding.

Michael McKenna, a Republican energy lobbyist and strategist who works closely with House GOP leadership on energy policy, predicted that the push is likely to gain traction on the Hill.

"I think it has the potential to be important, mostly because people who would oppose them are kind of asleep at the switch," McKenna wrote in an e-mail. "It is also clearly an attempt to prepare for whatever sort of conversation we are going to have about tax reform in the next however many years."

Still, McKenna said Republicans are likely to encounter plenty of problems in the details of the proposal.

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From:	Metcalf, Gilbert
To:	Lago, Marisa; Brainard, Lael
Cc:	Fazili, Sameera; Black, Laura
Subject:	FW: NJ: Republican Thinkers Launch New Climate-Change Initiative
Date:	Tuesday, July 10, 2012 10:59:00 AM

I promise not to deluge you with articles but this one is especially interesting.

Gilbert E. Metcalf
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From: Keohane, Nathaniel (b)(6) @who.eop.gov]
Sent: Tuesday, July 10, 2012 10:34 AM
To: Metcalf, Gilbert
Subject: FW: NJ: Republican Thinkers Launch New Climate-Change Initiative

Interesting.

http://mobile.nationaljournal.com/member/energy/republican-thinkers-launch-new-climate-change-initiative-20120710?mrefid=site_search&page=1

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By Coral Davenport | Tuesday, July 10, 2012 | 6:07 a.m.

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From: Metcalf, Gilbert
To: Jaffe, Judson
Subject: RE: international tax comparisons
Date: Tuesday, July 10, 2012 1:59:00 PM
Attachments: (b) (5)

(b)(5)

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
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(b) (6)
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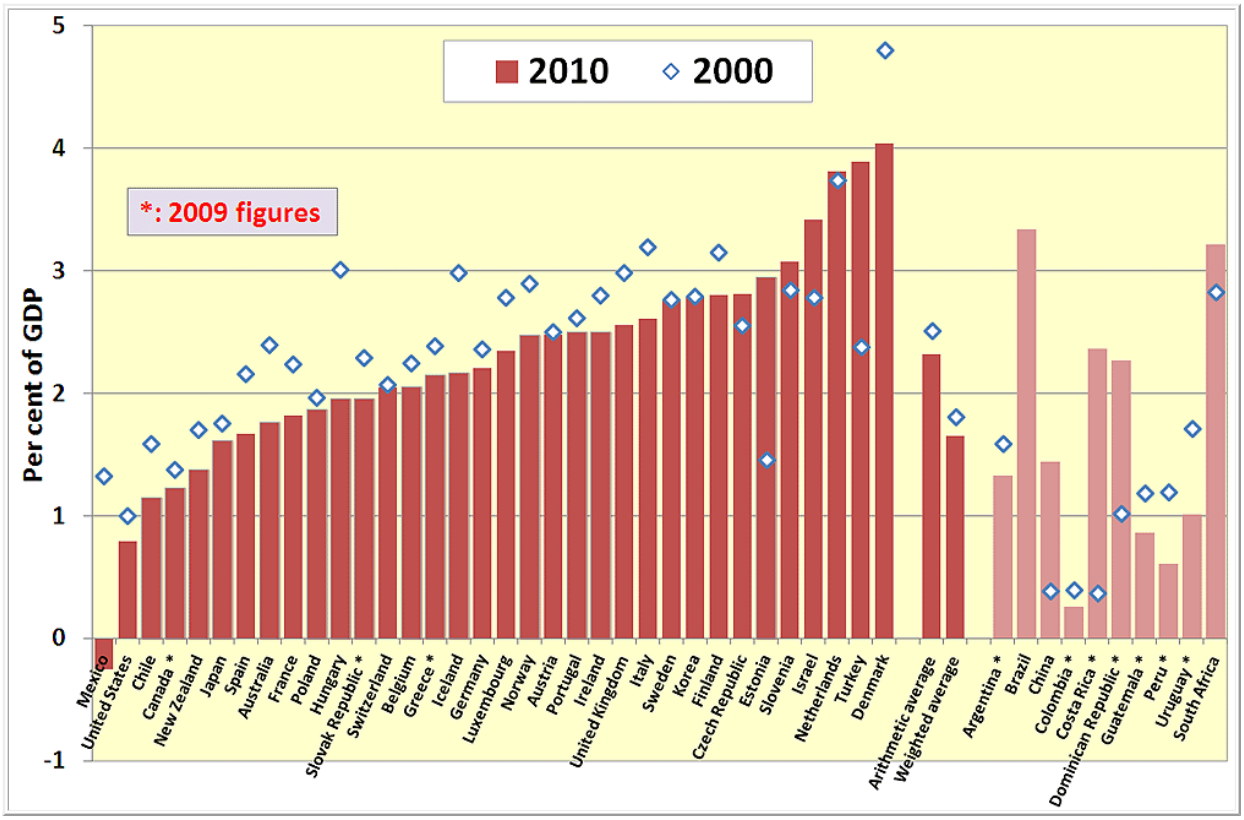
Email: gilbert.metcalf@treasury.gov

From: Jaffe, Judson
Sent: Tuesday, July 10, 2012 1:56 PM
To: Metcalf, Gilbert
Subject: RE: international tax comparisons

(b)(5)

Revenues from environmentally related taxes in per cent of GDP in selected countries



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From: Metcalf, Gilbert
Sent: Tuesday, July 10, 2012 1:51 PM
To: Jaffe, Judson
Subject: international tax comparisons

International comparisons at:

http://www2.oecd.org/ecoinst/queries/

scroll down to the link on enviro related taxes, fees and charges for some charts and data

Gilbert E. Metcalf
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Email: gilbert.metcalf@treasury.gov

From:	Metcalf, Gilbert
To:	Jaffe, Judson
Subject:	RE: NJ: Republican Thinkers Launch New Climate-Change Initiative
Date:	Thursday, July 12, 2012 1:48:00 PM

Not now.

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From: Jaffe, Judson
Sent: Thursday, July 12, 2012 1:40 PM
To: Metcalf, Gilbert
Subject: FW: NJ: Republican Thinkers Launch New Climate-Change Initiative

(b) (5)

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Email: judson.jaffe@treasury.gov

From: Metcalf, Gilbert
Sent: Tuesday, July 10, 2012 10:48 AM
To: Climate Team
Subject: FW: NJ: Republican Thinkers Launch New Climate-Change Initiative

Interesting article

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http://mobile.nationaljournal.com/member/energy/republican-thinkers-launch-new-climate-

change-initiative-20120710?mrefid=site_search&page=1

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From:	Metcalf, Gilbert
To:	Eberly, Janice; Brainard, Lael; Mazur, Mark; Lago, Marisa
Cc:	Fazili, Sameera; Black, Laura
Subject:	FW: another convert
Date:	Friday, July 13, 2012 9:09:00 AM

Thought you'd find this of interest.

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From: Metcalf, Gilbert
Sent: Friday, July 13, 2012 9:08 AM
To: Climate Team
Subject: another convert

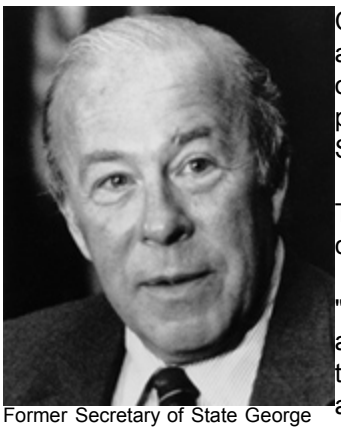
A Republican icon puts his weight behind a tax on CO2 emissions

Evan Lehmann, E&E reporter

Published: Friday, July 13, 2012

Former Secretary of State George Shultz is preparing to promote a carbon tax, putting him in the company of a small cluster of Republican statesmen who are embracing efforts to reduce greenhouse gases that their party has rejected.

Shultz, who spent nearly seven years in President Reagan's Cabinet, says a carbon tax that returns its revenue to taxpayers and public programs could eventually be accepted by the Republican Party, despite its current hostile outlook on measures that reduce emissions.


Former Secretary of State George

Conservative principles related to national security and economic stability -- and the impacts that foreign oil disruptions and price fluctuations can have on them -- naturally appeal to Republicans, Shultz said in an interview published yesterday by Stanford University's Precourt Institute for Energy. Shultz is chairman of the institute's advisory board.

Those interests would benefit from a carbon tax that decreases U.S. consumption of foreign oil, Shultz said.

"Another is that the globe is warming, which is not a matter of opinion, but a matter of fact. The Arctic is melting," he added. "If you could bring together the constituencies concerned with national security, the economy and the environment -- both local and global -- that would be a potent

Shultz. Photo courtesy of Library of Congress.

coalition."

The move by Shultz adds him to a mini-surge of Republicans who have recently made similar proposals about a carbon tax, prompting one conservative to wonder whether there's a "virus" infecting the elder statesmen of the Republican Party.

Earlier this week, former Rep. Bob Inglis (R-S.C.), who says that his 2010 election defeat was related to his belief in global warming, launched the Energy and Enterprise Initiative at George Mason University. One of its key objectives is promoting a carbon tax (*Greenwire*, July 10).

Similar policies have also been promoted by Greg Mankiw, the former chairman of President George W. Bush's Council of Economic Advisers and a current adviser to Mitt Romney, and Art Laffer, a former economic adviser to Reagan.

'Vanity and egotism'?

But Shultz's arrival attaches a bigger name to the carbon tax. His long tenure with Reagan, an icon among current-day Republicans, followed elevated stints in the Eisenhower and Nixon administrations.

"The more credible conservatives that are talking about this positive conservative solution, the better chance that we'll be able to start changing the conversation in the broader conservative movement," said Alex Bozmoski, director of strategy and operations at Inglis' Energy and Enterprise Initiative.

"A lot of conservatives remain skeptical about climate science, and it's important to convey the conservative message that there are solutions to energy security which minimize risks to our environment and climate," he added.

But others see the entrance by Shultz and others as a crafty, if misinformed, effort to reinflate their bygone political profiles.

"There seems to be an eruption of conservatives -- very moderate-seeming conservatives, non-tea party, old country club-style conservatives -- who are suddenly enamored of carbon tax," said Kenneth Green, a resident scholar at the American Enterprise Institute.

"I think this is mostly vanity and egotism on the part of these people who are coming forward, to try and reassert the Republican establishment over the tea party revolution," he added. "I wouldn't be surprised if we have more of these guys weigh in."

Carbon is 'the problem,' not taxes

Green says Shultz and others are basing their policies on outdated "narratives of carbon trajectories," which he says changed with increased use of natural gas and other efforts to slow emission rates.

That response is perhaps unsurprising. Shultz's actions put him at odds with his party's positions on energy and taxes. Many Republican lawmakers criticize scientific assertions about climate change and strongly reject efforts to mandate emission reductions.

Romney has made increased domestic oil production, affordable energy prices and less environmental regulation key elements of his presidential campaign.

He opposes directives to cut carbon emissions, because he says the U.S. economy would suffer as other nations continue to release emissions unabated.

"So the notion that the U.S. can act unilaterally on carbon emissions and make a material difference on global greenhouse gases is not realistic," Linda Gillespie Stuntz, a former Energy Department official

and a Romney surrogate, said during a debate this week. "It will only hamstring our economy."

For his part, Shultz said, "Getting control of carbon is right at the heart of the problem.

"We have to have a system where all forms of energy bear their full costs," he said. "For some, their costs are the costs of producing the energy, but many other forms of energy produce side effects, like pollution, that are a cost of society. The producers don't bear that cost; society does. There has to be a way to level the playing field and cause those forms of energy to bear their true costs."

To do that, he added, "means putting a price on carbon."

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INTERAGENCY

REFERRAL

INTERAGENCY

REFERRAL

From: Jaffe, Judson
To: (b) (6) @brookings.edu"
Subject: Carbon Tax Workshop at the Brookings Institution
Date: Monday, July 16, 2012 9:48:00 AM

Danny,

I attended the last workshop at RFF and would like to come to the upcoming one on the 27th if possible.

Thanks!
Jud

_____
Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

From: Danny Cohen
To: Jaffe, Judson
Subject: RE: Carbon Tax Workshop at the Brookings Institution
Date: Monday, July 16, 2012 10:00:07 AM

Dr. Jaffe

We look forward to seeing you at the event.

Sincerely,

Danny Cohen

From: Judson.Jaffe@treasury.gov [mailto:Judson.Jaffe@treasury.gov]
Sent: Monday, July 16, 2012 9:48 AM
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Email: judson.jaffe@treasury.gov<mailto:judson.jaffe@do.treas.gov>

From: Metcalf, Gilbert
To: DeValk, Randall
Subject: RE: The Hill - GOP leaders slam the door on carbon taxes
Date: Monday, July 16, 2012 2:44:00 PM

Yes, there's been quite a bit of activity in the press this past week. Another data point. (b) (5) [redacted]
Gib

All sides agree a carbon tax could be included in expected tax code overhaul
Jean Chemnick, E&E reporter
Published: Monday, July 16, 2012
The idea of a carbon tax has crept back onto the policy landscape in the past few weeks after years in the wilderness, and while specifics are still scarce, groups from across the political spectrum say it could take shape as part of a tax reform package expected in the next session of Congress.
Some conservatives, including economist Kevin Hassett of the American Enterprise Institute, have put forward the idea of a carbon tax swap, which would reduce taxes on labor or capital to offset the revenue raised via the tax. Such a trade could be made as part of a larger overhaul of the federal tax code, they suggest.
That is an idea that former Rep. Bob Inglis (R-S.C.) championed in the House, and last week he launched an initiative that has him taking the idea on the road to talk to Republicans and conservatives across the country (Greenwire, July 10).
President Reagan's Secretary of State George Shultz has also indicated he will back a carbon tax (ClimateWire, July 12).
"The necessity of new revenue as part of a tax reform package that lowers corporate and individual rates and cuts the debt is the underlying and broader driver in renewed conservative attention on these issues," said Paul Bledsoe, a former Senate Finance Committee aide who is now senior adviser at the Bipartisan Policy Center.
But others who are eyeing a carbon tax are less enthusiastic about conservatives' plans for the money that would be raised.
Autumn Hanna of Taxpayers for Common Sense said her group has supported a carbon tax for two decades but as a means of reducing the deficit.
"As far as revenue neutrality, that's not something that we think makes sense," she said.
The purpose of the new tax would be to raise revenue not to finance reductions elsewhere in the tax code, she said. "So if we do a direct tax swap by itself, that's not something that we think long term makes fiscal sense."
Taxpayers for Common Sense would entertain the idea of a larger tax overhaul effort that included a carbon tax and other changes, however.
Hanna said that reducing carbon dioxide would also help shield taxpayers from climate-related costs down the road, like weather-related damage to infrastructure. "We have to make sure we're looking at everything," she said.
Tyson Slocum, director of the energy program for Public Citizen, said his organization would not back a deal on carbon tax that was not "consumer-centric."
The carbon price will increase costs to consumers, he said, so Public Citizen will only accept offsets that go to benefit consumers, such as a dividend or payroll tax cut. The group will not accept a carbon tax as a way to lower corporate taxes, he said.
And Slocum said environmentalists and their political allies needn't offer that kind of deal. Fossil fuels companies and Republicans are already looking for ways to rid themselves of U.S. EPA carbon regulations, he said, and that will require legislation that can pass both chambers of Congress.
"There are not going to be the votes to revoke that authority," he said. "And the Supreme Court and lower court decisions have all made their rulings loud and clear that the EPA has this authority."
A federal appeals court ruled last month (Greenwire, June 26) that EPA was "unambiguously correct" in its current plans to regulate greenhouse gas regulations, making any future challenge to the agency's climate rules very difficult.
The only way for Republicans to win enactment of a bill that would pre-empt EPA is to return to the negotiating table with Democrats, Slocum said -- and Republicans know that.
"I think some of the prominent Republicans that are no longer actively holding office are saying these things, they're simply reflecting what's being said in private," he said. He added that current lawmakers

are too hamstrung by the right wing of their party to show a willingness to bargain but such a strategy might reveal itself after the election.
Last week, BP Alternative Energy CEO Katrina Landis said a revenue-neutral carbon tax would be fine if it treated all forms of energy equally.
"What I think we wouldn't want to see is different forms of energy receiving different penalties associated with their greenhouse gas impact if it isn't measured greenhouse gas impact," she said.
Slocum said Democrats should not weaken their position by offering corporate tax cuts as a sweetener before negotiations even begin.
Economist Robert Shapiro, chairman and co-founder of the private finance consultant firm Sonecon, said EPA regulations could indeed strengthen environmentalists' hand.
"If the president is re-elected, the prospect of direct regulation will become a powerful incentive to find other ways to address greenhouse gases," he said.
The eventual bargain might have to include EPA pre-emption coupled with a significant, escalating carbon tax, he said.
But Shapiro said the process could still be done in the context of a tax overhaul that gave Republicans some other things they have sought, including lower corporate tax rates, and that benefitted consumers.
"There would be horse trading," he predicted.

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-----Original Message-----
From: DeValk, Randall
Sent: Monday, July 16, 2012 2:40 PM
To: Metcalf, Gilbert
Subject: FW: The Hill - GOP leaders slam the door on carbon taxes

Gilbert -

Have seen several articles on this issue since we spoke. Am guessing you closely follow these items and may have already seen this particular story. Certainly not the last word on this issue, but is a noteworthy data point.

See you tomorrow.

The Hill - GOP leaders slam the door on carbon taxes
Ben Geman
July 16, 2012

Capitol Hill's most powerful Republicans say advocates who have been discussing a carbon tax behind closed doors are wasting their breath.

House Speaker John Boehner (R-Ohio) and Senate Minority Leader Mitch McConnell (R-Ky.), speaking through aides, have stated their opposition to the concept in recent days.

Boehner spokesman Michael Steel had a one-word answer when asked, on Friday, whether the speaker would ever consider a carbon tax to help address climate change and the deficit: “No.”

Similarly, McConnell spokesman John Ashbrook said Monday that “Leader McConnell opposes a national energy tax.”

While their positions are no surprise, the categorical opposition underscores the hurdles facing an ad-hoc, left-right coalition of activists and policy wonks who have held a series of meetings in private to discuss the idea.

The most recent meeting was last week at the headquarters of the conservative American Enterprise Institute, as reported by The Hill.

Backers of carbon taxes say the policy would help curb greenhouse gas emissions, and raise revenues to help battle the deficit or enable reductions of other tax rates.

A draft of the agenda prepared for last week's meeting included representatives and scholars with groups such as the Union of Concerned Scientists, AEI, Public Citizen, the free-market group R Street, the Center on Budget and Policy Priorities, ConservAmerica (which was formerly called Republicans for Environmental Protection), Taxpayers for Common Sense, and others.

http://thehill.com/blogs/e2-wire/e2-wire/238111-boehner-mcconnell-slam-door-on-carbon-taxes

From: Metcalf, Gilbert
To: "Jeremy Lerman"
Subject: RE: NJ: Republican Thinkers Launch New Climate-Change Initiative
Date: Tuesday, July 17, 2012 9:28:00 AM

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1 at Caribou is good.

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-----Original Message-----
From: Jeremy Lerman [(b) (6) @americanactionforum.org]
Sent: Tuesday, July 17, 2012 9:24 AM
To: Metcalf, Gilbert
Subject: RE: NJ: Republican Thinkers Launch New Climate-Change Initiative

The morning is pretty tight. Can you do 1 pm? There is a Caribou Coffee at 601 13th St, NW (13th and G.)

-----Original Message-----
From: Gilbert.Metcalf@treasury.gov [mailto:Gilbert.Metcalf@treasury.gov]
Sent: Monday, July 16, 2012 5:02 PM
To: Jeremy Lerman
Subject: RE: NJ: Republican Thinkers Launch New Climate-Change Initiative

Jeremy,
Thursday morning is good (before noon). Early to mid-afternoon that day works as well. Having Cameron and Catrina join is fine.
Gib

Gilbert E. Metcalf
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-----Original Message-----
From: Jeremy Lerman [(b) (6) @americanactionforum.org]
Sent: Wednesday, July 11, 2012 9:18 AM
To: Metcalf, Gilbert
Subject: RE: NJ: Republican Thinkers Launch New Climate-Change Initiative

Good Morning Gib,

Doug would love to have coffee. Cameron and Catrina, Director of Energy Policy, would also like to join if that's ok. Doug is out of town this week but returns next Tuesday - what times work best for you next Tues - Fri?

Jeremy

Jeremy Lerman
Assistant to Doug Holtz-Eakin

American Action Forum
555 13th Street, NW
Suite 510 W
Washington, DC 20004
Direct: (b)(6)
Cell: (b)(6)

From: Gilbert Metcalf <gilbert.metcalf@treasury.gov<mailto:gilbert.metcalf@treasury.gov>>
To: Douglas Holtz-Eakin
(b) (5) @americanactionforum.org<mailto(b) (5) @americanactionforum.org>>
Subject: FW: NJ: Republican Thinkers Launch New Climate-Change Initiative

Doug,
Very interesting article below. I've been keeping in touch with Cameron about your group's activities. It would be great to sit down with you so I could tap into your expertise from having been in government on moving policy. You have time for coffee or lunch in the next few weeks?
Best,
Gib

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http://mobile.nationaljournal.com/member/energy/republican-thinkers-launch-new-climate-change-initiative-20120710?mrefid=site_search&page=1
Republican Thinkers Launch New Climate-Change Initiative By Coral Davenport | Tuesday, July 10, 2012 | 6:07 a.m. [cid:image001.jpg@01CD5F46.0F08B230] Photo: AP FILE PHOTO A small cadre of big-name Republican thinkers, disturbed by their party's stance on climate change, are engaging in a nationwide campaign, launching on Tuesday, to persuade the GOP to embrace "conservative solutions" to global warming.
Over the past two years, tea party groups and fossil-fuel-funded super PACs have driven the GOP far to the right on global warming, as more Republicans question climate science or recant their former support of climate policy<http://www.nationaljournal.com/magazine/heads-in-the-sand-20111201>. That's led to a rift between moderates and hard-line conservatives -- emblematic of a larger divide in the party -- as some moderate Republicans fear that rejecting climate change could lead their party to be branded as antiscience.
The Energy and Enterprise Initiative, based at George Mason University, aims to unite moderate Republicans concerned about climate change with hard-line fiscal conservatives who want to cut taxes and government spending. It's led by former Rep. Bob Inglis, R-S.C., who has been on the outs with the right wing of his party since he lost his 2010 primary as a direct result of his support for climate-change policy.
On its own, Inglis's voice might not be enough to change the Republican conversation about climate change. But he has the support of Gregory Mankiw, economic advisor to the Mitt Romney campaign and the former chief economist of President George W. Bush's Council of Economic Advisers; Douglas Holtz-Eakin, president of the influential conservative think tank American Action Forum, former head of Bush's Council on Economic Advisers, and economic adviser to John McCain's 2008 presidential campaign; Art Laffer, the prominent conservative economist and former senior adviser to President Reagan; and George Shultz, Reagan's secretary of State, along with a slew of other conservative economic thinkers. Mankiw, Romney's advisor, has long been a leading advocate of this policy -- although the Romney

campaign declined to answer whether Romney himself would support it. Though Mankiw isn't expected to give speeches on behalf of the new campaign, given his involvement with Romney, Inglis described Mankiw as an "ally." And in an e-mail to National Journal, Mankiw wrote, "I am supportive of this effort."

Laffer, however, has already given one speech, at Vanderbilt University, supporting the policy. Last year, Holtz-Eakin held living-room meetings about climate change with New Hampshire voters.

The campaign will push one policy: a new tax on carbon pollution or gasoline consumption, paired with a cut in the income or payroll tax, creating a revenue-neutral, market-driven solution to an environmental problem while cutting taxes that conservatives dislike.

The idea is essentially to create a tax that will discourage fossil-fuel use and pollution while eliminating a tax in order to incentivize work and income. It's an old idea that environmentalist and former Vice President Al Gore also has supported, but one that conservative economists say could be reborn in a next year's effort to pass a sweeping tax-reform package.

The campaign will send conservative thinkers across the country to speak about the policy to conservative audiences, such as gatherings of college Republicans, members of the Federalist Society, or the annual Conservative Political Action Conference.

"Conservatives have the answer to energy and climate-it's free enterprise and fixing market distortions," Inglis told National Journal. "Entrepreneurs and investors will deliver the fuels of the future. It will be faster and more efficient than government. It's just a matter of conservatives stepping forward and engaging rather than retreating into denial about science, which is a strange place for us to be."

The initiative will be a tough sell in today's hotly partisan political climate, where any proposal of a new tax-let alone an energy tax-is explosive. But the moderates see an opening for the argument in a coming effort to overhaul the nation's tax code, a debate in which conservatives will push to cut income, payroll, and corporate taxes.

And in addition to the big-name GOP economists, the proposal may also find backing in other, surprising quarters: ExxonMobil, the nation's biggest oil company, has backed a carbon tax. The campaign also will work with insurance companies-long-standing allies of the Republican Party, but also a group which must take into account the projected impacts of climate change, such as property damage caused by rising sea levels and increased flooding.

Michael McKenna, a Republican energy lobbyist and strategist who works closely with House GOP leadership on energy policy, predicted that the push is likely to gain traction on the Hill.

"I think it has the potential to be important, mostly because people who would oppose them are kind of asleep at the switch," McKenna wrote in an e-mail. "It is also clearly an attempt to prepare for whatever sort of conversation we are going to have about tax reform in the next however many years."

Still, McKenna said Republicans are likely to encounter plenty of problems in the details of the proposal. "It suffers from a real lack of specifics," he wrote. "If you work the math, it looks like this: We use about 140 billion gallons of gasoline each year, and the payroll tax brings in about 750 billion each year. I realize that there are other things that would get taxed in such a regime, but if you simplify it, it looks like it would take a $5 a gallon tax on gasoline to clear the same amount of money. The guys who favor this never talk specifics, and now I know why-the specifics are incredibly unappetizing."

National Journal attempted last year to survey congressional Republicans on their views on climate change. Sixty-five GOP lawmakers-40 House members and 25 senators across the ideological spectrum-agreed to respond.

Twenty of the 65 Republicans said they think climate change is causing the Earth to warm; 13 said that climate change isn't causing the Earth to warm; and 21 said they didn't know, the science isn't conclusive, or they didn't want to answer the question definitively. Nineteen said that human activities do contribute to climate change-but of those 19, only five said they believed a "significant amount" of climate change was due to human activity, while 14 said they believed human activity contributes "very little" to climate change. Five said they believed that climate change was not at all attributable to human activity.

The biggest obstacle will likely be opposition from influential conservative lobbyist Grover Norquist, president of the group Americans for Tax Reform, who has signed 539 Republican lawmakers and candidates onto a pledge promising never to raise taxes.

"Even a revenue neutral swap would be an extremely bad move for taxpayers," Norquist told National Journal. "It would create a new tax that would certainly grow over time-name a tax that didn't ... and the old tax that was pruned back, would also grow again."

He called the initiative "a very bad idea for taxpayers and is clearly being pushed by advocates of ever-larger government ... with a possible assist from 'conservatives' who have no sense of history."

The true measure of the campaign's success will be whether the issue is championed by key Republican lawmakers, who will have to agree to push for it as part of a tax reform package as well as stand by it

on the campaign trail.

One key Republican with sterling conservative fiscal chops is already doing just that-with backing from an influential tea party group. Rep. Jeff Flake, R-Ariz., the current favorite to become Arizona's next senator next year, supports the idea. In 2009, he co-authored a bill with Inglis to create a carbon tax paired with a cut in the payroll tax. And the bill won backing from the head of the Arizona chapter of Americans for Prosperity, the influential tea party group with ties to the oil company Koch Industries. Another possible backer is Sen. Lisa Murkowski of Alaska, the senior Republican on the Senate Energy and Natural Resources Committee.

Environmentalists and the White House are watching the effort the effort closely. After President Obama's effort to move a cap-and-trade climate change bill through Congress died-and contributed to the losses of many incumbent Democrats in Congress in 2010-Democrat-led efforts to push climate policy are likely to face a wall of opposition in the coming years. Strategists say an effort led by Republicans-a "Nixon goes to China"-type moment-is likely the only chance for moving climate policy before 2016.

"This is an important step. If the U.S. is ever going to get a carbon tax, it has to have a conservative address," said Joshua Freed, director of the clean-energy program at Third Way, a Democratic think tank. "For this to morph from an aspiration into a policy contender, we need the heft of Republicans who hold office and are weighing the impact of reelection to settle in."

BROOKINGS

THE CLIMATE AND ENERGY ECONOMICS PROJECT

CLIMATE AND ENERGY ECONOMICS DISCUSSION PAPER | JULY 24, 2012

THE POTENTIAL ROLE OF A CARBON TAX IN U.S. FISCAL REFORM

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2012-08-054_000000000001793

THE POTENTIAL ROLE OF A CARBON TAX IN U.S. FISCAL REFORM*

JULY 24, 2012

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2012-08-054_000000000001795

EXECUTIVE SUMMARY

This paper examines fiscal reform options in the United States with an intertemporal computable general equilibrium model of the world economy called G-Cubed. Six policy scenarios explore two overarching issues: (1) the effects of a carbon tax under alternative assumptions about the use of the resulting revenue, and (2) the effects of alternative measures that could be used to reduce the budget deficit. We examine a simple excise tax on the carbon content of fossil fuels in the U.S. energy sector starting immediately at $15 per metric ton of carbon dioxide (CO_2) and rising at 4 percent above inflation each year through 2050. We investigate policies that allow the revenue from the illustrative carbon tax to reduce the long run federal budget deficit or the marginal tax rates on labor and capital income. We also compare the carbon tax to other means of reducing the deficit by the same amount.

We find that the carbon tax will raise considerable revenue: $80 billion at the outset, rising to $170 billion in 2030 and $310 billion by 2050. It also significantly reduces U.S. CO_2 emissions by an amount that is largely independent of the use of the revenue. By 2050, annual CO_2 emissions fall by 2.5 billion metric tons (BMT), or 34 percent, relative to baseline, and cumulative emissions fall by 40 BMT through 2050.

The use of the revenue affects both broad economic impacts and the composition of GDP across consumption, investment and net exports. In most scenarios, the carbon tax lowers GDP slightly, reduces investment and exports, and increases imports. The effect on consumption varies across policies and can be positive if households receive the revenue as a lump sum transfer. Using the revenue for a capital tax cut, however, is significantly different than the other policies. In that case, investment booms, employment rises, consumption declines slightly, imports increase, and overall GDP rises significantly relative to baseline through about 2040. Thus, a tax reform that uses a carbon tax to reduce capital taxes would achieve two goals: reducing CO_2 emissions significantly and expanding short-run employment and the economy.

We examine three ways to reduce the deficit by an equal amount. We find that raising marginal tax rates on labor income has advantages over raising tax rates on capital income or establishing a carbon tax. A labor tax increase leaves GDP close to its baseline, reduces consumption very slightly and expands net exports slightly. Investment remains essentially unchanged. In contrast, a capital tax increase causes a significant and persistent drop in investment and much larger reductions in GDP. A carbon tax falls between the two: it lowers GDP more than a labor tax increase because it reduces investment. However, its effects on investment and GDP are more moderate than the capital tax increase, and it also significantly reduces CO_2 emissions. A carbon tax thus offers a way to help reduce the deficit and improve the environment, and do so with minimal disturbance to overall economic activity.

1. INTRODUCTION

Either a carbon pollution tax or a cap-and-trade system can "price carbon."[1] Of the two approaches, a tax may have the better prospects in the United States since Congressional debates over cap-and-trade collapsed in 2010. One option for pricing carbon in the United States would embed a carbon pollution tax within a broader tax reform or budget deficit reduction package. Such an approach could use the revenue from the carbon tax to improve the economic efficiency of the tax system and/or reduce the federal budget deficit, while also reducing the need for costlier regulatory measures to reduce climate-disrupting greenhouse gases.[2] A carbon tax might also allow reductions in subsidies for clean energy technologies since a price on carbon alone can make low-carbon technologies more competitive with their conventional alternatives.

When economists talk about a greenhouse gas (GHG) or carbon tax, they generally have several canonical features in mind. The tax would fall on the carbon content of fossil fuels broadly across the economy and possibly other non-CO_2 GHG emissions. The price signal would start modestly and ramp up gradually in real terms. And the tax program itself would be relatively simple, with few exemptions, complications, and ancillary policies.

In the long run, a tax on the carbon in energy sector fossil fuels will be largely passed forward to consumers through higher prices on energy and higher prices on other goods and services that use energy as an input. Those higher overall real price levels depress the returns to working and investing by shrinking the basket of goods people can buy with their earnings. Because income is already taxed (for example through income, payroll, and capital taxes), the carbon pollution tax introduces another distortion on top of the existing ones. Research suggests this piling on of distortions, known as the "tax interaction effect," can be even more costly than the direct abatement costs.[3]

Policymakers may be able to offset the tax interaction effect by using the carbon tax revenue to reduce other taxes, either now (by lowering marginal tax rates) or in the future (by reducing the federal deficit). In addition to raising revenue, taxes cause "excess burden" or "deadweight loss." These are costs that arise from distortions in behavior that result from the tax. For example, income taxes reduce the returns to working and create a disincentive to work. The higher the marginal tax rate on labor income, the greater the incremental disincentive to work. This tax-induced disincentive to work results in a lower-than-efficient amount of labor supply in

[1] A hybrid approach, such as that proposed by McKibbin and Wilcoxen (2002), could also price carbon.
[2] This paper focuses on a carbon tax, but versions of a cap-and-trade program or hybrid that raise revenue could offer fiscal reforms analogous to the carbon tax scenarios in this paper.
[3] For example, see Goulder et al (1997).

the economy, and that inefficiency is costly. Likewise, taxes on capital income (like the corporate income tax), lower investment which in turn reduces future consumption below what it would have otherwise been.

The deadweight loss produced by the last dollar of revenue that a tax instrument collects is called its "marginal excess burden," and the size of the excess burden can vary significantly across different kinds of taxes. Using carbon pollution tax revenue in a way that reduces marginal tax rates could reduce the excess burden of the fiscal system. This is called "revenue recycling," and some estimates suggest that using carbon pollution tax revenue to lower the deficit or other taxes can lower the overall costs of the program by 75 percent.[4]

The proposition that revenue from an environmental tax could improve the efficiency of the tax system and lower overall costs if it is used to lower other tax rates is called the "weak double dividend" hypothesis. The first dividend is lowering damaging emissions. The second dividend is the potential welfare improvement from revenue recycling relative to a scenario in which the pollution tax revenue is given back to households in a lump sum fashion.[5] The argument is that lump sum rebates don't reduce any of the existing distortions in the tax system, so they don't provide any efficiency gains. Using the carbon tax revenue to reduce the budget deficit could also be a form of efficiency-enhancing revenue recycling because it lowers the tax burdens necessary to support the federal debt.

Feldstein (2006) argues that the distortions from the tax system are greater than most people realize, resulting in costs of about $0.76 for every dollar the federal government raises. Thus in theory, the most efficient form of revenue recycling would offset the most distortionary taxes, meaning the ones that have the highest marginal deadweight loss, now or in the future. Parry and Bento (2000) and Parry and Williams (2011) find that efficiency gains are particularly large when revenue recycling lowers taxes that favor some kinds of consumption (such as housing or health insurance) over others.

Two obvious options are to use the carbon tax revenue to reduce labor income taxes and to reduce capital income taxes. Such tax reforms can substantially offset the regressiveness of the carbon tax and improve the returns to working and saving. For example, a carbon tax could finance a reduction in payroll taxes. Metcalf (2007a) analyzes such a tax swap. He finds that a carbon tax of $15 per metric ton (MT) of CO_2, imposed in 2005, would have raised $78.5 billion and allowed a rebate of the employer and employee payroll taxes on the first $3,660 of earnings per worker, or a maximum rebate if $560 per covered worker. Given payroll tax collections of about $727 billion in 2005, the carbon tax could lower payroll tax burdens on

[4] Parry (1997)

[5] A number of studies have examined the potential for revenue recycling in pricing carbon. For example: Goulder et al. (1999), Parry et al. (1999), Parry and Oates (2000), Parry and Bento (2000), and CBO 2007.

average by just under 11 percent. Metcalf shows this can more than offset the regressivity of the carbon tax.

Revenue from a carbon tax could allow lower marginal tax rates on corporate income. The 2012 President's Framework for Business Tax Reform notes that the U.S. corporate income tax, as a result of its relatively narrow tax base and high statutory tax rate, is "uncompetitive and inefficient."[6] By taxing dividends at both the corporate and personal levels, the current tax code encourages corporations to finance themselves with debt rather than equity, increasing the risk of financial distress, according to the report. The relatively high marginal tax rates encourage corporations to shift their activities out of the United States to a lower tax jurisdiction.

Analyzing a 15 percent cut in emissions from a cap-and-trade program, the U.S. Congressional Budget Office (CBO) estimates that the downward effect on GDP from the program could be reduced by more than half if the government sold allowances and used the revenues to lower corporate income taxes rather than to provide lump-sum rebates to households or to give the allowances away.[7] Metcalf (2007b) analyzes a scenario in which the revenue from a small carbon tax funds corporate tax integration, a reform in which corporate income is taxed only at the personal level. He finds that not only would the tax swap enhance the overall efficiency of the tax system, the corporate tax reform could blunt the consumer price impacts of the carbon tax.

This paper examines tax reform options with an intertemporal computable general equilibrium (CGE) model of the world economy called G-Cubed. We investigate policies that allow the revenue from an illustrative carbon pollution tax to reduce the long run federal budget deficit or the rates of distortionary taxes on labor and capital income. We establish a simple excise tax on the carbon content of fossil fuels in the U.S. energy sector starting immediately at $15 per ton of CO_2 and rising at 4 percent above inflation each year through 2050.[8] We specify the U.S. carbon tax trajectory *a priori* in this way such that it follows a path that minimizes the cost of the cumulative abatement of emissions through 2050. To isolate the effects of the U.S. climate and fiscal policy on the United States, we assume other countries adhere to their baseline emissions trajectories.

[6] Joint Report by the White House and the Department of the Treasury, February, 2012. Downloaded July 23, 2012, from http://www.treasury.gov/resource-center/tax-policy/Documents/The-Presidents-Framework-for-Business-Tax-Reform-02-22-2012.pdf

[7] Elmendorf (2009)

[8] The choice of a tax that begins at $15 per ton of CO_2 is arbitrary; the authors do not mean to suggest that such a price point is socially optimal.

2. MODELING APPROACH

A brief technical discussion of G-Cubed appears in McKibbin et al. (2009) and a more detailed description of the theory behind the model can be found in McKibbin and Wilcoxen (1999) and in McKibbin and Wilcoxen (2012).[9] We use a version of the model that includes the nine geographical regions listed in Table 1 below and the 12 industrial sectors listed in Table 2. The United States, Japan, Australia, and China are each represented by a separately modeled region. The model aggregates the rest of the world into five composite regions: Western Europe, the rest of the OECD (not including Mexico and Korea); Eastern Europe and the former Soviet Union; OPEC oil exporting economies; and all other developing countries.

Table 1: Regions in the G-Cubed Model (Country Aggregation E)

Region Code	Region Description
USA	United States
Japan	Japan
Australia	Australia
Europe	Western Europe
ROECD	Rest of the OECD, i.e. Canada and New Zealand
China	China
EEFSU	Eastern Europe and the former Soviet Union
LDC	Other Developing Countries
OPEC	Oil Exporting Developing Countries

Table 2: Industry Sectors in the G-Cubed Model

Sector Number	Sector
1	Electric Utilities
2	Gas Utilities
3	Petroleum Refining
4	Coal Mining
5	Crude Oil & Gas
6	Mining
7	Agriculture
8	Forestry & Wood

[9] The type of CGE model represented by G-Cubed, with macroeconomic dynamics and various nominal rigidities, is closely related to the dynamic stochastic general equilibrium models that appear in the macroeconomic and central banking literatures.

9	Durables
10	Non-Durables
11	Transportation
12	Services

The Government's Budget Constraint

To describe the baseline and policy scenarios, we first specify G-Cubed's representation of the federal government's budget constraint, which matches the government's outlays to its revenue. In the analysis in this study, government outlays include purchases of goods, services, and labor, along with interest payments on government debt. The first simulation also includes lump sum transfers to households. Government revenue comes from sales taxes, corporate and labor income taxes, and sales of new government bonds. We also include an additional lump sum tax that satisfies a condition called the "no Ponzi game" (NPG) condition. It prevents per capita government debt from growing faster than the interest rate forever, in which case the government would be unable to pay interest on the debt.[10] In addition, some of the simulations include a tax on the carbon content of fossil fuels used in the energy sector.

Mathematically, in any given year the following equates government expenditure to government revenue:

$$G_G + wL_G + R_{LS} + rB = T + t_C Q_C + T_{LS} + D$$

The left hand side sums outflows from the government in value terms:

- G_G government spending on goods and services
- wL_G government spending at (tax inclusive) wage w on quantity of labor wL_G
- R_{LS} lump sum transfers to households
- rB interest payments on the stock of federal bonds B at interest rate r

The right hand side sums sources of income to the government:

- T tax revenue from all taxes other than carbon taxes
- $t_C Q_C$ carbon pollution tax revenue on emissions Q_C
- D net government borrowing via the fiscal deficit

[10] Implicitly we assume that agents will not hold government bonds unless they expect the bonds to be paid off eventually. The binding NPG condition means that at any point in time the current level of debt will always be exactly equal to the present value of future budget surpluses. McKibbin and Wilcoxen (1999) present the equivalent intertemporal constraint: the transversality condition on the stock of debt.

The Baseline Scenario

In the baseline, exogenous variables include the deficit *D*, and the tax rates included in *T*. The baseline scenario includes no lump sum transfers to households, so R_{LS} is identically zero. The stock of bonds *B* is determined by the accumulation of past deficits. Wages, prices of goods and services, and the interest rate on government debt are all endogenous. Each region's real government spending on goods and services is exogenous and allocated across inputs in fixed proportions according to their values in 2010. Government labor demanded, L_G, is also exogenous in the baseline.

A model's assumptions (or in the case of G-Cubed, its endogenous projections) about future emissions and economic activity in the absence of climate policy is called the baseline scenario. A detailed discussion of the baseline in G-Cubed appears in McKibbin, Pearce and Stegman (2009). The baseline in this study is broadly consistent with the emissions and GDP growth in the Department of Energy's Updated *Annual Energy Outlook* Reference Case Service Report from April 2011.[11] It sets G-Cubed's projected productivity growth rates so that the model's baseline results approximate the report's forecasts for U.S. real gross domestic product (GDP) and other key variables.

Along with the baseline for the U.S., we construct a baseline scenario for the other regions in the world that reflects our best estimate of the likely evolution of each region's economy without concerted climate policy measures. To generate this scenario, we begin by calibrating the model to reproduce approximately the relationship between economic growth and emissions growth in the U.S. and other regions over the past decade. In the baseline, neither the U.S. nor other countries adopt an economy-wide price on carbon through 2050.

The Policy Scenarios

We use the G-Cubed model to analyze six policy scenarios that allow us to compare deficit reductions via a carbon tax and increases in labor and capital taxes as well as deficit neutral tax shifts.

In all the policy simulations, we hold the real value of government spending on goods, services, and labor ($G_G + wL_G$) at baseline levels. As we discuss later in this paper, assumptions about how government spending changes (or not) as a result of a carbon tax have important implications for consumption-based measures of household welfare. That's because a carbon tax can lower wages. If government labor quantity demanded is exogenous (as is typically

[11] The report appears at the DOE's Energy Information Administration website: http://www.eia.doe.gov/oiaf/servicerpt/stimulus/index.html.

assumed) and wages fall, then the carbon tax induces lower government spending on labor and lower total government consumption. Thus lower wages in the policy simulation effectively shrink the burden of the government and expand consumption by households. This particular beneficial outcome for household welfare doesn't arise directly from the carbon tax but rather by its indirect effects on the overall size of government. To isolate the effect of the carbon tax on welfare independent of changes in the overall burden of supporting government, we hold government spending in these simulations to its baseline by imposing an endogenous lump sum tax that is just the right size to finance baseline government spending.

The first policy scenario imposes a carbon tax whose revenue is rebated lump sum to households. It includes essentially no other important fiscal changes. The second scenario applies the carbon tax revenue to deficit reduction. The third and fourth scenarios achieve the same deficit reductions as the second, but do it with increases in the labor income tax and the capital income tax, respectively. The fifth and sixth scenarios use carbon tax revenues to fund deficit neutral decreases in taxes on labor and capital income, respectively. Here are the details:

1. Carbon tax with lump sum rebate.

This scenario establishes a simple excise tax on the carbon content of fossil fuels in the U.S. energy sector starting immediately at $15 per ton of CO_2 and rising at 4 percent above inflation each year through 2050. We specify the carbon tax trajectory *a priori* in this way such that it follows a path that minimizes the cost of emissions abatement.

In each year of the simulation, government spending, the federal budget deficit, and tax rates on sales, corporate income, and labor income are held at the same levels as in the baseline. The government returns the revenue from the carbon tax to households with the lump sum rebate.

Each year's total rebate to households will be slightly different than the carbon tax revenue due to the general equilibrium effects of the carbon tax. For example, if the carbon tax slows economic activity and lowers the revenue from other taxes, some of the carbon tax revenue the government must retain some of the carbon tax revenue to finance government spending (held at baseline levels) without increasing the deficit.

The carbon tax can also induce a change in the composition of economic activity across categories with different tax treatment and change the relative prices of different inputs to government spending.

2. Carbon tax with deficit reduction.

This scenario imposes the same tax on carbon emissions as Scenario 1, but applies the revenue towards deficit reduction. As in Scenario 1, we hold total government spending and non-

carbon tax rates at their baseline levels. A key difference in outcomes between this simulation and Scenario 1 is that this scenario produces lower government deficits and debt owing to the revenue of the carbon tax. It means that the interest payments on the debt fall, and the NPG tax embedded in *T* will be smaller than in Scenario 1.

There are no lump sum rebates to households; all of the carbon tax revenue applies towards deficit reduction. However, the decline in the deficit relative to baseline will differ slightly from the carbon tax revenue due to general equilibrium effects.

3. Deficit reduction via an increase in tax rates on labor income

4. Deficit reduction via an increase in tax rates on capital income

Scenarios 3 and 4 allow us to compare deficit reductions via a carbon tax with other ways to reduce the deficit by the same amount. These simulations exogenously set the deficit to the lower-than-baseline trajectory achieved in Scenario 2.

Scenario 3 endogenously determines the (larger than baseline) tax rate on labor income each year such that the increase in labor income tax revenue produces exactly the same (lower than baseline) deficit that obtained in Scenario 2.

Scenario 4 does the same thing as Scenario 3 with the tax rate on capital income rather than the tax rate on labor income.

There are no carbon taxes or lump sum rebates in Scenarios 3 and 4.

Because these simulations determine tax rates on labor and capital endogenously each year to hit a particular deficit target, they are best thought of as diagnostic scenarios rather than realistic policy scenarios.

5. Carbon tax with reduction in tax rates on labor income.

6. Carbon tax with reduction in tax rates on capital income.

Scenarios 5 and 6 apply revenue from a carbon tax to finance reductions in the tax rates on labor and capital income. The deficit and government spending are held exogenously to baseline levels. The same carbon tax as Scenario 1 applies.

Scenario 5 endogenously determines the (lower than baseline) tax rate on labor income each year such that net result of the decrease in labor income tax revenue and the increase in revenue from the carbon tax produces exactly the deficit in the baseline for that year. Scenario 6 does the same thing as Scenario 5 with decreases in the tax rates on capital income instead of the tax rates on labor income.

In these simulations the deficits and debt are the same as in the baseline and Scenario 1. There are no lump sum rebates to households. As in the other simulations, the revenue from the carbon tax and the reduction in other tax revenues would differ slightly due to general equilibrium effects.

Table 3 below summarizes the key features of the scenarios.

Table 3: Summary of Baseline and Policy Scenarios

Scenario	Carbon Tax	Deficit	Labor tax rate	Capital tax rate	Lump Sum Rebate
Baseline	no	exogenous	exogenous	exogenous	no
1	Yes, tax on the carbon in fossil fuels in the U.S. energy sector, starting immediately at $15 per ton of CO_2, rising at 4% real each year through 2030	baseline	baseline	baseline	yes
2	same as Scenario 1	falls relative to baseline	baseline	baseline	no
3	no	same decline as Scenario 2	Higher than baseline	baseline	no
4	no	same decline as Scenario 2	baseline	Higher than baseline	no
5	same as Scenario 1	baseline	Lower than baseline	baseline	no
6	same as Scenario 1	baseline	baseline	Lower than baseline	no

The comparative general equilibrium effects of these scenarios are of particular interest. For example, the tax swap scenarios (5 and 6) use the carbon tax revenue to reduce other distortions in the economy. This raises the question of whether the net effect of these fiscal reforms on employment, consumption, and GDP will be positive or negative.

The carbon tax in Scenarios 1, 2, 5, and 6 increases at the long term real interest rate, a trajectory known as a "Hotelling path" after the work of Harold Hotelling. Hotelling (1931) showed that the price of an exhaustible resource grows at the real interest rate when owners maximize the value of their resource over the extraction period. A Hotelling path has the property that it minimizes the present value of the abatement cost of achieving a specified reduction in cumulative emissions. In each year, polluters will reduce emissions whenever the marginal cost of doing so is less than the carbon price. If the carbon price rises at the real interest rate, then present value cost of the last unit abated in each future period will be equal, which is precisely the condition required for minimizing the present value cost of a fixed quantity of abatement.

The greenhouse gas emissions included in G-Cubed comprise only CO_2 from energy-related fossil fuel consumption including combustion of coal, natural gas, and oil. This represents a large majority of total U.S. greenhouse gas emissions and the vast majority of emissions growth since 2000. For example, according to the U.S. Environmental Protection Agency, fossil fuel combustion comprised 94 percent of all U.S. CO_2 emissions in 2008, and over 80 percent of gross U.S. greenhouse gas emissions on a CO_2-equivalent basis.[12]

3. RESULTS

The six policy scenarios explore two overarching issues: (1) the effects of a carbon tax under alternative assumptions about the use of the resulting revenue, and (2) the effects of alternative measures that could be used to reduce the budget deficit. Simulations 1, 2, 5 and 6 address the first issue and share a common carbon tax. Simulations 2, 3 and 4 address the second issue and share a common reduction in the deficit. Each issue will be discussed in turn below. The labels for the scenarios in the figures below abbreviate the scenarios according to Table 4. The figures also label the baseline scenario as "Base."

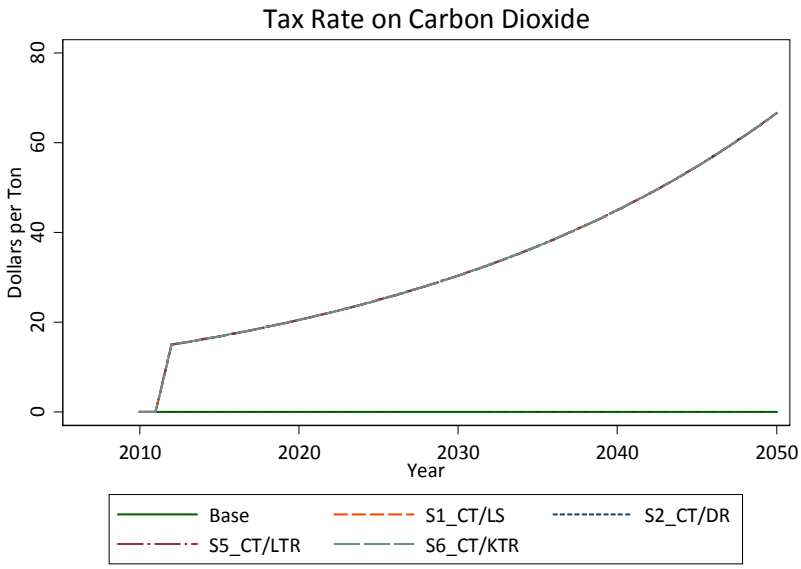
[12] U.S. Environmental Protection Agency (2010), *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008*, p. ES-4, Table ES-2. Accessed on July 8, 2010: http://epa.gov/climatechange/emissions/downloads10/US-GHG-Inventory-2010_ExecutiveSummary.pdf.

Table 4: Policy Scenario Abbreviations in Figures

Scenario	Scenario Description	Abbreviation
1	Carbon tax (CT) with lump sum (LS) rebates	S1_CT/LS
2	Carbon tax (CT) with deficit reduction (DR)	S2_CT/DR
3	Deficit reduction (DR) via increase in labor tax (LT)	S3_LT/DR
4	Deficit reduction (DR) via increase in capital tax (KT)	S4_KT/DR
5	Carbon tax (CT) with reduction in labor tax rates (LTR)	S5_CT/LTR
6	Carbon tax (CT) with reduction in capital tax rates (KTR)	S6_CT/KTR

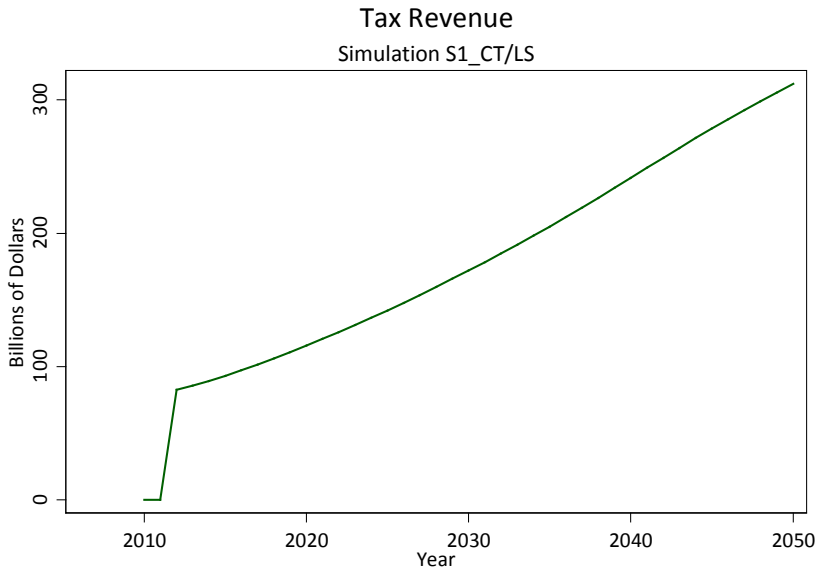
Scenarios 1, 2, 5 and 6 all include a tax on CO_2 emissions that begins in 2012 at $15 per metric ton and rises at a real rate of 4 percent per year. Figure 1 shows the constant-dollar tax rate through 2050.

Figure 1



As shown in Figure 2 for Scenario 1, the tax raises considerable revenue: $80 billion at the outset rising to $170 billion in 2030 and $310 billion by 2050.

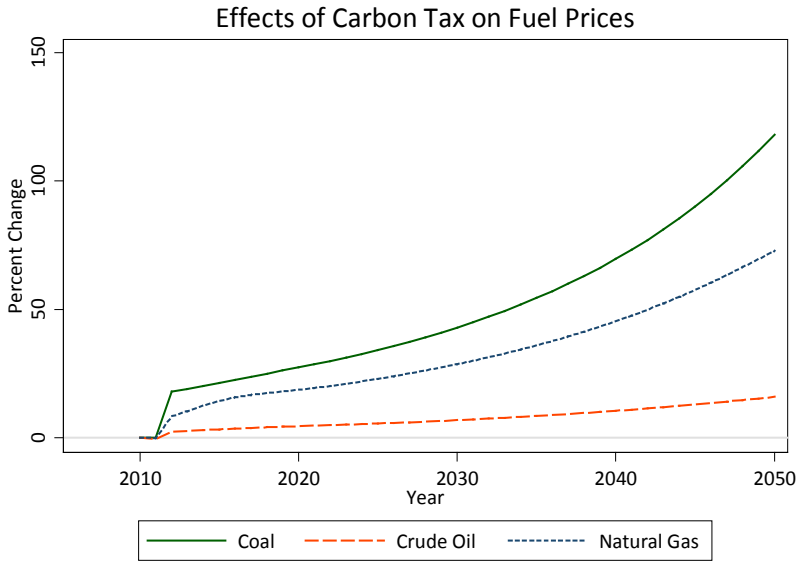
Figure 2



Carbon Tax Policies: Lump Sum Rebates

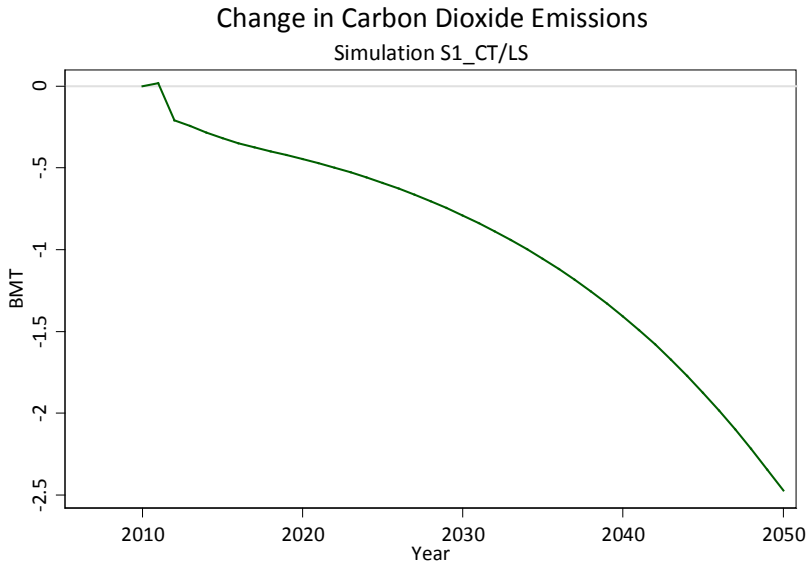
To keep the discussion concise, we will present Scenario 1 in detail and then discuss the key differences that arise with alternative uses of the revenue in simulations 2, 5 and 6. The immediate effect of the carbon tax is to raise purchaser's prices of coal (sector 4), crude oil (sector 5), and natural gas (sector 6). Figure 3 shows the effect of the tax on the prices of the three fuels to domestic buyers. Each curve shows the percentage change in the price of the fuel relative to its value in the base case. The price of coal rises most in percentage terms due to its high carbon content and low price per unit of energy. In contrast, crude oil prices change least in percentage terms. Although oil has higher carbon content per unit of energy than natural gas, its pre-tax price per unit energy is higher. That means that as a percentage of its pre-tax price, the carbon tax is smaller for oil than natural gas.

Figure 3



The tax reduces annual CO_2 emissions significantly, as shown in Figure 4. By 2050, annual emissions fall by 2.5 billion metric tons (BMT) of CO_2, or 34 percent, relative to baseline. The cumulative reduction in emissions relative to the base case through 2050 is 40 billion metric tons (BMT).

Figure 4



The effects of the tax on prices at the industry level for a representative year, 2030, are shown in Figure 5. For each sector, three prices are shown: in green are producer prices, which exclude any tax on the producer's output; in red are domestic purchaser's prices, the producer's price plus the carbon tax; and in blue are the final supply prices, which are a composite of domestic and import purchaser's prices.

As noted above, the immediate effect of the tax is to raise purchaser's prices for coal (sector 04), crude oil (05) and natural gas (06). Supply prices for crude oil and natural gas rise slightly less than domestic prices because the exchange appreciates (discussed further below). Downstream, the increase in purchaser's prices raises costs for electricity (01) and refined petroleum (03) and prices rise as a result. There is little change in the price of gas utilities (02), because it includes pipeline and delivery costs but not the value of the gas itself. Costs and prices rise slightly for transportation (11) as a result of higher refined oil prices. Prices in the remaining sectors fall very slightly due to declines in real wages and appreciation of the dollar. The percentage change in the exchange rate relative to the base case is shown in Figure 6; a positive value corresponds to strengthening of the U.S. dollar.

Figure 5

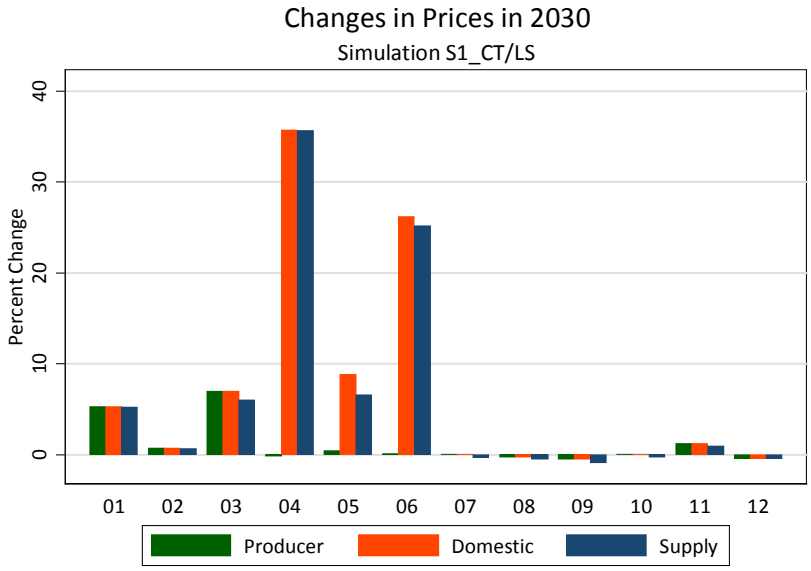
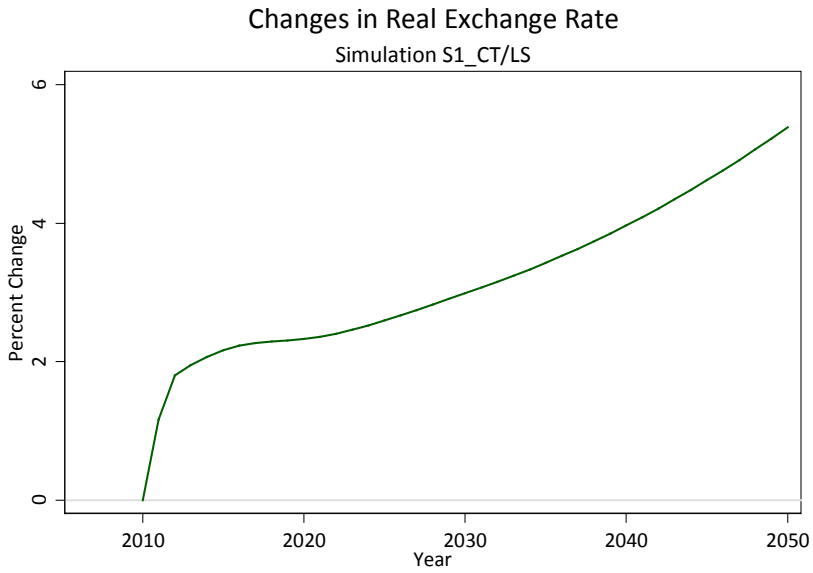


Figure 6



Changes in 2030 domestic production and total supply of each good are shown in Figure 7. Primary energy production falls by more than 10 percent for coal (04) and natural gas (06). Production of crude oil (05) falls by about 7 percent and production of refined oil falls about 6 percent (03). Due to the appreciation of the exchange rate, imports of crude oil and natural gas are reduced by more than domestic production. As a result, total supply (shown in red) falls by more than domestic output for those sectors. Outside the energy sectors, reductions in output are modest, with the largest effect occuring in transportation (11).

Figure 7

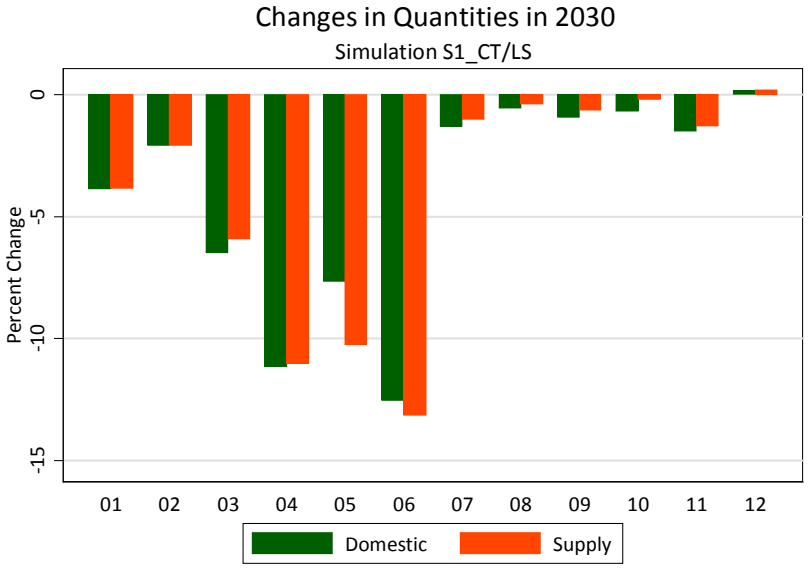


Figure 8 shows the impact of the price and quantity changes on total revenue to producers (shown in green) and total payments by buyers (shown in red for domestic production and blue for total supply). Revenue falls by 8 to 10 percent for producers of coal (04), crude oil (05) and natural gas (06). Expenditure on those goods, inclusive of the tax, rises by more than 20 percent for coal (04) and by more than 10 percent for natural gas (06). Expenditure on the total supply of crude oil (05) actually falls slightly (blue bar) because appreciation of the exchange rate offsets a significant part of the tax increase.

Figure 8

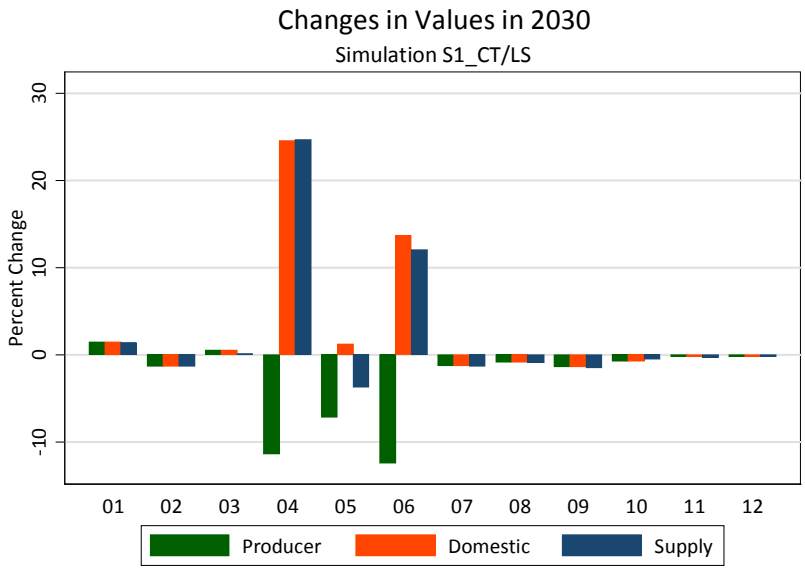
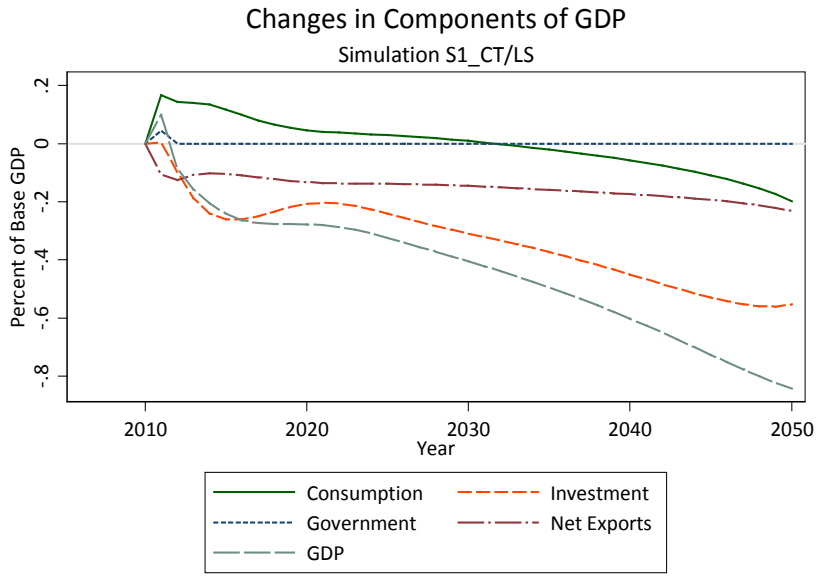


Figure 8 turns to the economy as a whole by showing the change the policy produces in real GDP and its four components: consumption, investment, government spending, and net exports. The figure shows the GDP component variables as percentages of baseline GDP, which allows straightforward comparisons of their magnitudes and easy decomposition of the overall GDP effect. The carbon tax lowers GDP slightly relative to the baseline by reducing investment and net exports in every year. In the early years of the simulation, those reductions are partly offset by an increase in consumption. Government spending is fixed to baseline levels by design in all of the policy scenarios.

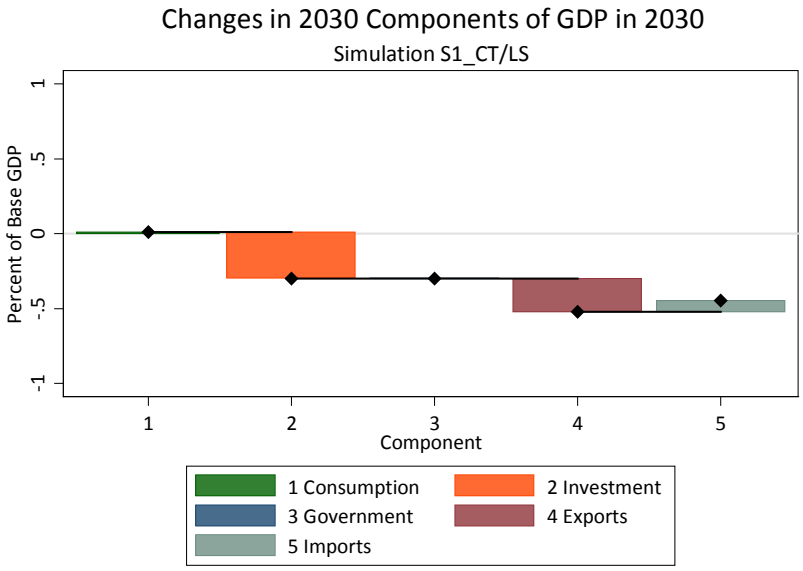
Figure 9



Other than in the earliest years, the change in GDP is dominated by declines in investment and net exports. Figure 10 uses a cumulative sequence of bars to illustrate the composition of changes in real 2030 GDP. The short green bar at the left shows the decline in consumption in terms of baseline 2030 GDP. The effect is very small: real consumption in 2030 is essentially unchanged from the base case. Each subsequent bar begins at the end of the previous bar, which is marked by a small black diamond and horizontal line. The bar shows the *additional* increase or decrease attributable to the indicated component. For example, investment falls relative to the base case, so the red bar for component 2 starts where the change in consumption ended (shown by the black line at the top of the investment bar) ends lower, with the black diamond on the investment bar indicating a reduction of 0.3 percent of base GDP.

Moving further to the right, real government spending is held constant by construction, and exports fall relative to the base case by 0.2 percent of GDP. Imports fall as well (indicated by an upward movement of GDP with the light blue bar), and this increases GDP by 0.1 percent of its baseline value. The overall change in GDP is indicated by the black diamond on the right most bar, and is a reduction of about 0.4 percent.

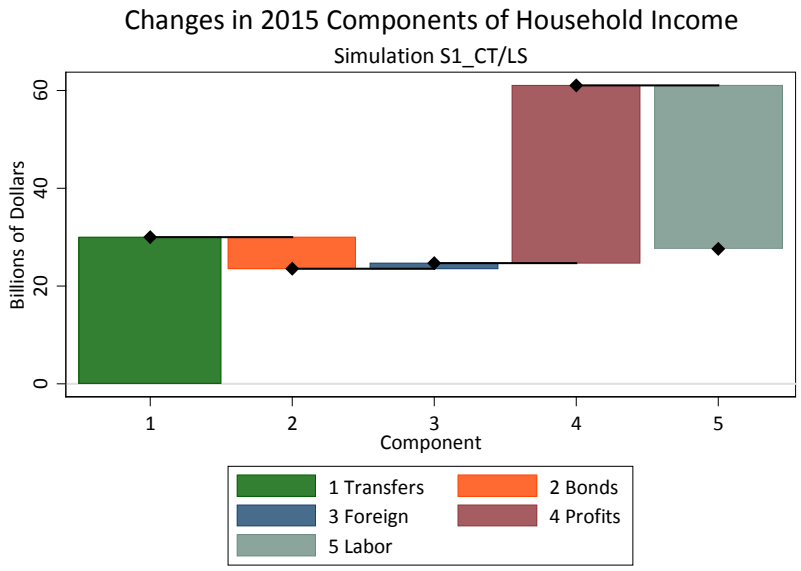
Figure 10



Through about 2025 real consumption is slightly above its baseline because net household income rises slightly and the liquidity-constrained households consume more. Figure 11 shows how the policy affects the components of real household income in 2015: transfers (including in Simulation 1 the lump sum rebates from the carbon tax); income from government bonds; net income from foreign bonds; profits; profits; and labor income.

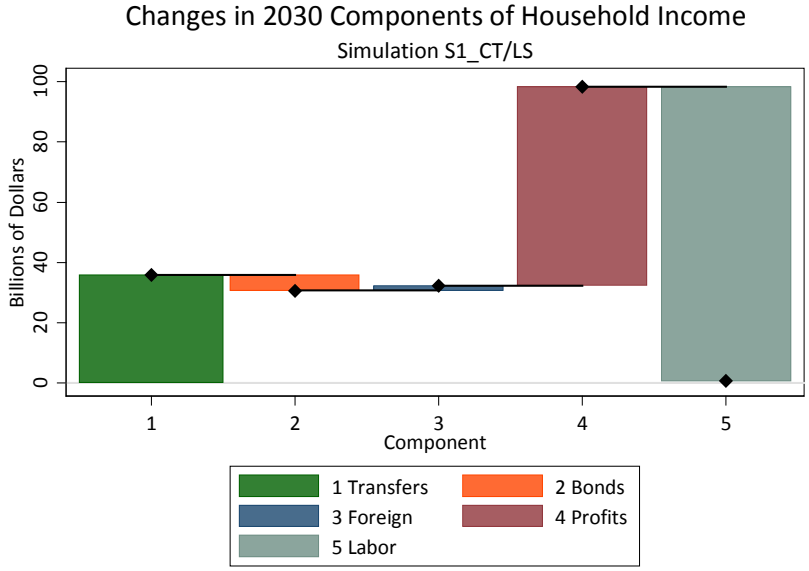
Transfers increase relative to the base case by about $30 billion. Income from government bonds falls modestly and income from net holdings of foreign bonds increases very slightly. Profits, in contrast, rise by more than $30 billion (discussed in more detail below). The top of the profits bar indicates that if there been no further effects, household income would have risen by $60 billion relative to the base case. However, the final component, labor income, falls by almost as much as income from profits rises. Thus, the four components other than transfers largely balance out. The overall change in income, shown by the black diamond on the right-most bar, is essentially the same height as the transfer alone.

Figure 11



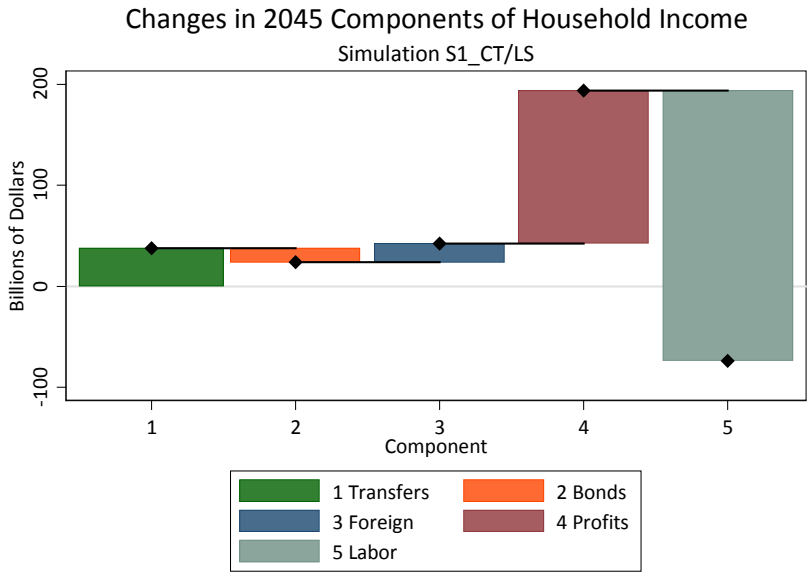
By 2030, the magnitude of each effect increases but the changes are not proportional. As shown in Figure 12, the reduction in labor income increases significantly relative to the others. In fact, the reduction in labor income relative to the base case is large enough to completely offset the transfer as well as the increase in profits. As a result, real income in 2030 is essentially unchanged from its base case value (the right-most diamond lies very close to 0).

Figure 12



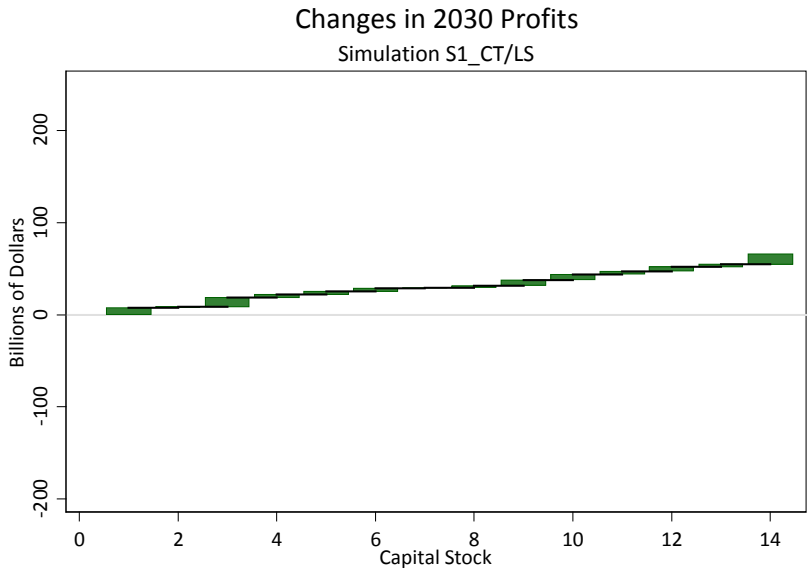
By 2045, reduced labor income exceeds the increases in other components and overall income falls, as shown in Figure 13. As indicated in Figure 9, the real value of consumption falls as a result.

Figure 13



The overall increase in profits across the U.S. economy is the sum of small increments in the returns to capital associated with each sector's capital stock. Profits in each sector are its revenues minus its costs of energy, labor, materials, and investment. Figure 14 is a cumulative sequence of bars showing increases in real returns in 2030 in 14 sectors. The first 12 are the producing sectors listed in Table 2, followed by the capital stock associated with the capital goods industry (13) and the household capital stock (14). For clarity, the black diamonds used to mark the top of each bar in previous graphs have been omitted but the horizontal lines connecting the end of one bar to the beginning of the next are shown. Also, the vertical scale is set to allow convenient comparisons with other simulations discussed later.

Figure 14



The reasons for the increase in profits that result from the policy vary by sector. For example, Figure 15 decomposes the change in 2030 profits for electric utilities (sector 1) into revenues and the four cost categories. As shown in Figure 8, the real value of electricity sales in 2030 rises slightly relative to the base case. The increase in revenue appears in Figure 15 as the green bar at the left. The cost of energy inputs rises, reducing profits by the amount shown by the orange bar. The change in energy costs is more than double the increase in revenue so in the absence of other changes, profits would have fallen by about $7 billion (the diamond on the energy bar). However, labor and materials costs both fall as output drops, and this partly offsets the decline in profits due to higher energy costs. Finally, as shown by the gray bar at the far right, short-run profits also rise because real spending on new investment declines. Labor and investment costs decline in part because the policy reduces real wages and the price of new capital goods, as shown in Figure 16. In addition, investment costs also decrease because the sector grows more slowly and fewer new capital goods are needed. Overall, the increase in revenue and the reductions in labor, materials, and investment costs more than offset the increase in costs associated with energy inputs and real profits rise.

Figure 15

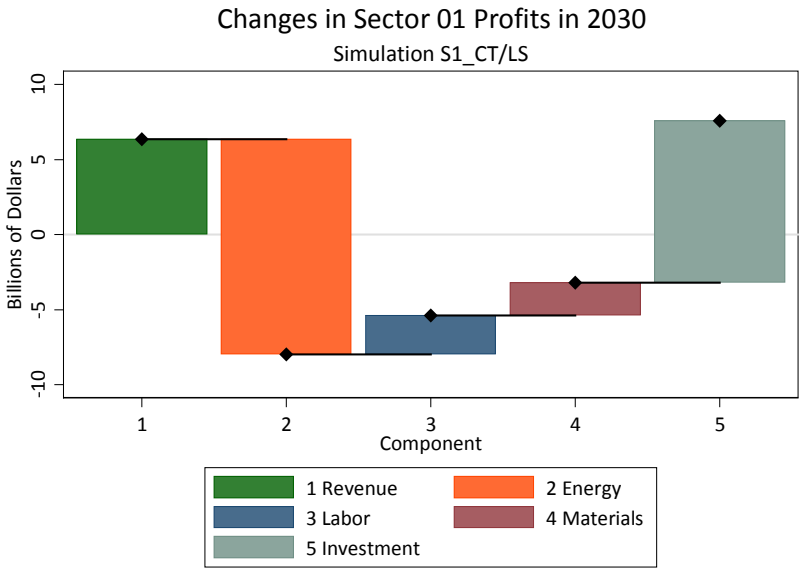
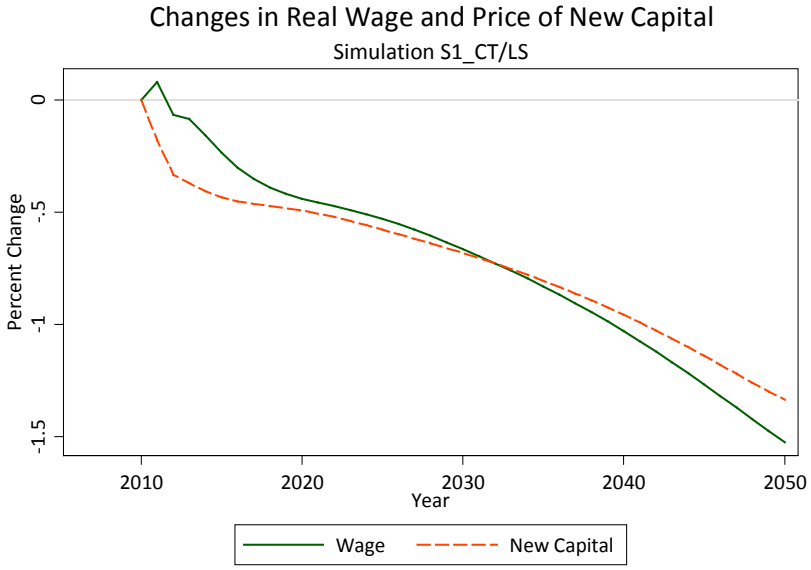
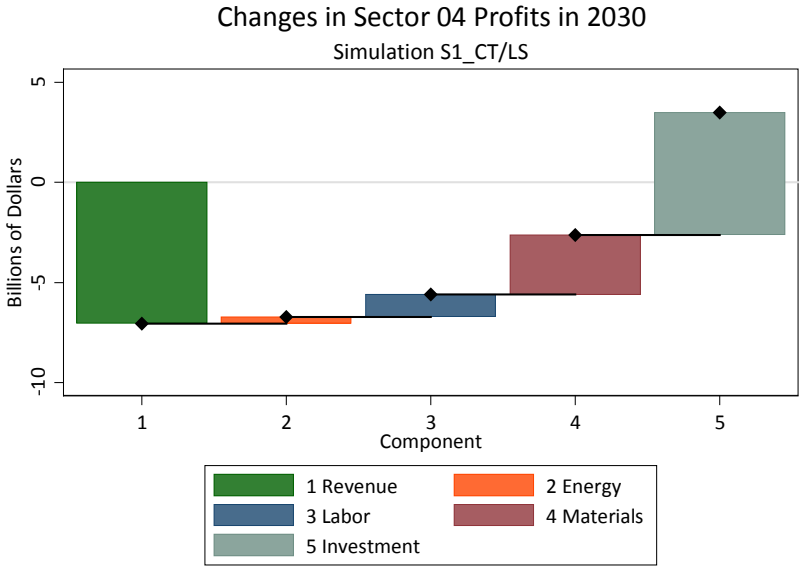


Figure 16



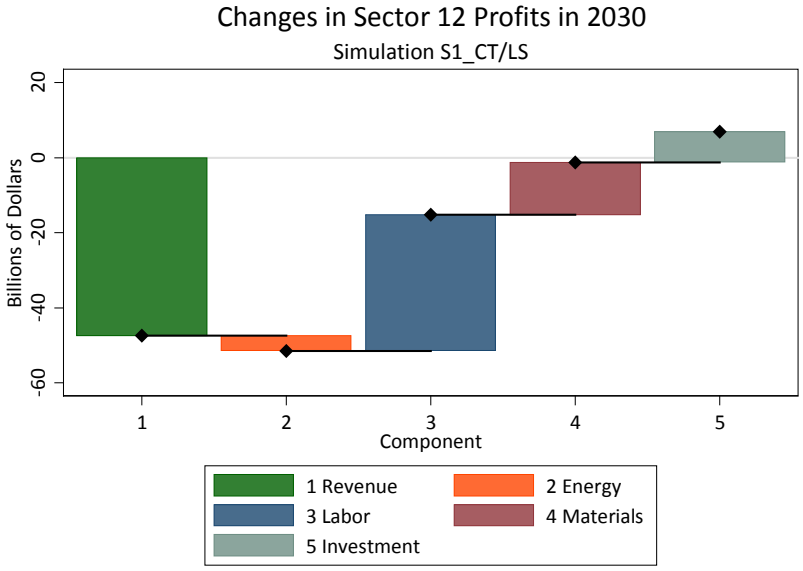
The results for the primary energy sectors differ from the electricity sector but investment costs play a key role there, too. Figure 17 decomposes the change in 2030 profits for the coal industry (sector 4). As shown earlier in Figure 8, revenue falls significantly. Reductions in spending on energy, labor and materials partially offset the drop. However, investment spending drops sharply and short run profits rise slightly overall.

Figure 17



In the service sector, shown in Figure 18, reductions in labor costs driven by a decline in the real wage play a more important role. Investment spending is slightly lower due to a drop in the price of new investment goods but it is a much smaller contribution.

Figure 18



Percentage changes in real 2030 spending on energy, labor and investment are shown for all sectors in Figure 19 through Figure 21. Energy expenses increase for electric utilities and most of the non-energy sectors. Labor and investment costs fall for all sectors, with the largest percentage decrease in the energy sectors directly affected by the carbon tax. Investment spending in coal, crude oil and natural gas extraction falls by more than 60 percent relative to the base case.

Figure 19

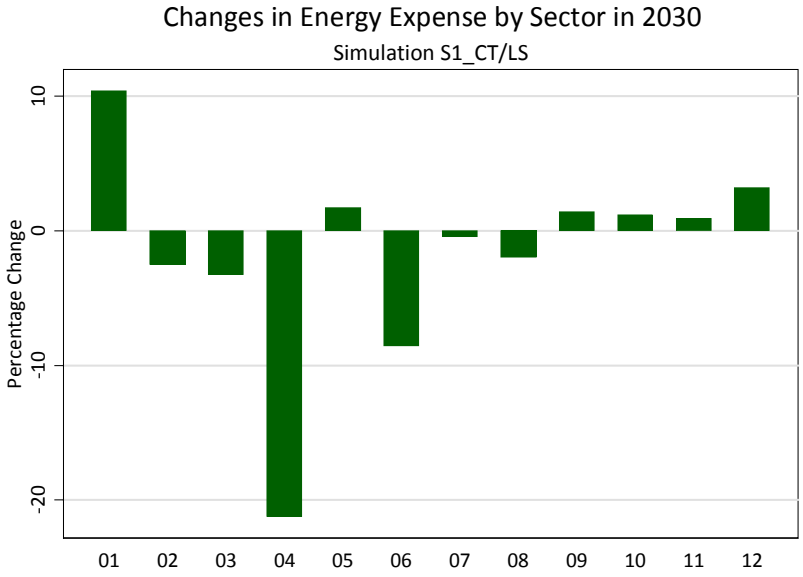


Figure 20

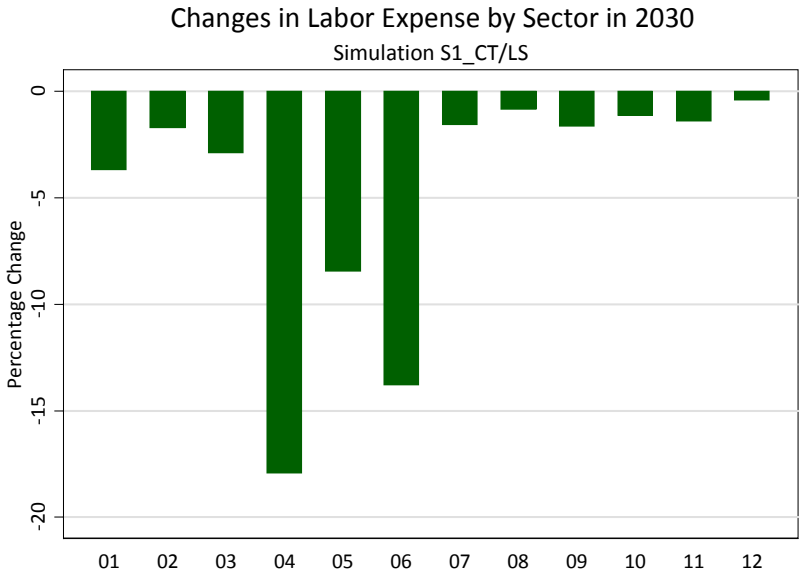
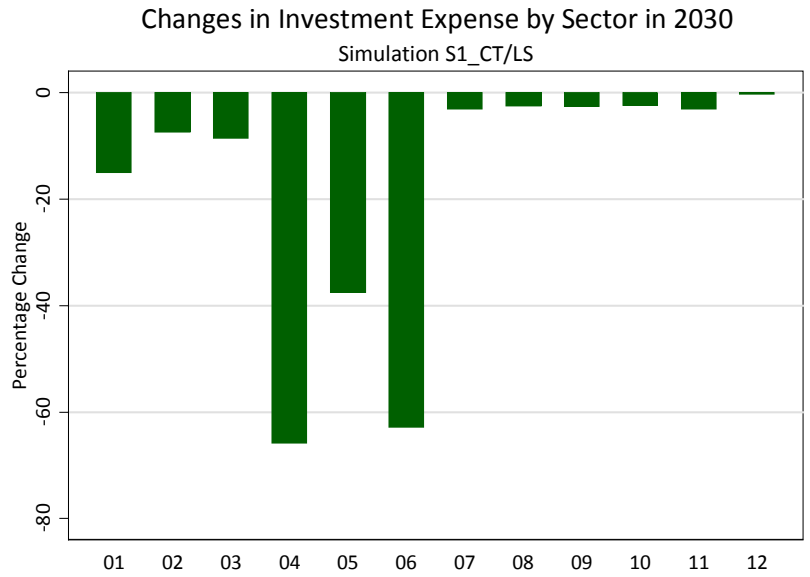


Figure 21

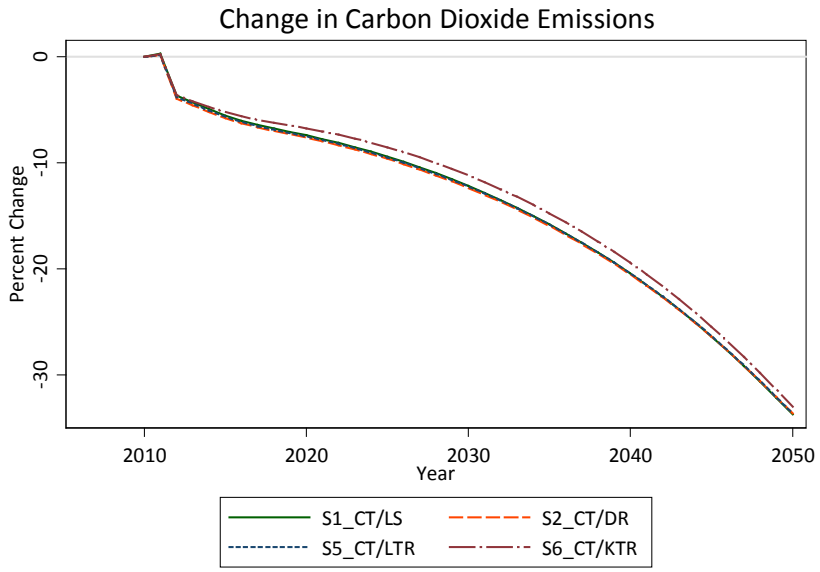


Overall, the carbon tax with a lump-sum rebate reduces GDP slightly and shifts its composition away from investment and net exports and toward consumption.

Alternative Uses of Carbon Tax Revenue: Comparing Scenarios 1, 2, 5 and 6

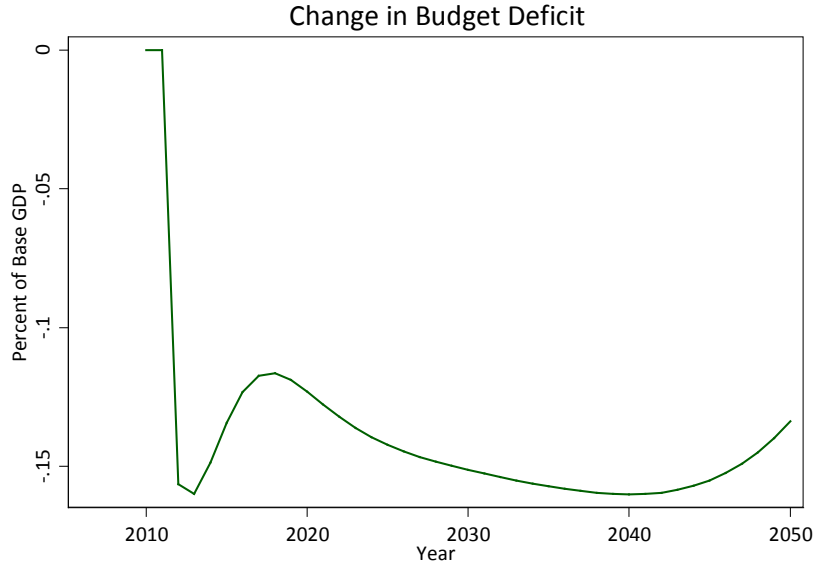
Figure 22 shows that all four of the carbon tax scenarios (Scenarios 1, 2, 5, and 6) achieve similar annual reductions in emissions, suggesting that the management of the revenue has little effect on the environmental performance of the policy. By 2050, cumulative emissions in scenarios 1, 2 and 5 are all 40 billion metric tons lower than the base case. Under scenario 6, the expansion in economic activity from the capital tax swap causes the cumulative reduction to be slightly less—38 billion metric tons.

Figure 22



A carbon tax of the magnitude used in Scenario 1 could allow significant reductions in the budget deficit or modest reductions in the tax rates on labor or capital income. As shown in Figure 23, the budget deficit under Scenario 2 is lower by about 0.15 percent of baseline GDP. The decrease is immediate and relatively constant for the duration of the policy.

Figure 23



As shown in Figure 24, the carbon tax allows the labor tax rate under Scenario 5 to be reduced by about 0.3 percentage points while holding the deficit constant. Under Scenario 6, the capital tax rate could be reduced by almost 6 percentage points in the long run, as shown in Figure 25.

Figure 24

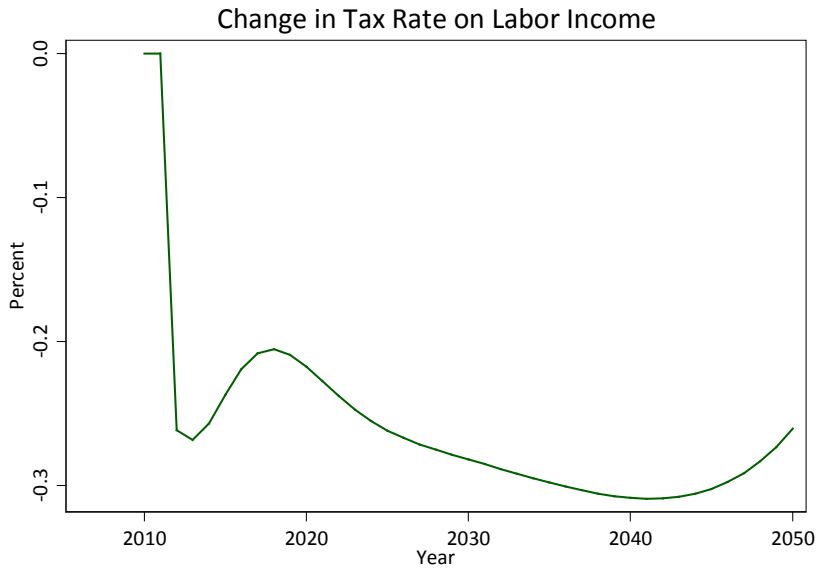
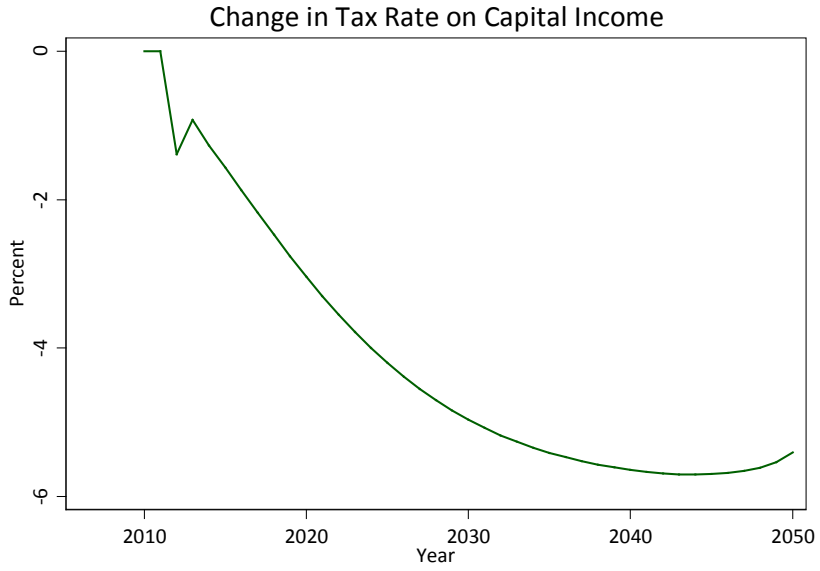


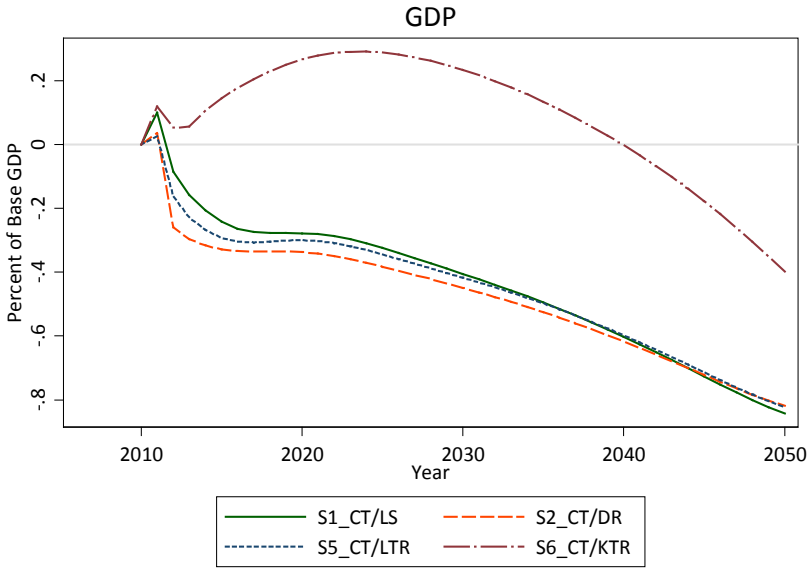
Figure 25



Using the revenue from the carbon tax for deficit reduction or tax reform affects the pattern of changes in GDP and its components. Figure 26 shows the change in GDP relative to baseline under all four of the carbon tax scenarios: the lump sum case in green, the deficit reduction

case in red, the labor tax reduction in blue, and the capital tax reduction in brown. The first three simulations are similar overall, although deficit reduction and the labor tax rebate lower GDP slightly more than the lump sum rebate in the early years. The capital tax reduction stands in sharp contrast: it raises GDP above the baseline for several decades.

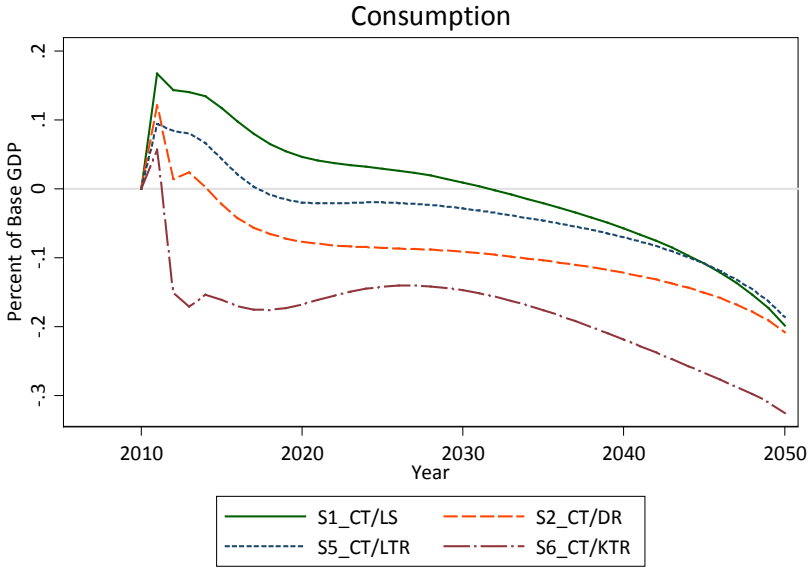
Figure 26



In terms of GDP, then, the capital tax swap appears to produce a double dividend, i.e. both emissions reductions and an increase in economic activity.

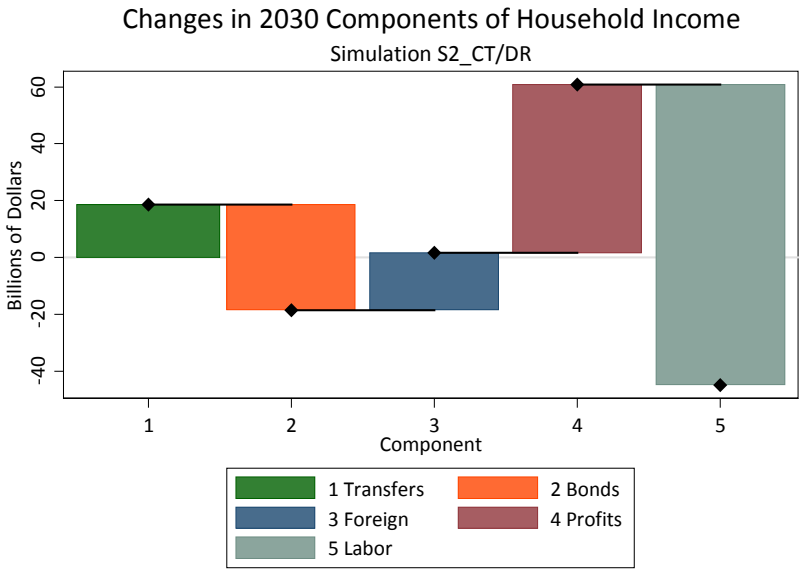
The components of GDP vary across scenarios as well, and there the differences between the first three simulations become more pronounced. Figure 27 shows the effects of the policies on real consumption, one measure of the welfare effects of the policies. All three of the alternatives to lump sum rebates are less positive for consumption. Under deficit reduction or the labor tax reduction, initial consumption rises less than under the lump sum case and quickly falls below its baseline (although by a small amount: less than 0.1 percent of GDP). Under the capital tax rebate, consumption drops sharply and remains lower than all of the other scenarios.

Figure 27



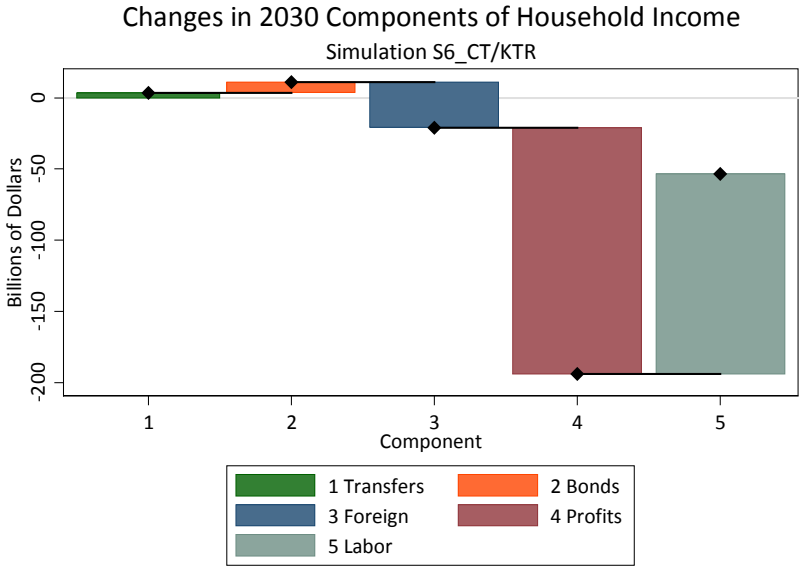
Consumption is lower under Scenarios 2, 5 and 6 in part because households do not receive the large lump sum transfer of income that occurs in Scenario 1. For example, Figure 28 shows the composition of changes in real income in 2030 under the deficit reduction scenario. Transfers rise slightly due to reductions in the cost of servicing government debt. Income from government bonds falls as the stock of debt declines relative to the base case, and income from foreign assets rises slightly. Together, the first three changes roughly balance: the diamond on the third bar is very close to 0. However, the changes in profits and real wages induced by the carbon tax are largely unaffected and result in a net drop of about $40 billion. As a result, overall income falls and consumption declines.

Figure 28



The mechanisms at work in the capital tax swap scenario are quite different. Figure 29 shows the corresponding changes in the components of income in 2030. The policy induces small increases in transfers and income from bonds, and a modest decrease in income from foreign assets. The main effects, however, are a large reduction in profits and an accompanying increase in labor income. Overall, household income falls.

Figure 29



Labor income in Scenario 6 rises largely because the real wage rises, and to a lesser extent because employment rises. Figure 30 shows the effects of the scenarios on real wages over time, and Figure 31 shows effects on employment; both are measured as percentage changes from their base case values. The first three scenarios are very similar to one another but boom in investment under scenario 6 drives up the demand for labor significantly.

Figure 30

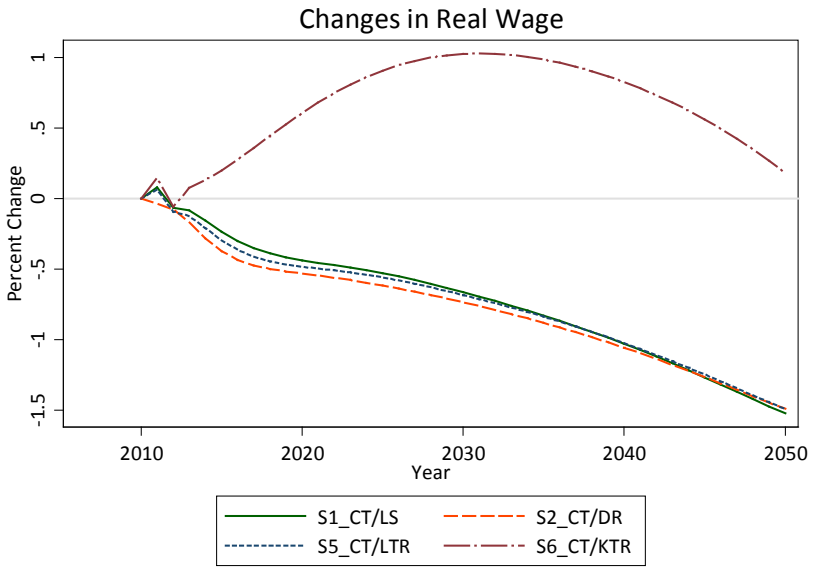
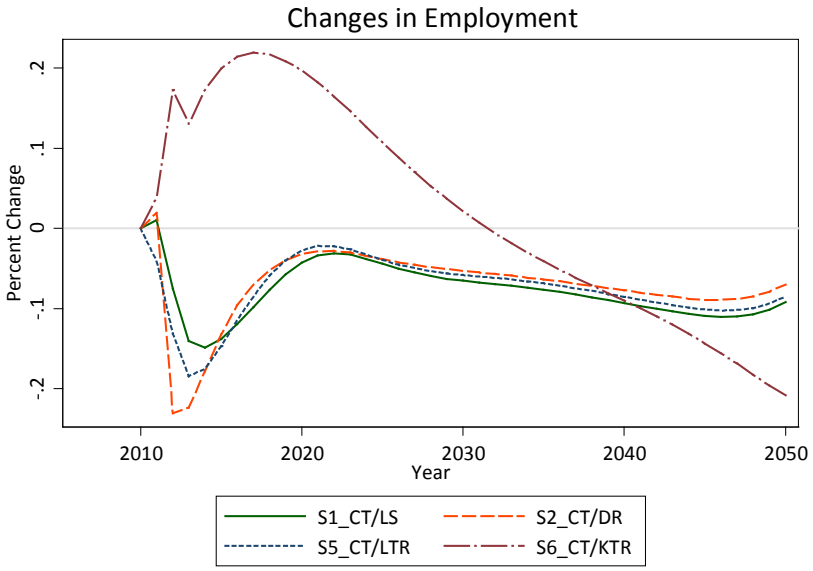
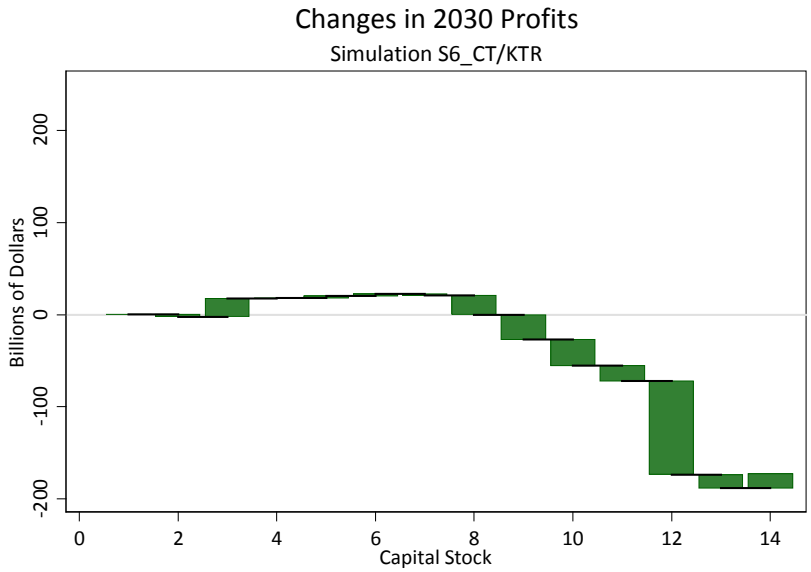


Figure 31



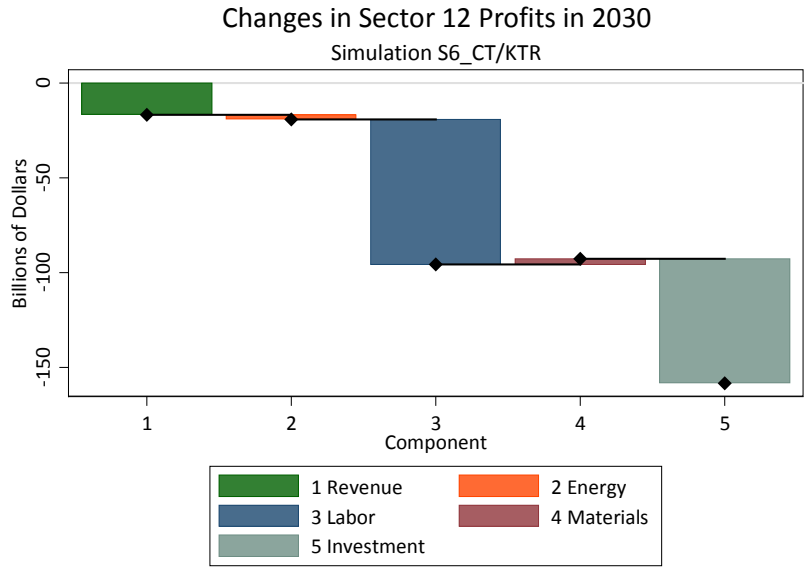
The decline in profits can be decomposed by capital stock as shown in Figure 32. There is a modest increase in the profitability of petroleum refining (sector 3) but declines in profits in sectors 8-12, as well as in the production of new capital goods (13).

Figure 32



The largest decline in profits occurs in the service sector. As shown in Figure 33, the drop results largely from increases in labor costs and increases in spending on investment.

Figure 33



Investment increases in the other sectors as well and, as shown in Figure 34, total investment rises relative to the base case by about 0.5 percent of baseline GDP for about the first 20 years of the policy.

Figure 34

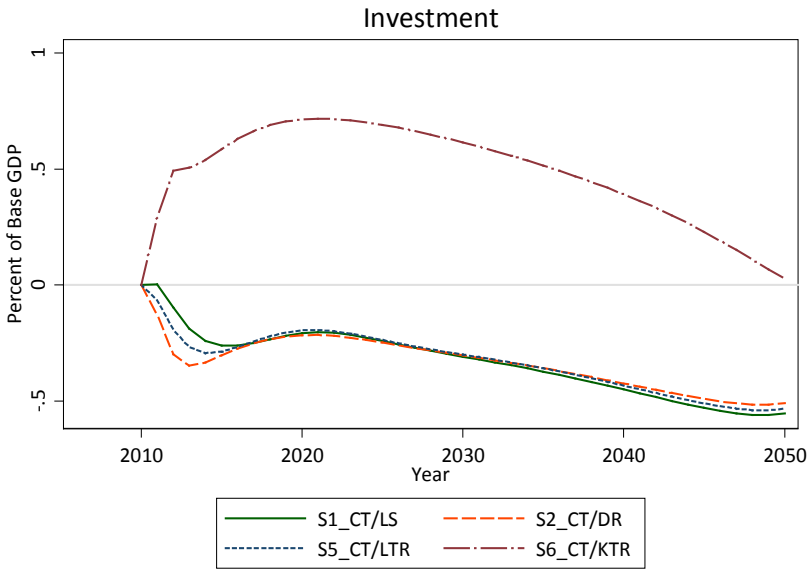
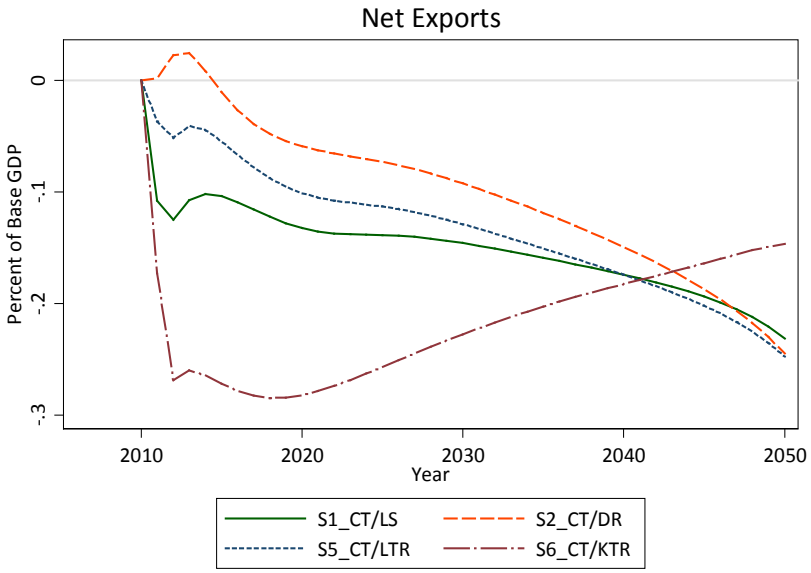


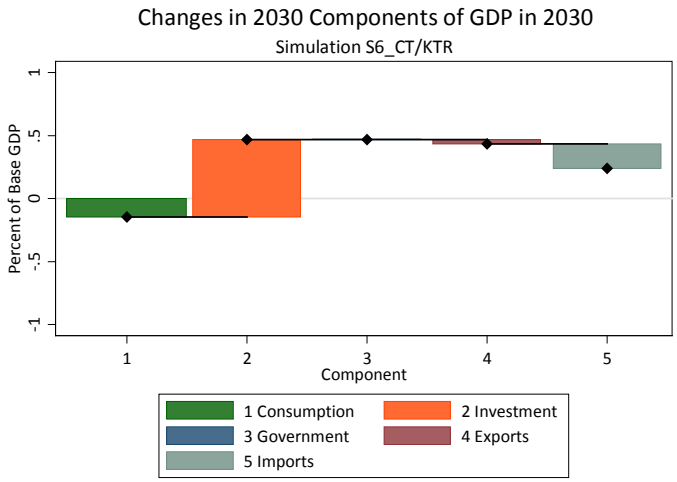
Figure 35 shows the policies have pronounced differences in their effects on net exports. Under rebates, deficit reduction, and labor tax reduction, exports and imports both fall, and the drop in imports partially offsets the fall in exports, as Figure 10 illustrates for Scenario 1.

Figure 35



Under the capital tax, however, imports rise substantially, augmenting the fall in GDP associated with the drop in exports. In fact, Figure 36 shows that the increase in imports (shown by the light blue decline in GDP) can be significantly larger than the decrease in exports. In essence, the capital tax reduction causes a boom in investment and a significant rise in the demand for imports.

Figure 36



In sum, a carbon tax will significantly reduce CO_2 emissions, and the environmental performance of the policy is largely independent of the use of the revenue. However, how the revenue is used has important effects on the economy broadly and the allocation of GDP across consumption, investment and net exports. For most of the simulations, the carbon tax tends to lower GDP slightly, reduce investment and exports, and increase imports. The effect on consumption varies by policy and can be positive if household receive the revenue as a lump sum transfer. Using the revenue for a cut in tax rates on capital income, however, is substantially different than the other revenue policies. In that case, investment booms, employment rises, consumption declines slightly, imports increase, and overall GDP rises significantly relative to baseline levels. Thus, adopting a carbon tax and using the revenue to reduce capital taxes would achieve two goals: reducing CO_2 emissions significantly and expanding short-run employment and the economy.

Deficit Reduction Policies

Scenarios 2, 3 and 4 all reduce the budget deficit by the amount achieved via the carbon tax in Scenario 2 (shown in Figure 23). The carbon tax in Scenario 2 is shown in Figure 1. Figure 37 and Figure 38 show the increases in the marginal tax rates on labor and capital income (Scenarios 3 and 4) that reduce the deficit by the same amount. Figure 37 shows the labor tax

must about 0.3 percentage points higher, while Figure 38 shows the capital tax rate would need to be about 6 percentage points higher in the long run than in the baseline.

Figure 37

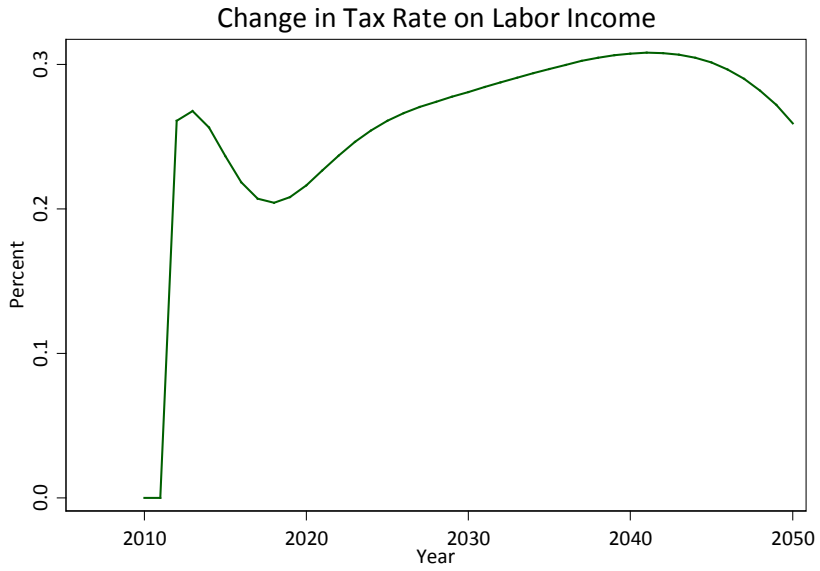
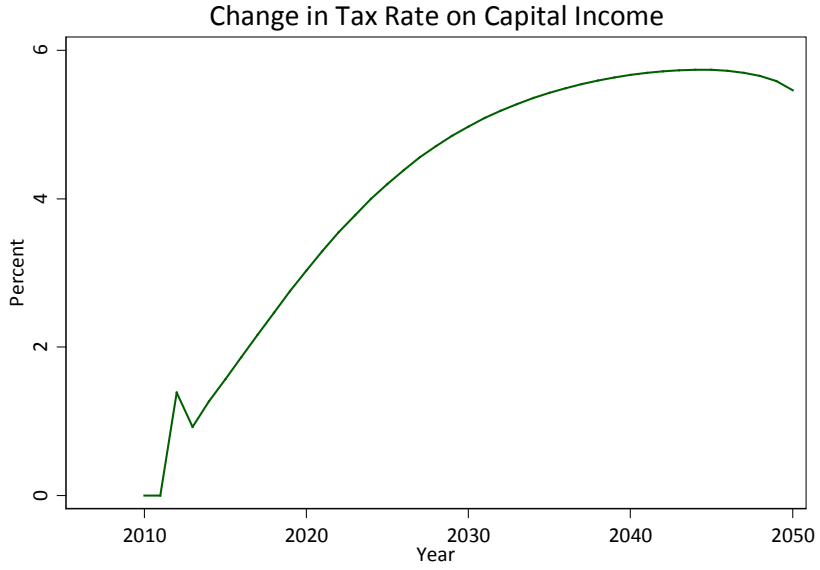
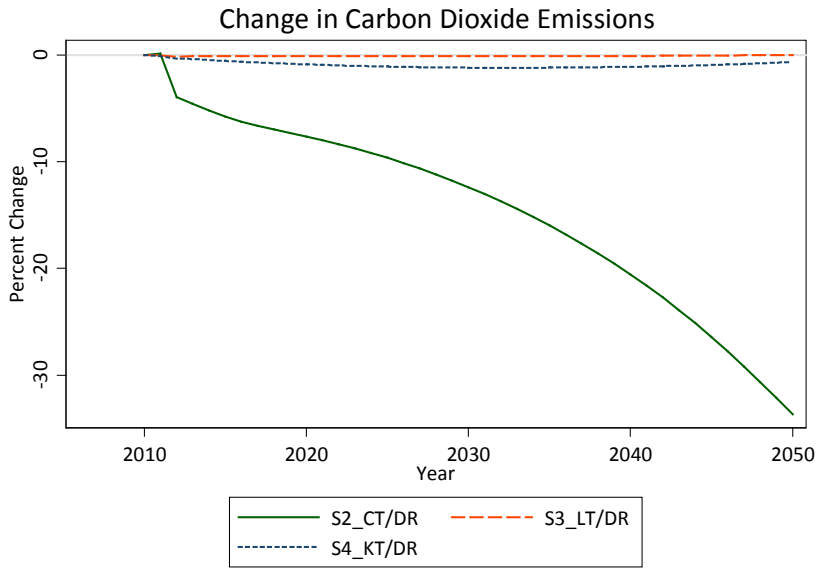


Figure 38



Of the three policies, only the carbon tax has a meaningful effect on CO_2 emissions. As shown in Figure 39, annual emissions under the capital tax increase fall very slightly relative to the base case, and emissions under the labor tax increase are essentially unchanged.

Figure 39



As shown in Figure 40, the effects of the deficit reduction scenarios on GDP differ significantly. The carbon tax, shown in green, reduces GDP by about 0.3 percent of its baseline level in the short run and by about 0.7 percent in the long run. In contrast, an equivalent reduction via an increase in the labor tax produces almost no drop in GDP. The capital tax causes a significantly larger drop in GDP than either of the other policies in the short run but long run effect is smaller than the carbon tax.

An interesting feature of the results is that none of the policies improve long term GDP. The reasons are threefold: (1) the risk premium on government securities in the model is unaffected by reductions in the deficit; (2) international capital in-flows limit crowding out of private investment; and (3) a large share of households are forward-looking and exhibit Barro-neutrality. [13]

The risk premium is unaffected due to two interlocking features of the simulations. First, our baseline scenario does not include explosive growth in transfer payments under federal entitlement programs. As a result, baseline government debt stabilizes as a share of GDP. Second, and consistent with the first point, we treat the risk premium associated with U.S.

[13] Barro (1974)

government debt as exogenous and constant. Thus, deficit reduction has only minor general equilibrium effects on the interest rate paid by the government. Future work will relax both of these assumptions to raise baseline transfers sharply and to adjust the risk premium on U.S. government debt accordingly. Under those circumstances, deficit reduction will have an additional benefit to the economy and may raise GDP above its baseline.

A related issue arises with international capital flows. G-Cubed includes risk premia on foreign debt but the rates are exogenous. As a result, both the U.S. government and the private sector have access to a very elastic supply of international capital. Relatively high borrowing by the government does little to crowd out private investment.

Finally, the forward-looking households in the model are Barro-neutral and regard deficit spending as equivalent to the present value of future payments required to finance it. Thus, they are generally indifferent to deficit reductions matched by reductions in future taxes. This neutrality would change if the risk premium on debt were endogenous; in that case, the combination of deficit reduction and lower future taxes would produce a gain in present value wealth for households.

Figure 40

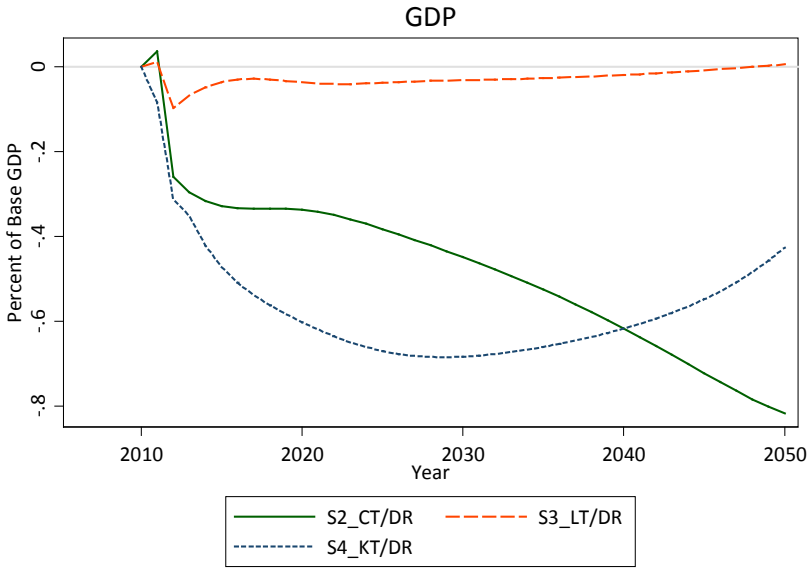


Figure 41 decomposes Scenario 2's GDP results in 2030. The largest effect is a decline in investment of 0.3 percent of baseline GDP. Augmenting that are declines of 0.2 and 0.1 percent of GDP in exports and consumption, respectively. The declines are partially offset by a fall in imports, which raises GDP by about 0.1 percent of its baseline level. Figure 40 shows, on

the same vertical scale, that the labor tax increase has a similar effect on consumption but almost no effect on other components of GDP.

Figure 41

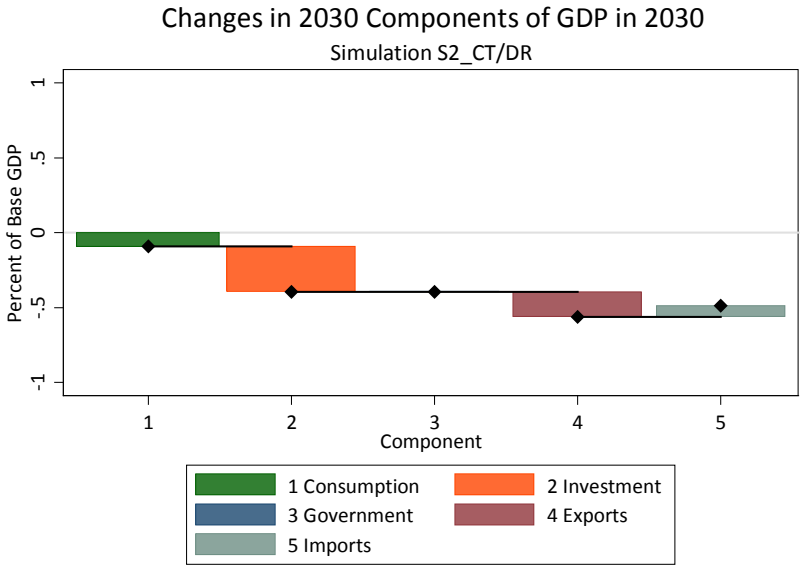
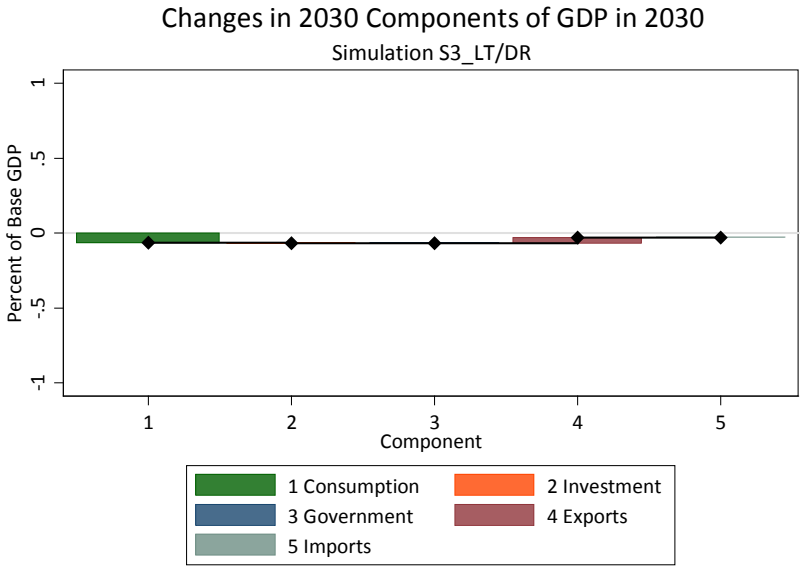
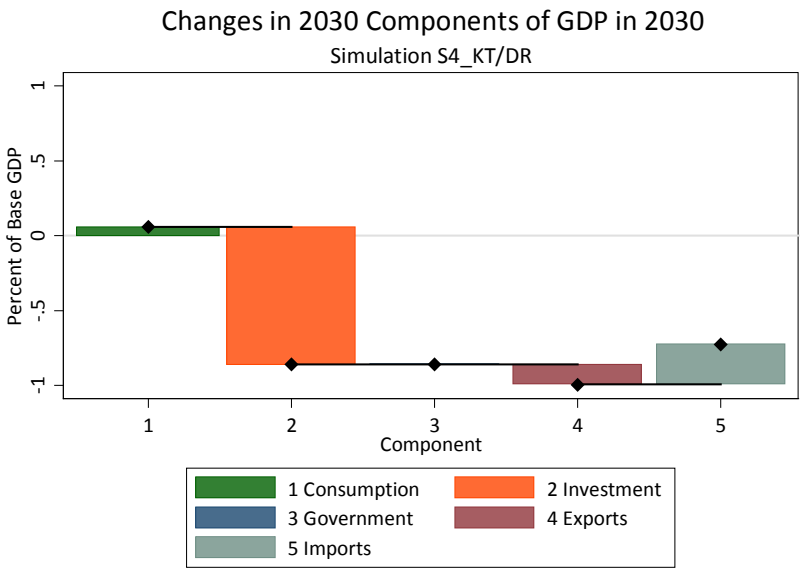


Figure 42



The capital tax, shown in Figure 43 (also using the same vertical scale), reduces GDP largely because it discourages investment which is lower by almost 1 percent of baseline GDP. It also lowers exports by about 0.1 percent of GDP but that is more than offset by a reduction in imports that raises GDP by almost 0.3 percent. Consumption also rises but by less than 0.1 percent of base GDP.

Figure 43



The evolution of consumption, investment and net exports over time are shown in Figure 44, Figure 45, and Figure 46. Consumption is persistently slightly above its baseline value under the capital tax scenario while it is lower in most years under the carbon and capital taxes. The effects on investment are also roughly comparable over time: there is little effect under the labor tax, a large decline under the capital tax, and a modest decline under the carbon tax. Finally, in the short run the capital tax causes a boom in net export s by lowering imports significantly. In the long run, however, exports decline and offset part of the gain.

Figure 44

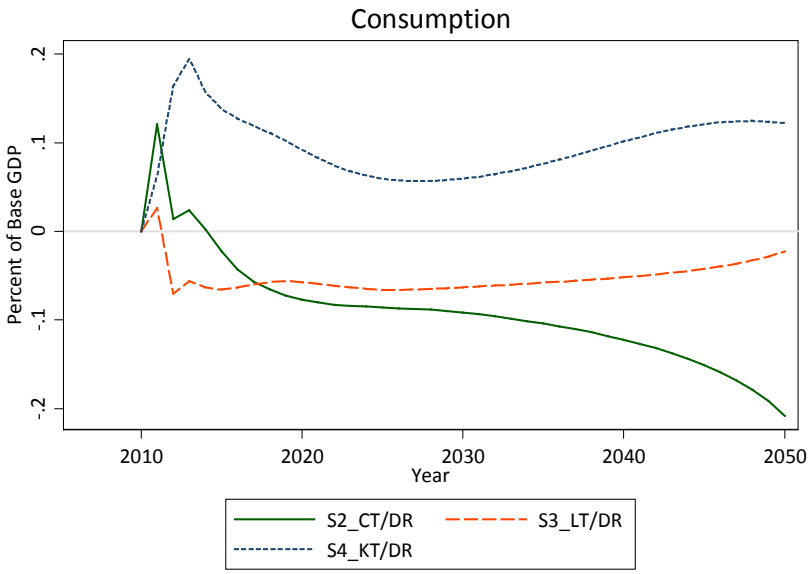


Figure 45

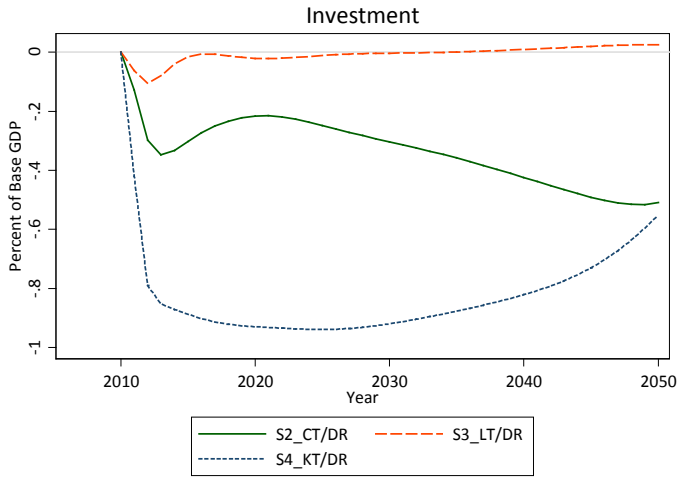
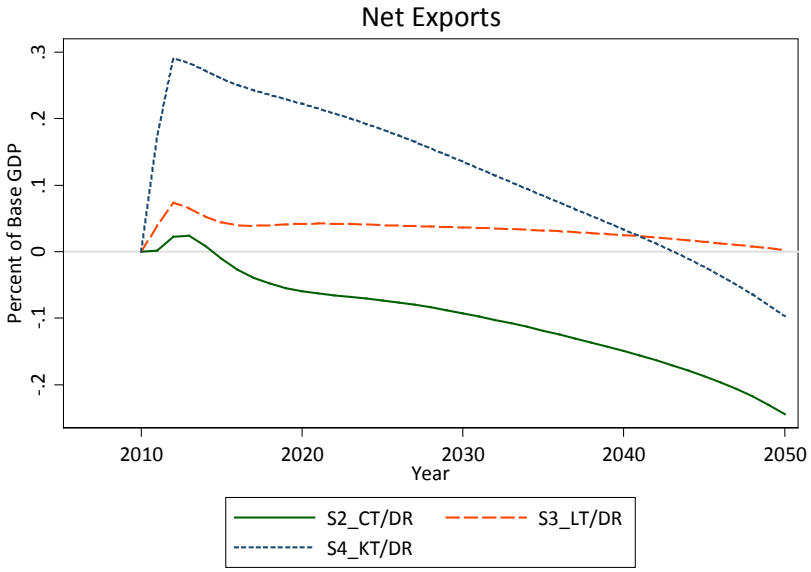


Figure 46



In sum, we find that raising taxes on labor is the best approach for reducing the deficit with minimal disturbance to the overall economy. GDP remains very close to its base case level, consumption is reduced very slightly and net exports expand slightly. Investment remains essentially unchanged. In contrast, increasing tax rates on capital income to reduce the deficit causes a significant and persistent drop in investment and much larger reductions in GDP. A carbon tax falls between the two: it produces a larger decline in GDP than a labor tax increase since (as discussed above) it reduces investment. However, it has much more moderate effects on investment and GDP than the capital tax increase, and it also provides a very significant reduction in CO_2 emissions. A carbon tax offers the option to help reduce the deficit and

improve the quality of the environment, and to do so with minimal disturbance to overall economic activity.

4. CONCLUSION

This paper examines fiscal reform options in the United States with an intertemporal computable general equilibrium model of the world economy called G-Cubed. The six policy scenarios explore two overarching issues: (1) the effects of a carbon tax under alternative assumptions about the use of the resulting revenue, and (2) the effects of alternative measures that could be used to reduce the budget deficit. We examine a simple excise tax on the carbon content of fossil fuels in the U.S. energy sector starting immediately at $15 per metric ton of CO_2 and rising at 4 percent above inflation each year through 2050. We investigate policies that allow the revenue from the illustrative carbon tax to reduce the long run federal budget deficit or the marginal tax rates on labor and capital income. We also compare the carbon tax to increases in labor and capital income taxes that reduce the deficit by the same amount.

We find that the carbon tax will significantly reduce CO_2 emissions, and the environmental performance is largely independent of the use of the revenue. By 2050, annual emissions fall by 2.5 billion metric tons (BMT) of CO_2, or 34 percent, relative to baseline. The cumulative reduction in emissions relative to the base case through 2050 is 40 BMT.

The use of the carbon tax revenue affects the policy's broad economic impacts as well as the composition of GDP across consumption, investment and net exports. For most of the scenarios, the carbon tax tends to lower GDP slightly, reduce investment and exports, and increase imports. The effect on consumption varies across policies and can be positive if households receive the revenue as a lump sum transfer.

Using the revenue for a cut in the marginal tax rates on capital income, however, is significantly different than the other policies. In that case, investment booms, employment rises, consumption declines slightly, imports increase, and overall GDP rises significantly relative to baseline through about 2040. Thus, adopting a carbon tax and using the revenue to reduce capital taxes would achieve two goals: reducing CO_2 emissions significantly and expanding short-run employment and the economy.

We examine three ways to reduce the deficit: a carbon tax, an increase in tax rates on labor income, and an increase in tax rates on capital income. We find that raising marginal tax rates on labor income has advantages over the other two approaches. With the labor tax increase, GDP remains very close to its base case level, consumption is reduced very slightly and net exports expand slightly. Investment remains essentially unchanged. In contrast, using a capital tax to reduce the deficit causes a significant and persistent drop in investment and much larger

reductions in GDP. A carbon tax falls between the two: it has a larger effect on GDP than a labor tax increase since (as discussed above) it reduces investment. However, it has much more moderate effects on investment and GDP than the capital tax increase, and it also provides a very significant reduction in CO_2 emissions. A carbon pollution tax thus offers a way to help reduce the deficit and improve the quality of the environment with minimal disturbance to overall economic activity.

REFERENCES

Barro, R., 1974, "Are government bonds net wealth?" *Journal of Political Economy*, 82, pp. 1095-1117.

Congressional Budget Office, "Trade-Offs in Allocating Allowances for CO_2 Emissions," CBO Economic and Budget Issue Brief, April 25,2007, http://www.cbo.gov/ftpdocs/89xx/doc8946/04-25-Cap_Trade.pdf.

Elmendorf, Douglas W. Director, Congressional Budget Office, *The Distribution of Revenues from a Cap-and-Trade Program for CO_2 Emissions* , testimony before the Committee on Finance United States Senate. May 7, 2009.

Feldstein, Martin, "The Effect of Taxes on Efficiency and Growth," NBER Working Paper No. 12201, May 2006, http://www.nber.org/papers/w12201.pdf?new_window=1

Goulder, L.H., I. Parry, and D. Burtraw. 1997. Revenue-Raising versus Other Approaches to Environmental Protection: The Critical Significance of Preexisting Tax Distortions. *RAND Journal of Economics* 28(4): 708-731.

Goulder, L.H., I.W.H. Parry, R.C. Williams III, and D. Burtraw. 1999. The Cost-Effectiveness of Alternative Instruments for Environmental Protection in a Second-Best Setting. *Journal of Public Economics* 72(3): 329–60.

Hotelling, H., "The Economics of Exhaustible Resources," *Journal of Political Economy*, Vol. 39, No. 2 (Apr., 1931), pp. 137-175.

McKibbin W., D. Pearce and A. Stegman (2009) "Climate Change Scenarios and Long Term Projections" *Climate Change*, 97(1-2), pp 23-47.

McKibbin, W., A. Morris, P. Wilcoxen, and Y. Cai (2009), "Consequences of Alternative U.S. Cap-and-Trade Policies: Controlling Both Emissions and Costs," The Brookings Institution, June. http://www.brookings.edu/~/media/Files/rc/reports/2009/07_cap_and_trade/0727_cost_containment.pdf

McKibbin, W. J. and P. J. Wilcoxen (1999), "The Theoretical and Empirical Structure of the G-Cubed Model," *Economic Modelling,* 16(1999), pp. 123-148.

McKibbin W.J and P.J. Wilcoxen (2002) *Climate Change Policy after Kyoto: A Blueprint for a Realistic Approach,* Brookings Institution, December, 133 pages

McKibbin W and Wilcoxen P (2012), A Global Approach to Energy and the Environment: The G-cubed Model" *Handbook of CGE Modeling*, Chapter 17, North Holland, forthcoming

Gilbert E. Metcalf. "Green Employment Tax Swap: Using a Carbon Tax to Finance Payroll Tax Relief," *A Brookings Institution -World Resources Institute Tax Reform, Energy and the Environment Policy Brief* (2007a).

Gilbert E. Metcalf. "Corporate Tax Reform: Paying the Bills with a Carbon Tax," *Public Finance Review*, Vol. 35, No. 3, pp. 440-459, (2007b)

Morris, A., "Equity and Efficiency in Cap-and-Trade: Effectively Managing the Emissions Allowance Supply," The Brookings Institution, October 2009. http://www.brookings.edu/~/media/Files/rc/papers/2009/10_cap_and_trade_emissions_allowance_morris/10_cap_and_trade_emissions_allowance_morris.pdf

Parry, Ian, 1997. "Reducing Carbon Emissions: Interactions with the Tax System Raise the Cost," *Resources*, Resources for the Future, Summer 1997.

Parry, I.W.H., R.C. Williams III, and L.H. Goulder. 1999. When Can Carbon Abatement Policies Increase Welfare? The Fundamental Role of Distorted Factor Markets. *Journal of Environmental Economics and Management* 37(1): 51–84.

Parry, I., H. Sigman, M. Walls, and R. Williams. 2007. The Incidence of Pollution Control Policies. In T. Tietenberg and H. Folmer (eds.), *International Yearbook of Environmental and Resource Economics 2006/2007.* Northampton, MA: Edward Elgar.

Parry, I., and A.M. Bento. 2000. "Tax Deductions, Environmental Policy, and the 'Double Dividend' Hypothesis," *Journal of Environmental Economics and Management*, vol. 39, no. 1, pp. 67-95.

Parry, I., and W.E. Oates. 2000. Policy Analysis in the Presence of Distorting Taxes. *Journal of Policy Analysis and Management* 19:603-614.

Parry, I. and R. Williams, "Moving U.S. Climate Policy Forward: Are Carbon Taxes the Only Good Alternative?" Resources for the Future Discussion Paper RFF DP 11-02, February 2011.

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From: Metcalf, Gilbert
To: Brainard, Lael; Jaffe, Judson
Subject: RE: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress
Date: Tuesday, July 31, 2012 4:14:00 PM

Will do

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From: Brainard, Lael
Sent: Tuesday, July 31, 2012 3:18 PM
To: Metcalf, Gilbert; Jaffe, Judson
Subject: FW: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

(b)(5) [redacted]

From: Anderson, Charlie
Sent: Tuesday, July 31, 2012 2:19 PM
To: _DL_FYI
Subject: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

July 31st, 2012
10:18 AM ET

The danger of the do-nothing Congress

Editor's note: GPS sits down with Kenneth Rogoff, Thomas D. Cabot Professor of Public Policy and Professor of Economics at Harvard University, to discuss U.S. political gridlock and the cyber threat to the U.S. economy.

The 112th Congress has been dismissed by many as the ultimate do-nothing Congress. How much is the gridlock in Washington hurting the U.S. economic recovery?

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Of course, the Congress has been gridlocked for some time. This gridlock didn't matter so much during the credit bubble; the economy was growing briskly despite – or perhaps because of – limited government intervention or innovation. But we've reached a point where there's been so little reform for so long that it's a hindrance to growth. And, in the near term, things only seem to be getting worse, with ugly partisanship clearing out the center in both major parties.

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Unfortunately, we are sometimes too reluctant to regulate fast growing industries for fear of throwing out the baby with the bathwater. This is perhaps the right approach for nascent industries but becomes dangerous once they achieve critical mass any collapse is effectively systemic.

Of course, there are multiple federal task forces working on this, but at the same time, my strong impression is that we are barely at the stage of acknowledging the depth of the problem, much less undertaking effective solutions. One approach involves redundancies in the system to better protect them against this problem, but of course that involves investments and potentially higher costs for consumers. Such expenses might seem difficult to justify in a sustained downturn such as we are now experiencing, but these investments cannot be deferred.

A few years back, you wrote a book titled *This Time it's Different: Eight Centuries of Financial Folly*. Have we learned anything this time around?

The first thing to say is that the latest financial crisis has been remarkably similar to past, deep post-war financial crises that Carmen Reinhart and I studied in our 2009 book. Of course, this time, it has been concentrated in advanced countries to a degree that that hasn't been seen since the Great Depression.

One key lesson from past crises is that because the aftermath of a financial crisis is so long and so painful, it's important to resist the temptation to seek out quick fixes. Policy needs to keep focused on long-run

fundamentals.

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(b) (5) [redacted]

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U.S. Department of the Treasury
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(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Jaffe, Judson
Sent: Tuesday, July 31, 2012 3:35 PM
To: Metcalf, Gilbert
Subject: RE: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

(b) (5) [redacted]

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Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

From: Brainard, Lael
Sent: Tuesday, July 31, 2012 3:18 PM
To: Metcalf, Gilbert; Jaffe, Judson
Subject: FW: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

(b) (5) [redacted]

From: Anderson, Charlie
Sent: Tuesday, July 31, 2012 2:19 PM
To: _DL_FYI
Subject: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

July 31st, 2012
10:18 AM ET

The danger of the do-nothing Congress

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From:	Tonkonogy, Bella
To:	Jaffe, Judson; Berg, Katie; Lien, Elizabeth; Tsibulevskiy, EdwardDisabled; Hall, Daniel
Cc:	Demopulos, Abigail; Urbanas, Elizabeth (Beth)Disabled; Metcalf, GilbertDisabled
Subject:	G20 Study Group on Climate Finance- your assistance requested
Date:	Friday, September 07, 2012 11:48:55 AM
Attachments:	CFSG Questionnaire FINAL.docx CFSG TOR FINAL.docx

Hi everyone-

The G20 study group on climate finance has agreed on a work plan for the fall to continue discussions on "ways to effectively mobilize" climate finance (see attached TOR). As part of this work plan, the members of the group agreed to answer a questionnaire (also attached) prior to a face to face meeting being held September 23 in Mexico. Both the questionnaire and meeting are to feed into a progress report to be submitted to Ministers in November.

We now have to answer this questionnaire. I would appreciate your help in developing a draft as it covers a wide variety of material. (b) (5)

Issue 1: Potential of sources identified and other sources to consider (b) (5)
Issue 2: Carbon Pricing Instruments (b) (5)
Issue 3: Charges to mitigate emissions in international aviation and maritime transportation (b) (5)
Issue 4: Fossil Fuel Subsidy Reforms (b) (5)
Issue 5: Carbon Markets (b) (5)
Issue 6: Direct Budget Transfers and Instruments to engage private finance (b) (5)
Issue 7: MDB Resources (b) (5)

Let's aim to have responses drafted **by next Wednesday (September 12) noon**, so we have time for a full internal and interagency review before responses are due (September 19).

Thanks so much!
Bella

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G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

INTRODUCTION

The study group will report to G20 Finance Ministers on the state of discussion among members on ways to effectively mobilize resources for Climate Finance.

Among other analysis on which the work of the group can build upon are two reports already presented to G20 Finance Ministers but not yet discussed in significant detail. These are: *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers* (IFI Report to the G20) in 2011; and the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing* (AGF Report) in 2010. The AGF report provided an overview of a number of potential sources and the IFI report to the G20 elaborated on these providing additional details on the economic and financial rationale of the potential sources, their incidence and some issues to be dealt with for implementation.

The purpose of this Questionnaire is to initiate the work of the study group, by fostering an exchange views on options outlined in the aforementioned reports, as well as other options or potential issues not yet explored. The Questionnaire provides a tentative framework to organize the discussion, while leaving G20 members participating to the study group with all freedom to express their views on these and any other subject they judge adequate in the frame of the group and providing any additional appropriate information to feed the discussion.

QUESTIONS

ISSUE 1: Potential of sources identified and other sources to consider

Developed countries have committed, *"in the context of meaningful mitigation actions and transparency on implementation, to a goal of jointly mobilizing US$100bn per year by 2020 to address the needs of developing countries*". This funding will come from a variety of sources.

- *Do you consider that the variety of potential sources tackled by the IFI Report to the G20 could in principle bring sufficient revenues and predictable enough flows of finance to the fight against climate change and to reach in particular the goal of mobilizing $100bn a year?*
- *What other additional sources should the G20 also consider? For each of these sources, what measures would be required to mobilize them and what are the impediments, consequences and advantages of these measures? What could be the role of the G20 to move forward in this respect?*

ISSUE 2: Carbon Pricing Instruments

Carbon pricing policies through taxes or emission trading schemes have been pilot-tested however not universally adopted for a number of reasons.

- *For countries that have not implemented carbon pricing policies, what are the major impediments for introducing such a policy and what can be done to overcome them?*
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- *What are the comparative advantages of specific sector carbon tax proposals and broader tax on domestic sources?*
- *To what extent could expected revenues be directed to international climate finance?*
- *What could be in your view the role of the G20, if any, in terms of a shared approach to carbon pricing policies?*

ISSUE 3: Charges to mitigate emissions in international aviation and maritime transportation

The IFI Report to the G20 considers that this modality may have very significant financing and mitigation potential.

- *What could be the difficulties and adverse consequences to the implementation of such measures and what would be the ways to overcome them? In particular, could adequate compensation mechanisms be designed to prevent negative impacts on developing countries?*
- *Should such measures be implemented, to what extent could expected revenues be directed to international climate finance? What should be in this case the potential role of national tax agencies/authorities in the collection and disbursement of the bunkers revenues?*
- *What could be in your view the role of the G20 in advancing the common understanding around such instruments, in relation with other appropriate fora?*

ISSUE 4: Fossil fuel subsidy reforms

G20 members have committed to "*rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption over the medium term while providing targeted support to the poorest*"[1]. Tracking progress towards this objective is work undertaken within the G20 Energy Working Group.

- *To what extent could revenues saved by country governments in phasing out such subsidies be directed to climate finance?*

[1] Paragraph XXX

ISSUE 5: Carbon Markets

While the global institutional context is currently subject to uncertainties, carbon markets, including offsetting mechanisms such as the Clean Development Mechanism (CDM) are promising instruments.

- *Are carbon markets, including offsetting mechanisms, a promising way to mobilize private flows? What could be done to deal with the challenges and short term concerns such as the volatility and low price of carbon credits and what could be learnt from countries that have dealt with these challenges?*
- *What could the G20 expect from the UNFCCC and other fora to enhance this instrument and what could be its own role?*

ISSUE 6: Direct Budget Transfers and instruments to engage Private Finance

Direct budget transfers play a key role in the mobilization of climate finance, responding to needs which private flows may address only imperfectly. Nevertheless, the dominant scale of global private capital markets suggest that the private sector will need to play a central role in the mobilization of climate finance in the long run. Public policy and finance play a crucial dual role by establishing the incentive frameworks needed to catalyze high levels of investment in mitigation and adaptation activities including by generating public resources that can be targeted at market failures and other barriers to private finance.

- *What are the crucial elements of an incentive framework needed to catalyze high levels of climate-related investments, including from private finance??*
- *What role could direct budget contributions play in that regard?*
- *How should countries that have made commitments to additional public financing cooperate to leverage most effectively private sector investment?*
- *What measures could be taken to ensure that private finance also address adaptation projects and also take into account country ownership and national development priorities of developing countries?*

ISSUE 7: MDB resources

The *MDBs* also play a key role in leveraging financing flows, by using instruments such as loans, guarantees, grants or equity.

- *What role could MDB resources play with respect to climate finance?*
- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*

G20 STUDY GROUP ON CLIMATE FINANCE
TERMS OF REFERENCE

5 September 2012

MANDATE (see also Annexure)

- *13. We will continue to work on climate finance with the establishment of a G20 study group to consider ways to effectively mobilize resources and support the operationalization process of the Green Climate Fund taking into account the objectives, provisions and principles of the UNFCCC. [**G20 Finance Ministers and Central Bank Governors, Washington DC, April 2012**]*

- *71. … We welcome the creation of the G20 study group on climate finance, in order to consider ways to effectively mobilize resources taking into account the objectives, provisions and principles of the UNFCCC in line with the Cancun Agreement and ask to provide a progress report to Finance Ministers in November". [**G20 Leaders Declaration, Los Cabos, June 2012**]*

PURPOSE

G20 Heads of State have identified the need for stronger engagement and cooperation to fight climate change in several declarations since 2009 (see Annexure). In light of the above statements, the purpose of the study group created this year is to seek to build stronger consensus among the G20 members on ways to effectively mobilize resources in support of the broader multilateral processes underway, including to contribute to the work of the UNFCCC.

FOCUS

At their meeting in 2012, the Leaders reiterated their 2011 mandate for G20 Finance Ministers: *to consider ways to effectively mobilize resource*s. The work of the study group is strictly framed by this mandate.

G20 Finance Ministers have been presented, but not endorsed, two reports on the question of Climate Finance at their previous meetings: the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing (AGF Report)* in November 2010 and *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers*, coordinated by the World Bank and the IMF, in October 2011.

The study group provides an opportunity to discuss among others the content of these analyses and advance consideration of climate finance sources.

PARTICIPATION

The discussion of options will take place amongst the G20 members participating in the study group. In undertaking their work, the group may request the technical support provided by IOs or other entities, as needed; yet the G20 members of the group will be solely responsible for submitting any agreed deliverable to the Finance Ministers.

WORK OF THE STUDY GROUP

Taking into account the short timeframe on which to deliver on this instruction from Leaders, the study group will pursue the following activities:

1. Review lessons learned on how to effectively mobilize climate finance from experiences to date (notably based on reporting from UNFCCC, as well as information provided by G20 members, IFIs and other relevant fora).
2. Review the options for effectively mobilizing resources outlined in the reports presented to G20 Finance Ministers, as well as other potential options, and receive any additional analysis from G20 members;
3. Exchange views on these options, taking into account all potential impacts, and their implications taking into account the objectives, provisions and principles of UNFCCC.

DELIVERABLES

The study group will provide a progress report to the G20 Finance Ministers on the possible ways to effectively mobilize resources for Climate Finance. This may include an assessment of where specific technical and other analysis may be helpful in supporting the effort to build a common understanding within the G20 membership.

TENTATIVE WORK PROGRAM & CALENDAR

August	Agreement on the TOR Agreement on the questionnaire Agreement on a date and venue for the face to face meeting required to draft the report
September	Country returns of questionnaires Face to face meeting towards an agreed draft report on the progress of the study group, based on country responses to the questionnaires (Sept. 23, Mexico City)
October	Agreement on the progress report
November	Submission of the progress report to Ministers

ANNEXURE

2009: *'33. we welcome the work of the Finance Ministers* ***and direct them to report back at their next meeting with a range of possible options for climate change financing*** *to be provided as a resource to be considered in the UNFCCC negotiations at Copenhagen'* (Pittsburgh)

2010: *'41. We reiterate our commitment to a green recovery and to sustainable global growth. Those of us who have associated with the Copenhagen Accord reaffirm our support for it and its implementation and call on others to associate with it. We are committed to engage in negotiations under the UNFCCC on the basis of its objective provisions and principles including common but differentiated responsibilities and respective capabilities and are determined to ensure a successful outcome through an inclusive process at the Cancun Conferences. ….* ***We look forward to the outcome of the UN Secretary-General's High-Level Advisory Group on Climate Change Financing which is, inter alia, exploring innovative financing.*** *42. We note with appreciation the report on energy subsidies from the International Energy Agency (IEA), Organization of the Petroleum Exporting Countries (OPEC), OECD and World Bank. We welcome the work of Finance and Energy Ministers in delivering implementation strategies and timeframes, based on national circumstances, for the rationalization and phase out over the medium term of inefficient fossil fuel subsidies that encourage wasteful consumption, taking into account vulnerable groups and their development needs. We also encourage continued and full implementation of country specific strategies and will continue to review progress towards this commitment at upcoming summits'* (Toronto)

2010: *'66. … In this regard we* ***welcome the work of the High-level Advisory Group on Climate Change Financing established by the UN Secretary General and ask our Finance Ministers to consider its report****. We also support and encourage the delivery of fast-start finance commitments'* (Seoul)

2011: *'63. Financing the fight against climate change is one of our main priorities. In Copenhagen, developed countries have committed to the goal of mobilizing jointly USD 100 billion per year from all sources by 2020 to assist developing countries to mitigate and adapt to the impact of climate change, in the context of meaningful mitigation actions and transparency.* ***We discussed the World Bank -- IMF -- OECD -- regional development banks report on climate finance and call for continued work taking into account the objectives, provisions and principles of the UNFCCC by international financial institutions and the relevant UN organizations****.* ***We ask our Finance Ministers to report to us at our next Summit on progress made on climate finance****; 64. We reaffirm that climate finance will come from a wide variety of sources, public and private, bilateral and multilateral, including innovative sources of finance. We recognize the role of public finance and public policy in supporting climate-related investments in developing countries. We underline the role of the private sector in supporting climate-related investments globally, particularly through various market-based mechanisms and also call on the MDBs to develop new and innovative financial instruments to increase their leveraging effect on private flows*. (Cannes)

From:	Tonkonogy, Bella
To:	"Brown, Jessica S"; "BodnarP@state.gov"
Cc:	Lien, Elizabeth
Subject:	G20 Study Group on Climate Finance
Date:	Friday, September 07, 2012 3:54:17 PM
Attachments:	CFSG Questionnaire FINAL.docx CFSG TOR FINAL.docx

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Hi there-

Just a heads up that the G20 Study Group on Climate Finance agreed a TOR and questionnaire (attached). We are tasked with completing the questionnaire by Sept 19- therefore, look for draft responses for review mid-late next week. The face to face meeting will be held September 23 in Mexico City; Gib and I will attend.

Best,
Bella

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- *To what extent could revenues saved by country governments in phasing out such subsidies be directed to climate finance?*

[1] Paragraph XXX

ISSUE 5: Carbon Markets

While the global institutional context is currently subject to uncertainties, carbon markets, including offsetting mechanisms such as the Clean Development Mechanism (CDM) are promising instruments.

- *Are carbon markets, including offsetting mechanisms, a promising way to mobilize private flows? What could be done to deal with the challenges and short term concerns such as the volatility and low price of carbon credits and what could be learnt from countries that have dealt with these challenges?*
- *What could the G20 expect from the UNFCCC and other fora to enhance this instrument and what could be its own role?*

ISSUE 6: Direct Budget Transfers and instruments to engage Private Finance

Direct budget transfers play a key role in the mobilization of climate finance, responding to needs which private flows may address only imperfectly. Nevertheless, the dominant scale of global private capital markets suggest that the private sector will need to play a central role in the mobilization of climate finance in the long run. Public policy and finance play a crucial dual role by establishing the incentive frameworks needed to catalyze high levels of investment in mitigation and adaptation activities including by generating public resources that can be targeted at market failures and other barriers to private finance.

- *What are the crucial elements of an incentive framework needed to catalyze high levels of climate-related investments, including from private finance??*
- *What role could direct budget contributions play in that regard?*
- *How should countries that have made commitments to additional public financing cooperate to leverage most effectively private sector investment?*
- *What measures could be taken to ensure that private finance also address adaptation projects and also take into account country ownership and national development priorities of developing countries?*

ISSUE 7: MDB resources

The *MDBs* also play a key role in leveraging financing flows, by using instruments such as loans, guarantees, grants or equity.

- *What role could MDB resources play with respect to climate finance?*
- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*

G20 STUDY GROUP ON CLIMATE FINANCE
TERMS OF REFERENCE

5 September 2012

MANDATE (see also Annexure)

- *13. We will continue to work on climate finance with the establishment of a G20 study group to consider ways to effectively mobilize resources and support the operationalization process of the Green Climate Fund taking into account the objectives, provisions and principles of the UNFCCC. [**G20 Finance Ministers and Central Bank Governors, Washington DC, April 2012**]*

- *71. … We welcome the creation of the G20 study group on climate finance, in order to consider ways to effectively mobilize resources taking into account the objectives, provisions and principles of the UNFCCC in line with the Cancun Agreement and ask to provide a progress report to Finance Ministers in November". [**G20 Leaders Declaration, Los Cabos, June 2012**]*

PURPOSE

G20 Heads of State have identified the need for stronger engagement and cooperation to fight climate change in several declarations since 2009 (see Annexure). In light of the above statements, the purpose of the study group created this year is to seek to build stronger consensus among the G20 members on ways to effectively mobilize resources in support of the broader multilateral processes underway, including to contribute to the work of the UNFCCC.

FOCUS

At their meeting in 2012, the Leaders reiterated their 2011 mandate for G20 Finance Ministers: *to consider ways to effectively mobilize resource*s. The work of the study group is strictly framed by this mandate.

G20 Finance Ministers have been presented, but not endorsed, two reports on the question of Climate Finance at their previous meetings: the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing (AGF Report)* in November 2010 and *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers*, coordinated by the World Bank and the IMF, in October 2011.

The study group provides an opportunity to discuss among others the content of these analyses and advance consideration of climate finance sources.

PARTICIPATION

The discussion of options will take place amongst the G20 members participating in the study group. In undertaking their work, the group may request the technical support provided by IOs or other entities, as needed; yet the G20 members of the group will be solely responsible for submitting any agreed deliverable to the Finance Ministers.

WORK OF THE STUDY GROUP

Taking into account the short timeframe on which to deliver on this instruction from Leaders, the study group will pursue the following activities:

1. Review lessons learned on how to effectively mobilize climate finance from experiences to date (notably based on reporting from UNFCCC, as well as information provided by G20 members, IFIs and other relevant fora).
2. Review the options for effectively mobilizing resources outlined in the reports presented to G20 Finance Ministers, as well as other potential options, and receive any additional analysis from G20 members;
3. Exchange views on these options, taking into account all potential impacts, and their implications taking into account the objectives, provisions and principles of UNFCCC.

DELIVERABLES

The study group will provide a progress report to the G20 Finance Ministers on the possible ways to effectively mobilize resources for Climate Finance. This may include an assessment of where specific technical and other analysis may be helpful in supporting the effort to build a common understanding within the G20 membership.

TENTATIVE WORK PROGRAM & CALENDAR

August	Agreement on the TOR Agreement on the questionnaire Agreement on a date and venue for the face to face meeting required to draft the report
September	Country returns of questionnaires Face to face meeting towards an agreed draft report on the progress of the study group, based on country responses to the questionnaires (Sept. 23, Mexico City)
October	Agreement on the progress report
November	Submission of the progress report to Ministers

ANNEXURE

2009: *'33. we welcome the work of the Finance Ministers* ***and direct them to report back at their next meeting with a range of possible options for climate change financing*** *to be provided as a resource to be considered in the UNFCCC negotiations at Copenhagen'* (Pittsburgh)

2010: *'41. We reiterate our commitment to a green recovery and to sustainable global growth. Those of us who have associated with the Copenhagen Accord reaffirm our support for it and its implementation and call on others to associate with it. We are committed to engage in negotiations under the UNFCCC on the basis of its objective provisions and principles including common but differentiated responsibilities and respective capabilities and are determined to ensure a successful outcome through an inclusive process at the Cancun Conferences. ….* ***We look forward to the outcome of the UN Secretary-General's High-Level Advisory Group on Climate Change Financing which is, inter alia, exploring innovative financing.*** *42. We note with appreciation the report on energy subsidies from the International Energy Agency (IEA), Organization of the Petroleum Exporting Countries (OPEC), OECD and World Bank. We welcome the work of Finance and Energy Ministers in delivering implementation strategies and timeframes, based on national circumstances, for the rationalization and phase out over the medium term of inefficient fossil fuel subsidies that encourage wasteful consumption, taking into account vulnerable groups and their development needs. We also encourage continued and full implementation of country specific strategies and will continue to review progress towards this commitment at upcoming summits'* (Toronto)

2010: *'66. … In this regard we* ***welcome the work of the High-level Advisory Group on Climate Change Financing established by the UN Secretary General and ask our Finance Ministers to consider its report****. We also support and encourage the delivery of fast-start finance commitments'* (Seoul)

2011: *'63. Financing the fight against climate change is one of our main priorities. In Copenhagen, developed countries have committed to the goal of mobilizing jointly USD 100 billion per year from all sources by 2020 to assist developing countries to mitigate and adapt to the impact of climate change, in the context of meaningful mitigation actions and transparency.* ***We discussed the World Bank -- IMF -- OECD -- regional development banks report on climate finance and call for continued work taking into account the objectives, provisions and principles of the UNFCCC by international financial institutions and the relevant UN organizations****.* ***We ask our Finance Ministers to report to us at our next Summit on progress made on climate finance****; 64. We reaffirm that climate finance will come from a wide variety of sources, public and private, bilateral and multilateral, including innovative sources of finance. We recognize the role of public finance and public policy in supporting climate-related investments in developing countries. We underline the role of the private sector in supporting climate-related investments globally, particularly through various market-based mechanisms and also call on the MDBs to develop new and innovative financial instruments to increase their leveraging effect on private flows*. (Cannes)

From:	Jaffe, Judson
To:	Tonkonogy, Bella; Hall, Daniel; Metcalf, GilbertDisabled; Urbanas, Elizabeth (Beth)Disabled; Demopulos, Abigail
Subject:	G20 Questionnaire: Proposed Answer to Issue 2
Date:	Tuesday, September 11, 2012 9:59:00 AM
Attachments:	G20 Question 2 response v2.doc

I've attached my first cut at answering issue 2 of this questionnaire. (b) (5)

Finally, Daniel, can you confirm that you'll handle Issue 3? Let me know if you need any help with it.

Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

From: Tonkonogy, Bella
Sent: Friday, September 07, 2012 11:49 AM
To: Jaffe, Judson; Berg, Katie; Lien, Elizabeth; Tsibulevskiy, Edward; Hall, Daniel
Cc: Demopulos, Abigail; Urbanas, Elizabeth (Beth); Metcalf, Gilbert
Subject: G20 Study Group on Climate Finance- your assistance requested

Hi everyone-

The G20 study group on climate finance has agreed on a work plan for the fall to continue discussions on "ways to effectively mobilize" climate finance (see attached TOR). As part of this work plan, the members of the group agreed to answer a questionnaire (also attached) prior to a face to face meeting being held September 23 in Mexico. Both the questionnaire and meeting are to feed into a progress report to be submitted to Ministers in November.

We now have to answer this questionnaire. I would appreciate your help in developing a draft as it covers a wide variety of material. (b) (5)

(b) (5) [redacted]

Issue 1: Potential of sources identified and other sources to consider (b) (5) [redacted]
Issue 2: Carbon Pricing Instruments (b) (5) [redacted]
Issue 3: Charges to mitigate emissions in international aviation and maritime transportation (b) (5) [redacted]
Issue 4: Fossil Fuel Subsidy Reforms (b) (5) [redacted]
Issue 5: Carbon Markets (b) (5) [redacted]
Issue 6: Direct Budget Transfers and Instruments to engage private finance (b) (5) [redacted]
Issue 7: MDB Resources (b) (5) [redacted]

Let's aim to have responses drafted **by next Wednesday (September 12) noon**, so we have time for a full internal and interagency review before responses are due (September 19).

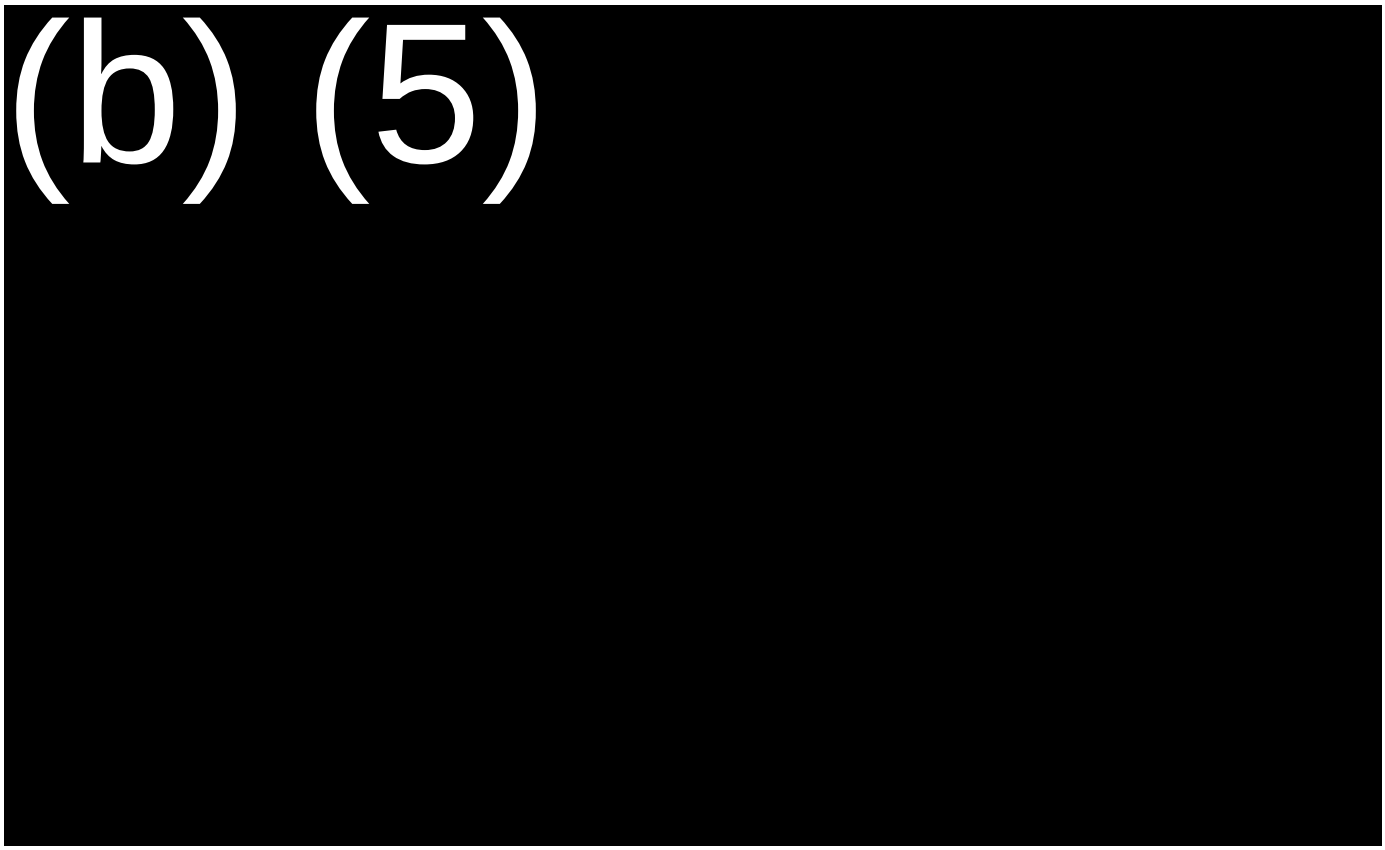
Thanks so much!
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

ISSUE 2: Carbon Pricing Instruments

Carbon pricing policies through taxes or emission trading schemes have been pilot-tested however not universally adopted for a number of reasons.

- For countries that have not implemented carbon pricing policies, what are the major impediments for introducing such a policy and what can be done to overcome them?
- For countries with carbon pricing policies, would you consider it desirable to extend domestic carbon pricing policies (taxes or emission trading schemes) to more sectors in your own country and/or to more countries? What would be the impediments to doing this?
- What adverse outcomes can be foreseen and how could they be dealt with?
- What are the comparative advantages of specific sector carbon tax proposals and broader tax on domestic sources?
- To what extent could expected revenues be directed to international climate finance?
- What could be in your view the role of the G20, if any, in terms of a shared approach to carbon pricing policies?


(b) (5)

From:	Tonkonogy, Bella
To:	Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Berg, Katie
Cc:	Urbanas, Elizabeth (Beth)Disabled; Demopulos, Abigail
Subject:	RE: G20 Questionnaire: Proposed Answer to Issue 2
Date:	Friday, September 14, 2012 3:53:39 PM
Attachments:	CFSG Questionnaire FINAL_US.docx

I've put all the G20 responses into one doc and am planning to send out for interagency by the end of the day. Please send me names of anyone who needs to review ASAP.

(b) (5) [redacted]

Thanks, all!

From: Jaffe, Judson
Sent: Tuesday, September 11, 2012 10:00 AM
To: Tonkonogy, Bella; Hall, Daniel; Metcalf, Gilbert; Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: G20 Questionnaire: Proposed Answer to Issue 2

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G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

INTRODUCTION

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Among other analysis on which the work of the group can build upon are two reports already presented to G20 Finance Ministers but not yet discussed in significant detail. These are: *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers* (IFI Report to the G20) in 2011; and the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing* (AGF Report) in 2010. The AGF report provided an overview of a number of potential sources and the IFI report to the G20 elaborated on these providing additional details on the economic and financial rationale of the potential sources, their incidence and some issues to be dealt with for implementation.

The purpose of this Questionnaire is to initiate the work of the study group, by fostering an exchange views on options outlined in the aforementioned reports, as well as other options or potential issues not yet explored. The Questionnaire provides a tentative framework to organize the discussion, while leaving G20 members participating to the study group with all freedom to express their views on these and any other subject they judge adequate in the frame of the group and providing any additional appropriate information to feed the discussion.

QUESTIONS

ISSUE 1: Potential of sources identified and other sources to consider

Developed countries have committed, *"in the context of meaningful mitigation actions and transparency on implementation, to a goal of jointly mobilizing US$100bn per year by 2020 to address the needs of developing countries*". This funding will come from a variety of sources.

- *Do you consider that the variety of potential sources tackled by the IFI Report to the G20 could in principle bring sufficient revenues and predictable enough flows of finance to the fight against climate change and to reach in particular the goal of mobilizing $100bn a year?*
- *What other additional sources should the G20 also consider? For each of these sources, what measures would be required to mobilize them and what are the impediments, consequences and advantages of these measures? What could be the role of the G20 to move forward in this respect?*

(b) (5)

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(b) (5)

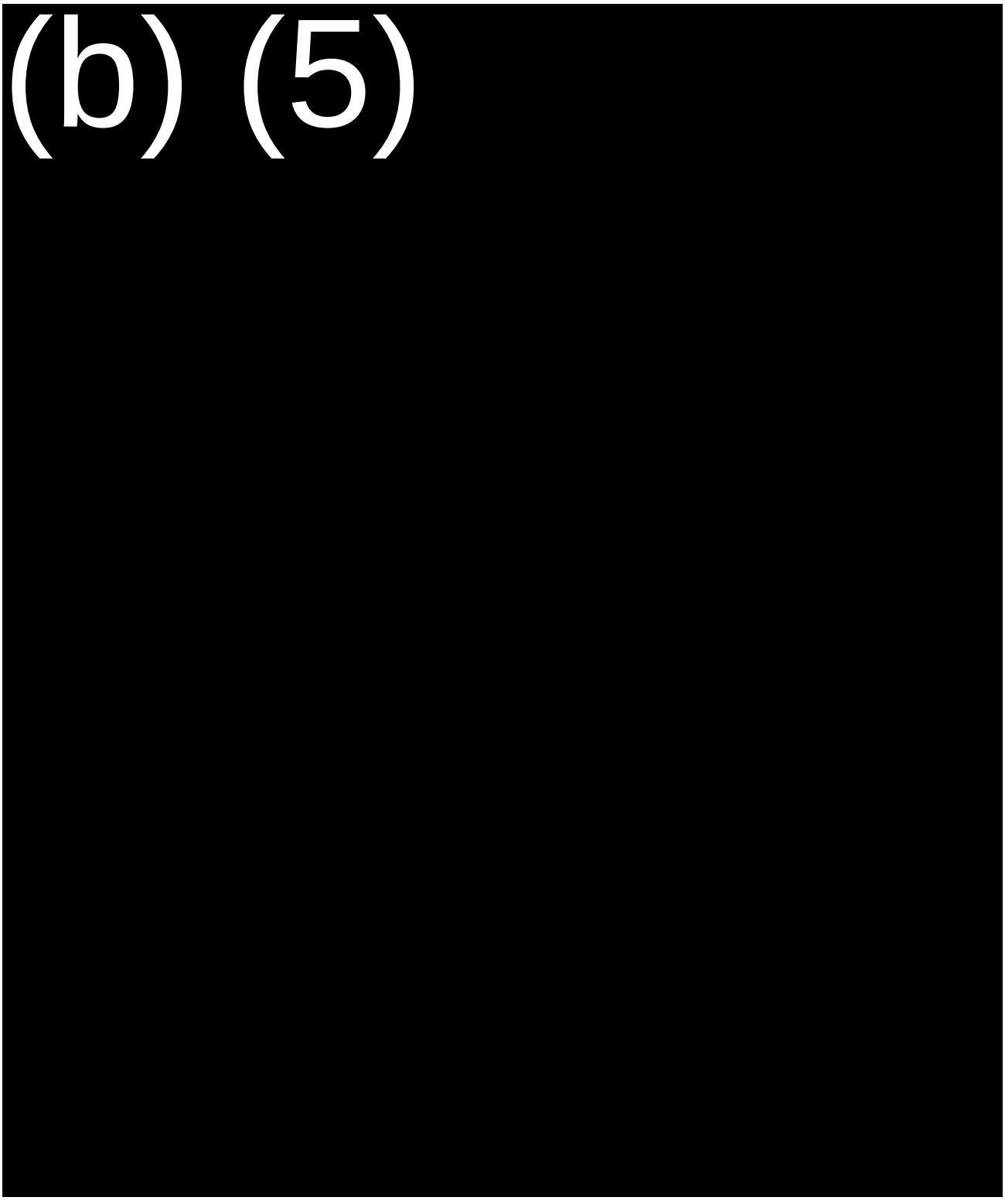
ISSUE 3: Charges to mitigate emissions in international aviation and maritime transportation

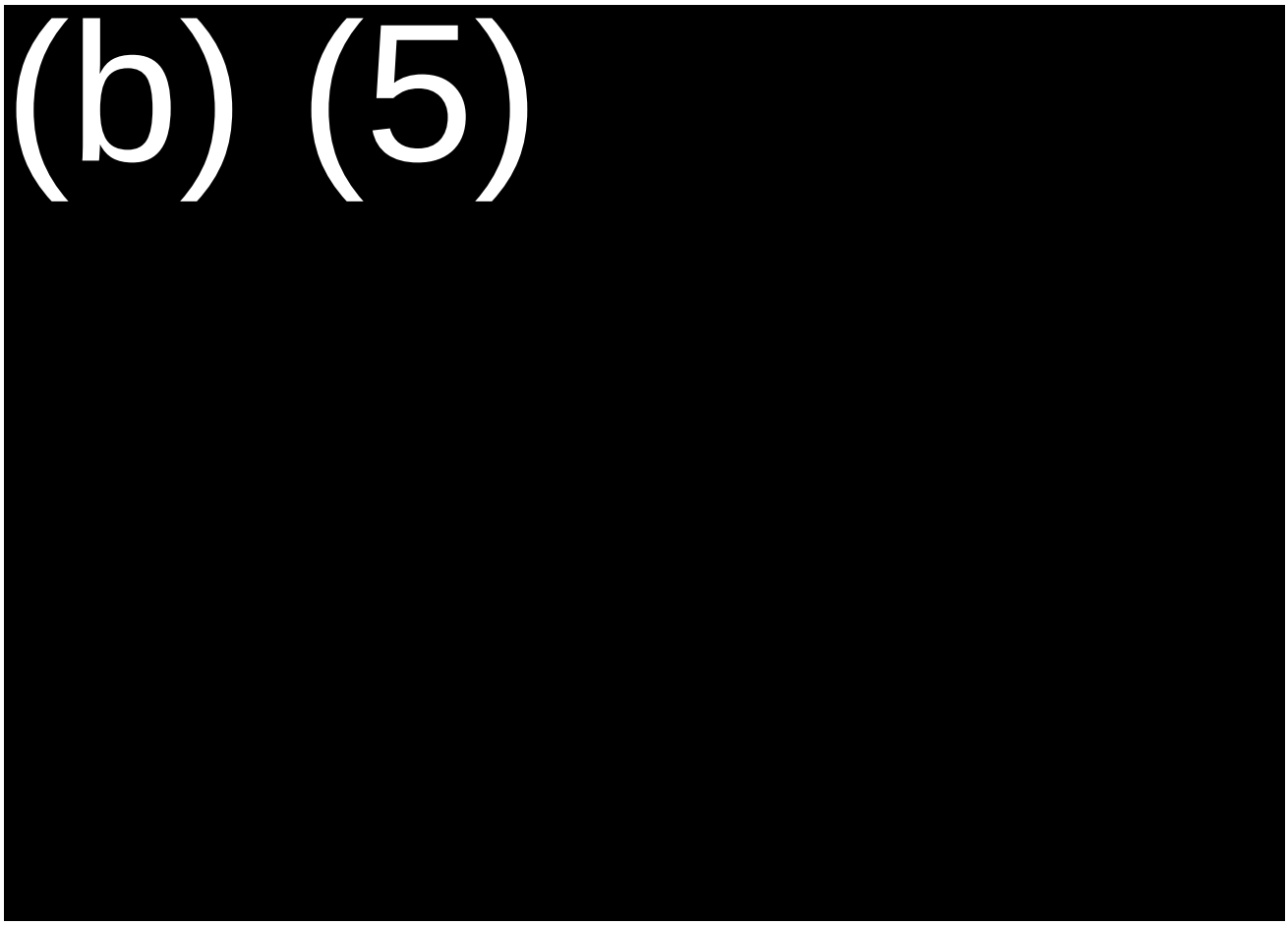
The IFI Report to the G20 considers that this modality may have very significant financing and mitigation potential.

- *What could be the difficulties and adverse consequences to the implementation of such measures and what would be the ways to overcome them? In particular, could*

adequate compensation mechanisms be designed to prevent negative impacts on developing countries?

- *Should such measures be implemented, to what extent could expected revenues be directed to international climate finance? What should be in this case the potential role of national tax agencies/authorities in the collection and disbursement of the bunkers revenues?*
- *What could be in your view the role of the G20 in advancing the common understanding around such instruments, in relation with other appropriate fora?*





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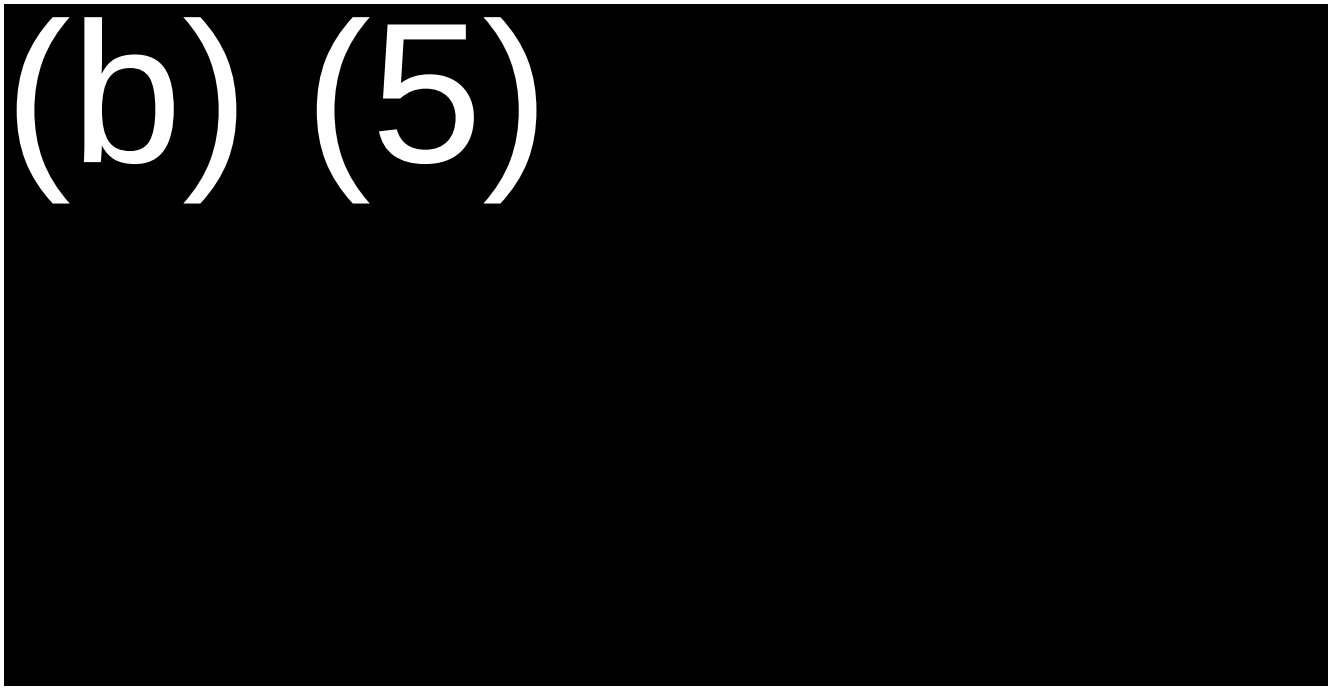

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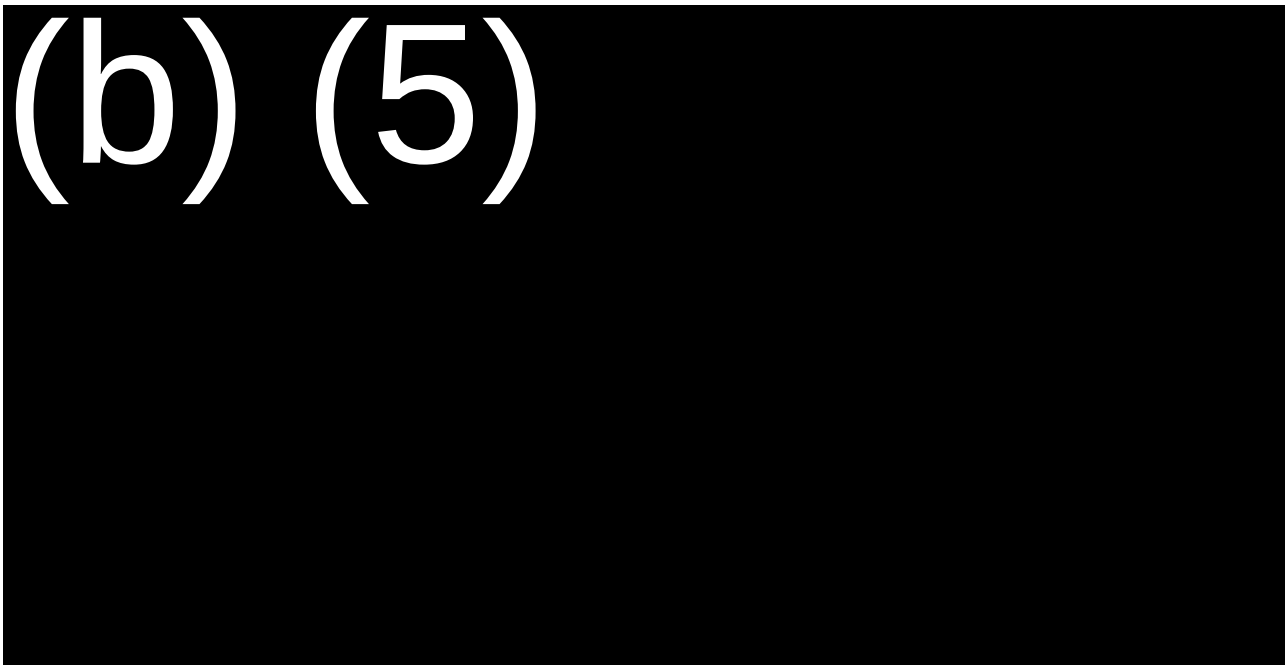
(b) (5)

From:	Tonkonogy, Bella
To:	Tonkonogy, Bella; Demopulos, Abigail; Dennis, Benjamin; Carlson, Curtis; "Carnahan, Kimberly C"; "Maurice LeFranc"; "Kelly, Alexia C"; "Bodnar, Paul"; "Brown, Jessica S"; "carl.burleson@faa.gov"; Heil, Mark; Soares, Chris; "Muehling.Brian@epamail.epa.gov"; "Wayne.M.Lundy@uscg.mil"
Cc:	Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)Disabled
Subject:	RE: G20 climate finance questionnaire- responses for interagency review
Date:	Tuesday, September 18, 2012 12:01:17 PM
Attachments:	CFSG Questionnaire FINAL_US.DOCX CFSG TOR FINAL.DOCX

All-

A friendly reminder to please provide comments/clearance on this questionnaire today.

Thank you,
Bella

From: Tonkonogy, Bella
Sent: Friday, September 14, 2012 4:48 PM
To: Demopulos, Abigail; Dennis, Benjamin; Carlson, Curtis; 'Carnahan, Kimberly C'; 'Maurice LeFranc'; 'Kelly, Alexia C'; 'Bodnar, Paul'; 'Brown, Jessica S'; 'carl.burleson@faa.gov'; Heil, Mark; Soares, Chris; 'Muehling.Brian@epamail.epa.gov'; 'Wayne.M.Lundy@uscg.mil'
Cc: Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)
Subject: G20 climate finance questionnaire- responses for interagency review

Dear Colleagues-

Please find attached draft questionnaire responses for the G20 Study Group on Climate Finance for your comment and clearance by **noon on Tuesday, September 18.**

The Issues covered in the questionnaire are the following:
Issue 1: Potential of sources identified and other sources to consider
Issue 2: Carbon Pricing Instruments
Issue 3: Charges to mitigate emissions in international aviation and maritime transportation
Issue 4: Fossil Fuel Subsidy Reforms
Issue 5: Carbon Markets
Issue 6: Direct Budget Transfers and Instruments to engage private finance
Issue 7: MDB Resources

Background:
At the G20 Los Cabos Summit in June, Leaders welcomed the creation of a G20 Study Group on Climate Finance, "in order to consider ways to effectively mobilize resources." In response to this mandate, co-chairs France and South Africa, with support from Mexico, have developed a questionnaire for study group members (all G20 countries) to complete on mobilizing climate finance. This questionnaire is a follow on from a report prepared last year for the G20 by the World Bank, OECD, and the Regional Development Banks on "Mobilizing Climate Finance." The sources of finance described in that report include, among others, carbon markets, bunker fuel levies, private sector, etc.

Ultimately, the questionnaire responses and a face to face meeting on September 23 in Mexico will feed into a progress report to be presented by the study group to Ministers in November. The attached TOR provides more details on the mandate of this group and its tasks if you would like more background.

The responses are due to the Co-chairs on September 19 so thank you in advance for your quick turnaround.

Please let me know if you have questions.

Best regards,
Bella

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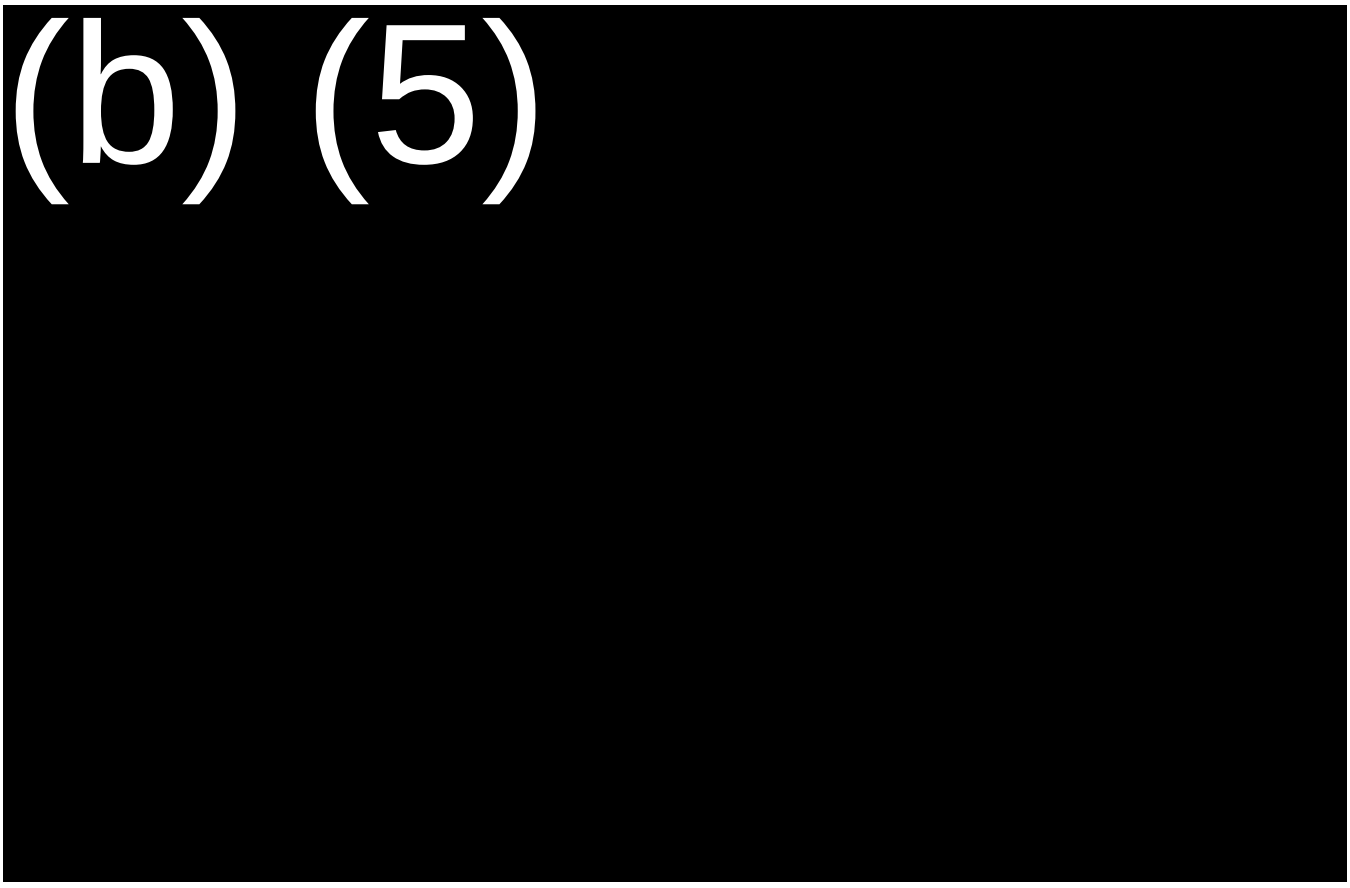

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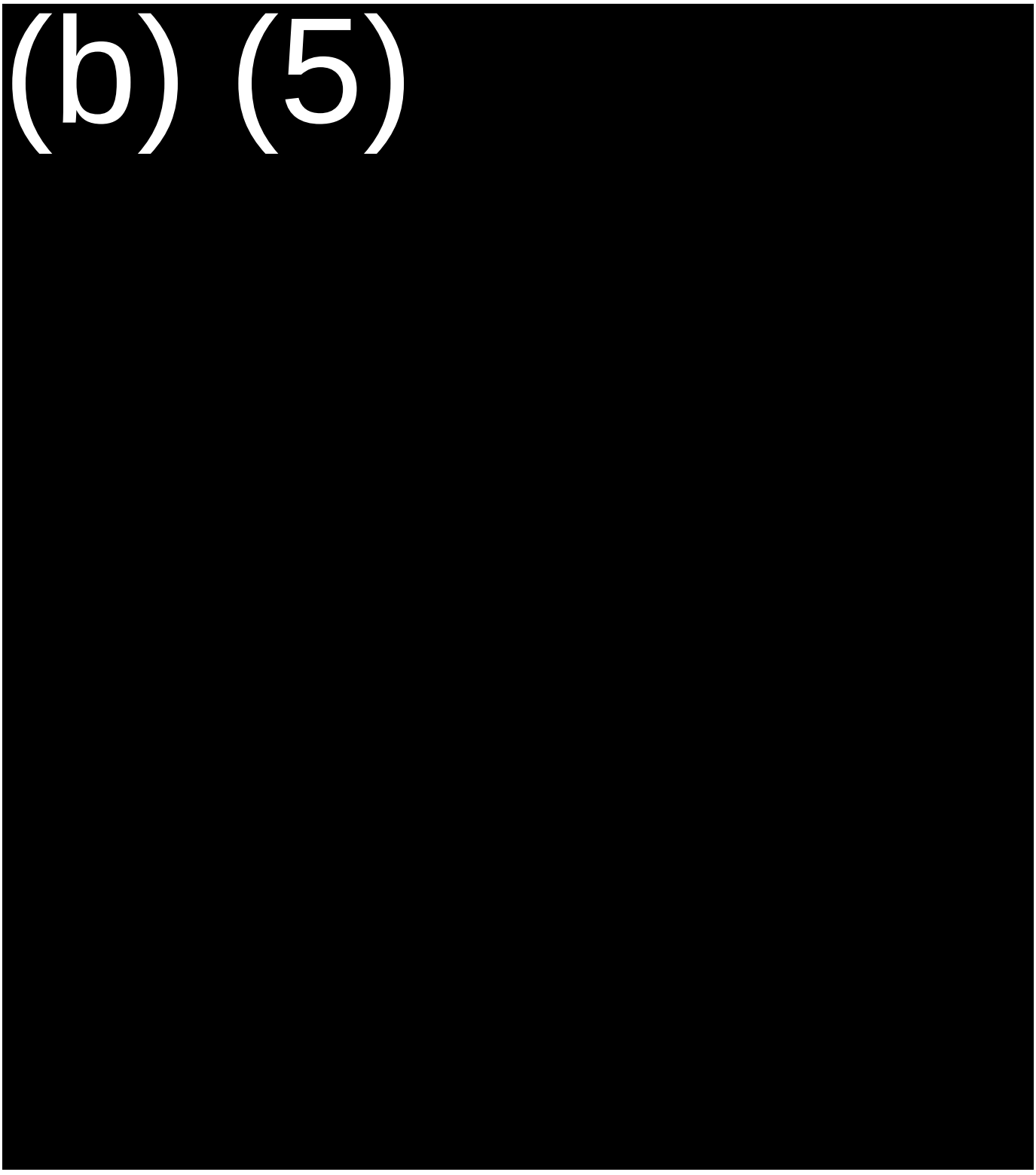

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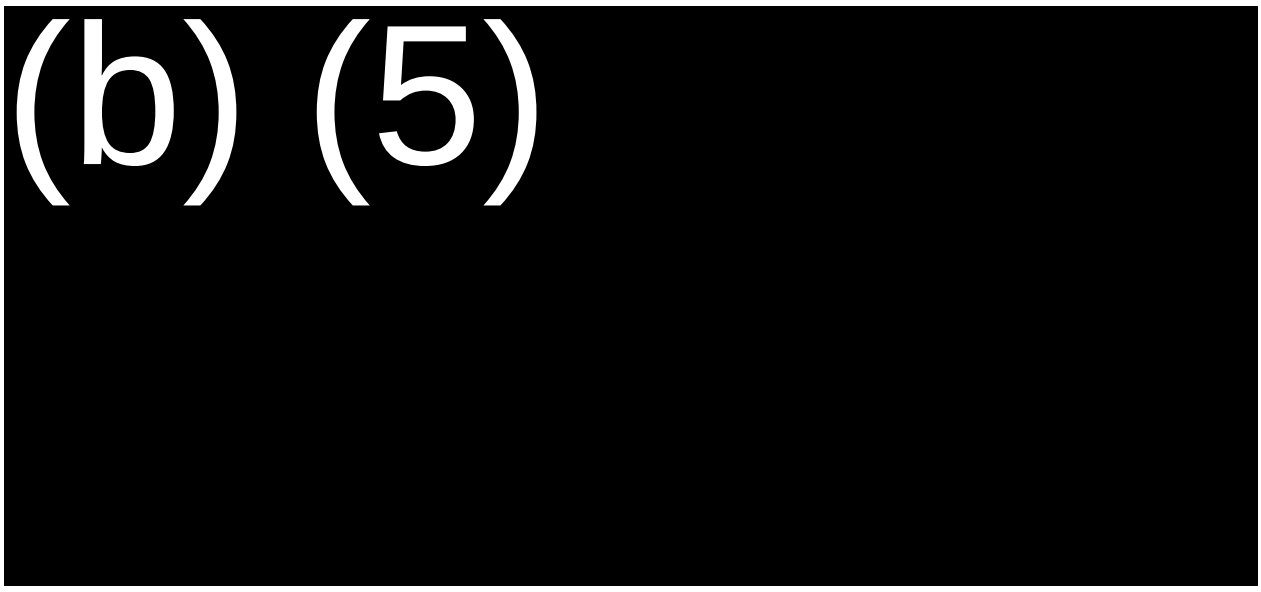
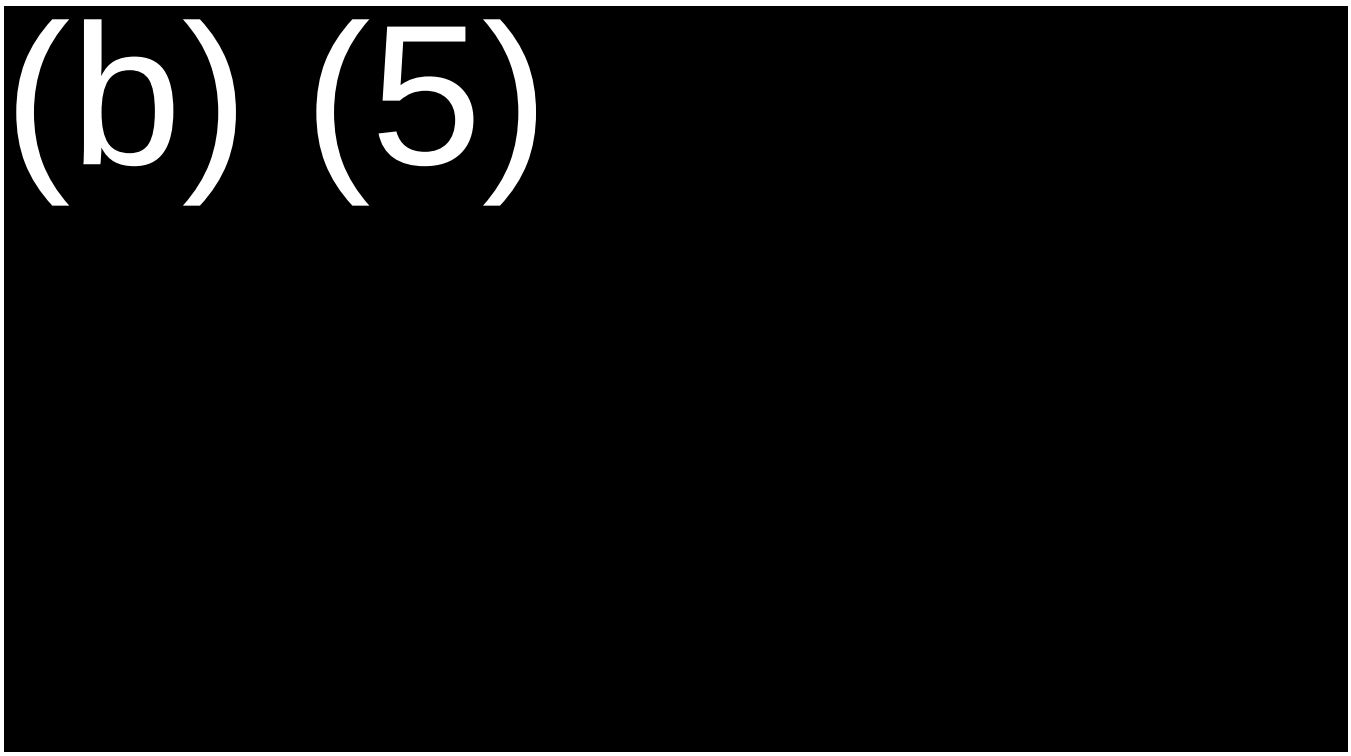


ISSUE 5: Carbon Markets

While the global institutional context is currently subject to uncertainties, carbon markets, including offsetting mechanisms such as the Clean Development Mechanism (CDM) are promising instruments.

- *Are carbon markets, including offsetting mechanisms, a promising way to mobilize private flows? What could be done to deal with the challenges and short term concerns such as the volatility and low price of carbon credits and what could be learnt from countries that have dealt with these challenges?*
- *What could the G20 expect from the UNFCCC and other fora to enhance this instrument and what could be its own role?*



ISSUE 6: Direct Budget Transfers and instruments to engage Private Finance

Direct budget transfers play a key role in the mobilization of climate finance, responding to needs which private flows may address only imperfectly. Nevertheless, the dominant scale of global private capital markets suggest that the private sector will need to play a central role in the mobilization of climate finance in the long run. Public policy and finance play a crucial dual role by establishing the incentive frameworks needed to catalyze high levels of investment in mitigation and adaptation activities including by generating public resources that can be targeted at market failures and other barriers to private finance.

- *What are the crucial elements of an incentive framework needed to catalyze high levels of climate-related investments, including from private finance??*
- *What role could direct budget contributions play in that regard?*
- *How should countries that have made commitments to additional public financing cooperate to leverage most effectively private sector investment?*
- *What measures could be taken to ensure that private finance also address adaptation projects and also take into account country ownership and national development priorities of developing countries?*

ISSUE 7: MDB resources

The *MDBs* also play a key role in leveraging financing flows, by using instruments such as loans, guarantees, grants or equity.

- *What role could MDB resources play with respect to climate finance?*

- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*

G20 STUDY GROUP ON CLIMATE FINANCE
TERMS OF REFERENCE

5 September 2012

MANDATE (see also Annexure)

- *13. We will continue to work on climate finance with the establishment of a G20 study group to consider ways to effectively mobilize resources and support the operationalization process of the Green Climate Fund taking into account the objectives, provisions and principles of the UNFCCC. [**G20 Finance Ministers and Central Bank Governors, Washington DC, April 2012**]*

- *71. … We welcome the creation of the G20 study group on climate finance, in order to consider ways to effectively mobilize resources taking into account the objectives, provisions and principles of the UNFCCC in line with the Cancun Agreement and ask to provide a progress report to Finance Ministers in November". [**G20 Leaders Declaration, Los Cabos, June 2012**]*

PURPOSE

G20 Heads of State have identified the need for stronger engagement and cooperation to fight climate change in several declarations since 2009 (see Annexure). In light of the above statements, the purpose of the study group created this year is to seek to build stronger consensus among the G20 members on ways to effectively mobilize resources in support of the broader multilateral processes underway, including to contribute to the work of the UNFCCC.

FOCUS

At their meeting in 2012, the Leaders reiterated their 2011 mandate for G20 Finance Ministers: *to consider ways to effectively mobilize resource*s. The work of the study group is strictly framed by this mandate.

G20 Finance Ministers have been presented, but not endorsed, two reports on the question of Climate Finance at their previous meetings: the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing (AGF Report)* in November 2010 and *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers*, coordinated by the World Bank and the IMF, in October 2011.

The study group provides an opportunity to discuss among others the content of these analyses and advance consideration of climate finance sources.

PARTICIPATION

The discussion of options will take place amongst the G20 members participating in the study group. In undertaking their work, the group may request the technical support provided by IOs or other entities, as needed; yet the G20 members of the group will be solely responsible for submitting any agreed deliverable to the Finance Ministers.

WORK OF THE STUDY GROUP

Taking into account the short timeframe on which to deliver on this instruction from Leaders, the study group will pursue the following activities:

1. Review lessons learned on how to effectively mobilize climate finance from experiences to date (notably based on reporting from UNFCCC, as well as information provided by G20 members, IFIs and other relevant fora).
2. Review the options for effectively mobilizing resources outlined in the reports presented to G20 Finance Ministers, as well as other potential options, and receive any additional analysis from G20 members;
3. Exchange views on these options, taking into account all potential impacts, and their implications taking into account the objectives, provisions and principles of UNFCCC.

DELIVERABLES

The study group will provide a progress report to the G20 Finance Ministers on the possible ways to effectively mobilize resources for Climate Finance. This may include an assessment of where specific technical and other analysis may be helpful in supporting the effort to build a common understanding within the G20 membership.

TENTATIVE WORK PROGRAM & CALENDAR

August	Agreement on the TOR Agreement on the questionnaire Agreement on a date and venue for the face to face meeting required to draft the report
September	Country returns of questionnaires Face to face meeting towards an agreed draft report on the progress of the study group, based on country responses to the questionnaires (Sept. 23, Mexico City)
October	Agreement on the progress report
November	Submission of the progress report to Ministers

ANNEXURE

2009: *'33. we welcome the work of the Finance Ministers* ***and direct them to report back at their next meeting with a range of possible options for climate change financing*** *to be provided as a resource to be considered in the UNFCCC negotiations at Copenhagen'* (Pittsburgh)

2010: *'41. We reiterate our commitment to a green recovery and to sustainable global growth. Those of us who have associated with the Copenhagen Accord reaffirm our support for it and its implementation and call on others to associate with it. We are committed to engage in negotiations under the UNFCCC on the basis of its objective provisions and principles including common but differentiated responsibilities and respective capabilities and are determined to ensure a successful outcome through an inclusive process at the Cancun Conferences. ….* ***We look forward to the outcome of the UN Secretary-General's High-Level Advisory Group on Climate Change Financing which is, inter alia, exploring innovative financing.*** *42. We note with appreciation the report on energy subsidies from the International Energy Agency (IEA), Organization of the Petroleum Exporting Countries (OPEC), OECD and World Bank. We welcome the work of Finance and Energy Ministers in delivering implementation strategies and timeframes, based on national circumstances, for the rationalization and phase out over the medium term of inefficient fossil fuel subsidies that encourage wasteful consumption, taking into account vulnerable groups and their development needs. We also encourage continued and full implementation of country specific strategies and will continue to review progress towards this commitment at upcoming summits'* (Toronto)

2010: *'66. … In this regard we* ***welcome the work of the High-level Advisory Group on Climate Change Financing established by the UN Secretary General and ask our Finance Ministers to consider its report****. We also support and encourage the delivery of fast-start finance commitments'* (Seoul)

2011: *'63. Financing the fight against climate change is one of our main priorities. In Copenhagen, developed countries have committed to the goal of mobilizing jointly USD 100 billion per year from all sources by 2020 to assist developing countries to mitigate and adapt to the impact of climate change, in the context of meaningful mitigation actions and transparency.* ***We discussed the World Bank -- IMF -- OECD -- regional development banks report on climate finance and call for continued work taking into account the objectives, provisions and principles of the UNFCCC by international financial institutions and the relevant UN organizations****.* ***We ask our Finance Ministers to report to us at our next Summit on progress made on climate finance****; 64. We reaffirm that climate finance will come from a wide variety of sources, public and private, bilateral and multilateral, including innovative sources of finance. We recognize the role of public finance and public policy in supporting climate-related investments in developing countries. We underline the role of the private sector in supporting climate-related investments globally, particularly through various market-based mechanisms and also call on the MDBs to develop new and innovative financial instruments to increase their leveraging effect on private flows*. (Cannes)

From: Jaffe, Judson
To: Tonkonogy, Bella
Subject: CFSG Questionnaire FINAL_US (2)
Date: Tuesday, September 18, 2012 12:37:00 PM
Attachments: CFSG Questionnaire FINAL_US (2).docx

Here are my comments/edits (including to my own submission…)

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

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The purpose of this Questionnaire is to initiate the work of the study group, by fostering an exchange views on options outlined in the aforementioned reports, as well as other options or potential issues not yet explored. The Questionnaire provides a tentative framework to organize the discussion, while leaving G20 members participating to the study group with all freedom to express their views on these and any other subject they judge adequate in the frame of the group and providing any additional appropriate information to feed the discussion.

QUESTIONS

ISSUE 1: Potential of sources identified and other sources to consider

Developed countries have committed, *"in the context of meaningful mitigation actions and transparency on implementation, to a goal of jointly mobilizing US$100bn per year by 2020 to address the needs of developing countries*". This funding will come from a variety of sources.

- *Do you consider that the variety of potential sources tackled by the IFI Report to the G20 could in principle bring sufficient revenues and predictable enough flows of finance to the fight against climate change and to reach in particular the goal of mobilizing $100bn a year?*
- *What other additional sources should the G20 also consider? For each of these sources, what measures would be required to mobilize them and what are the impediments, consequences and advantages of these measures? What could be the role of the G20 to move forward in this respect?*

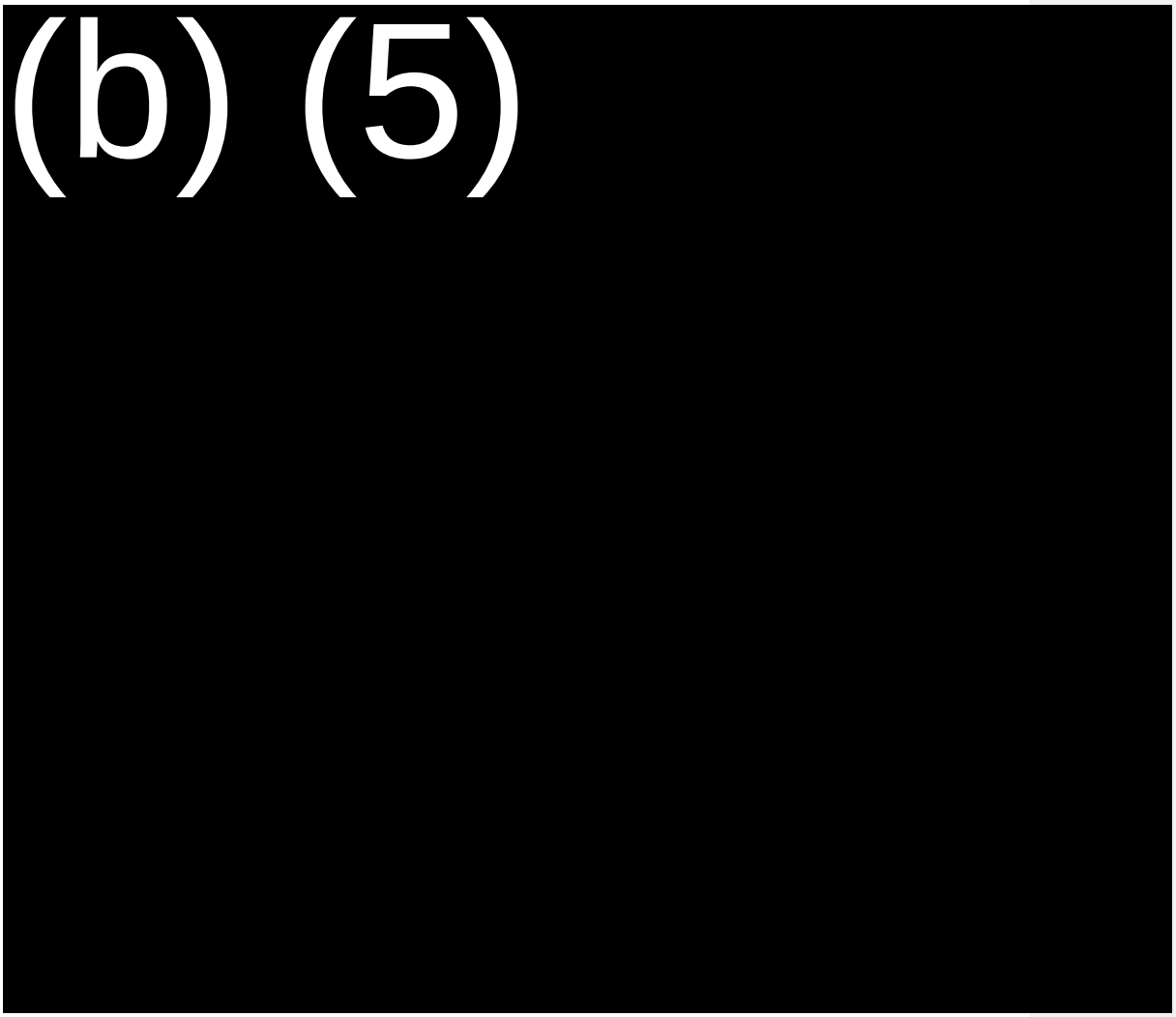
[redacted]

ISSUE 2: Carbon Pricing Instruments

Carbon pricing policies through taxes or emission trading schemes have been pilot-tested however not universally adopted for a number of reasons.

- *For countries that have not implemented carbon pricing policies, what are the major impediments for introducing such a policy and what can be done to overcome them?*
- *For countries with carbon pricing policies, would you consider it desirable to extend domestic carbon pricing policies (taxes or emission trading schemes) to more sectors in your own country and/or to more countries? What would be the impediments to doing this?*
- *What adverse outcomes can be foreseen and how could they be dealt with?*
- *What are the comparative advantages of specific sector carbon tax proposals and broader tax on domestic sources?*
- *To what extent could expected revenues be directed to international climate finance?*
- *What could be in your view the role of the G20, if any, in terms of a shared approach to carbon pricing policies?*

[redacted]



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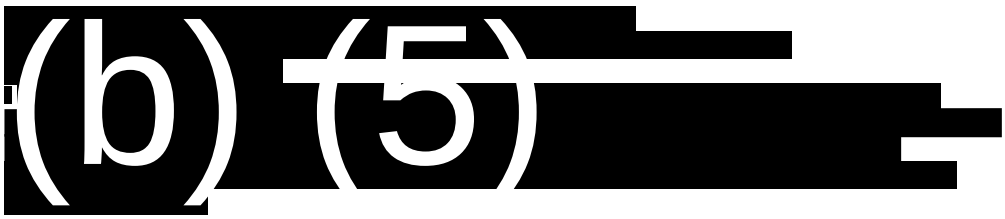
The IFI Report to the G20 considers that this modality may have very significant financing and mitigation potential.



- *What could be the difficulties and adverse consequences to the implementation of such measures and what would be the ways to overcome them? In particular, could adequate compensation mechanisms be designed to prevent negative impacts on developing countries?*
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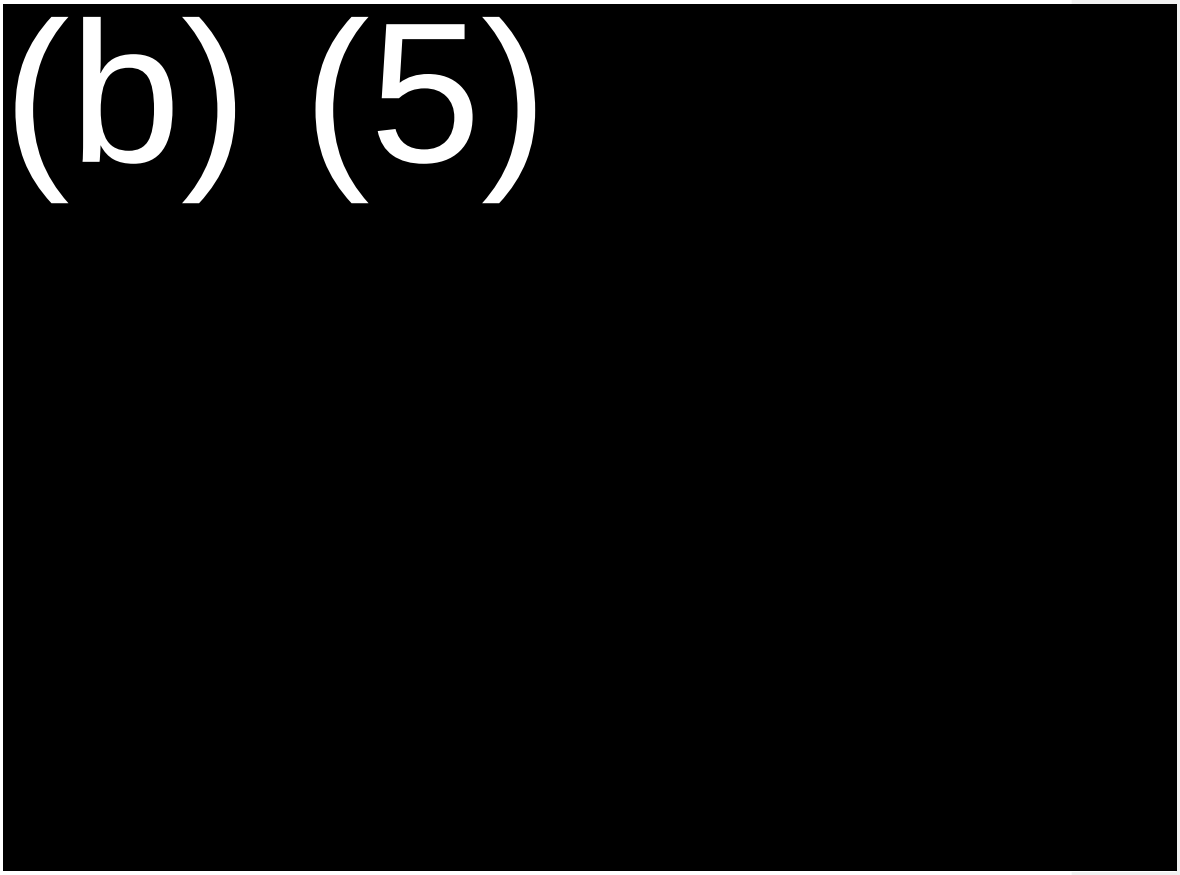

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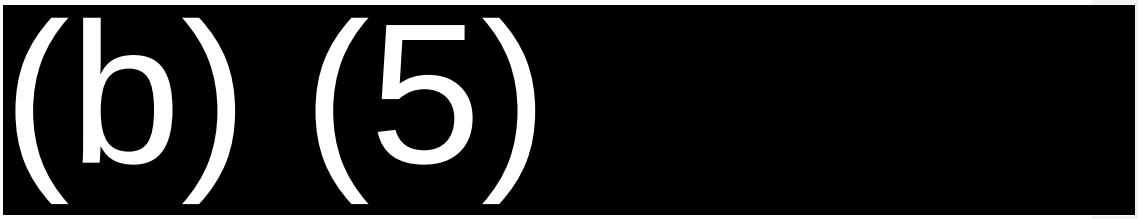

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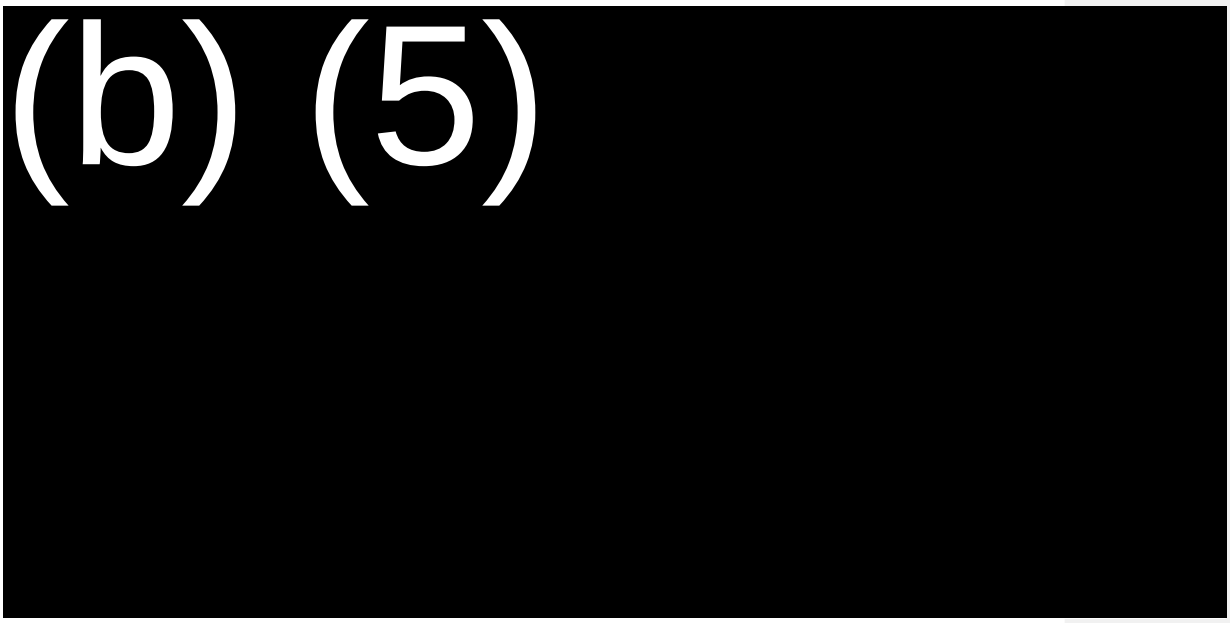

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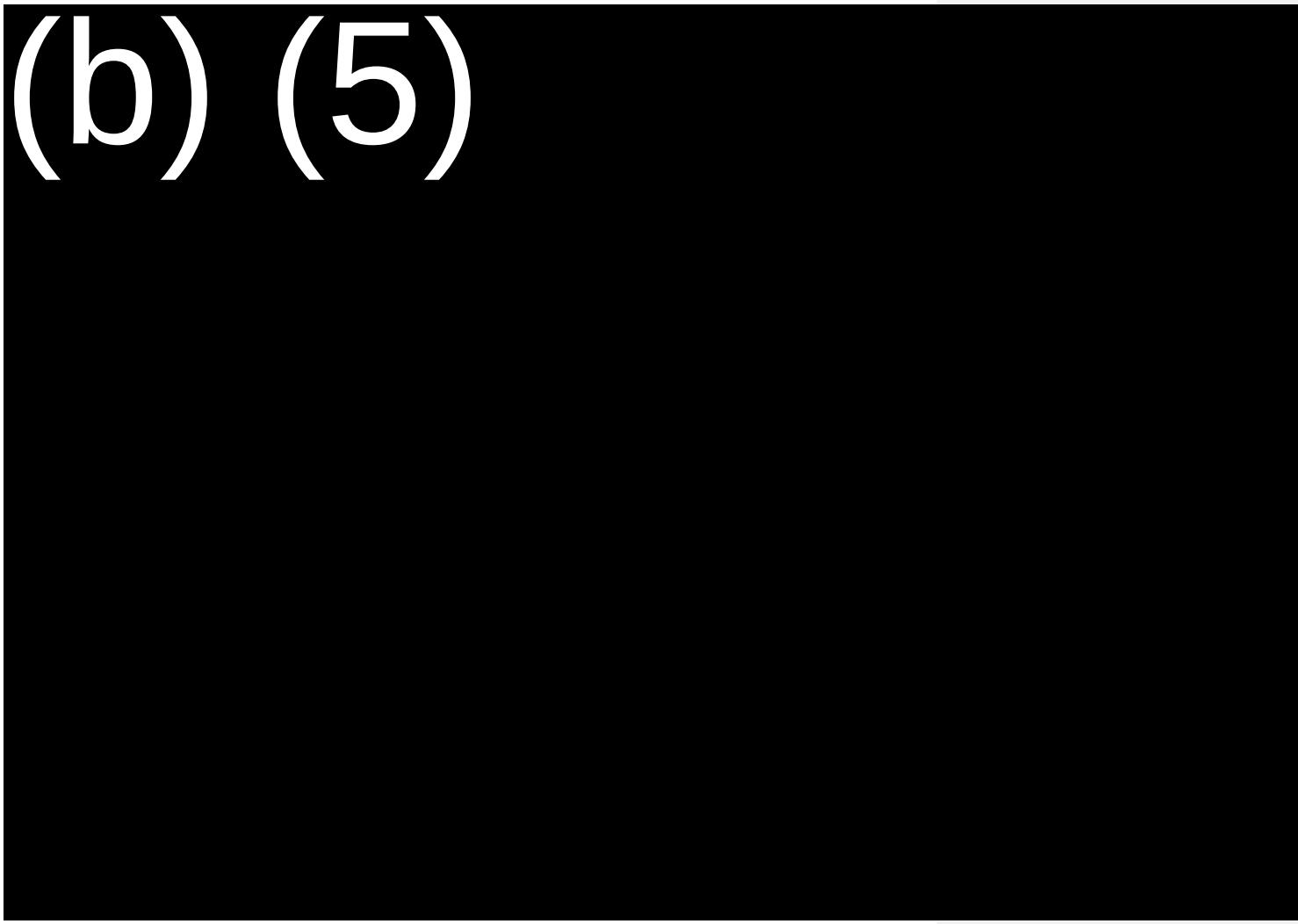
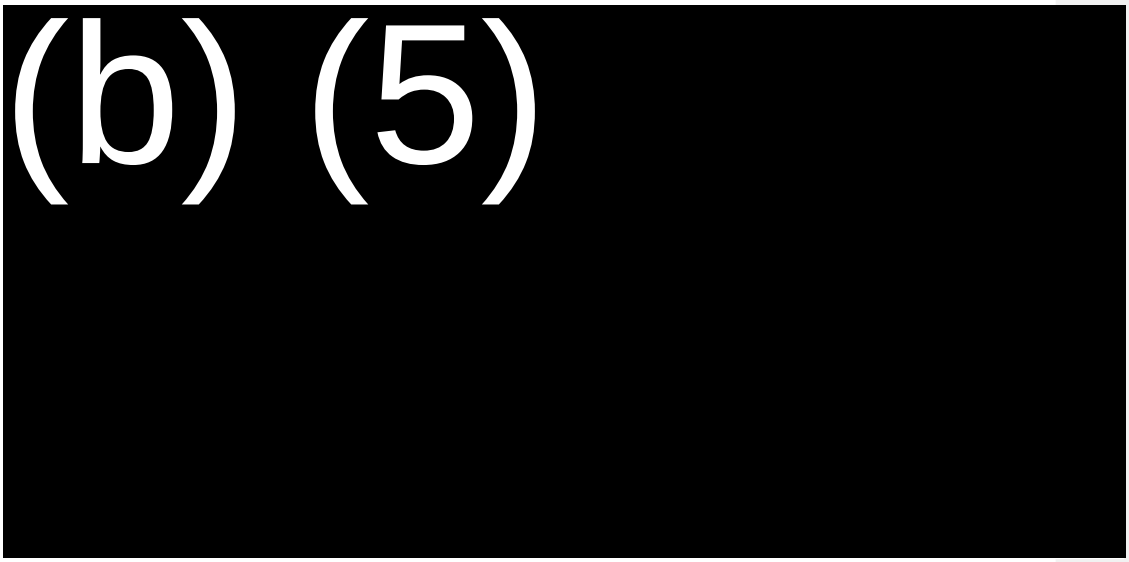


ISSUE 7: MDB resources

The *MDBs* also play a key role in leveraging financing flows, by using instruments such as loans, guarantees, grants or equity.

- *What role could MDB resources play with respect to climate finance?*
- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*



From: Jaffe, Judson
To: Tonkonogy, Bella
Cc: Berg, Katie
Subject: CFSG Questionnaire FINAL_US+State comments
Date: Tuesday, September 18, 2012 2:47:00 PM
Attachments: CFSG Questionnaire FINAL_US+State comments.docx

Here's my input on my question.

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

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(b) (5)

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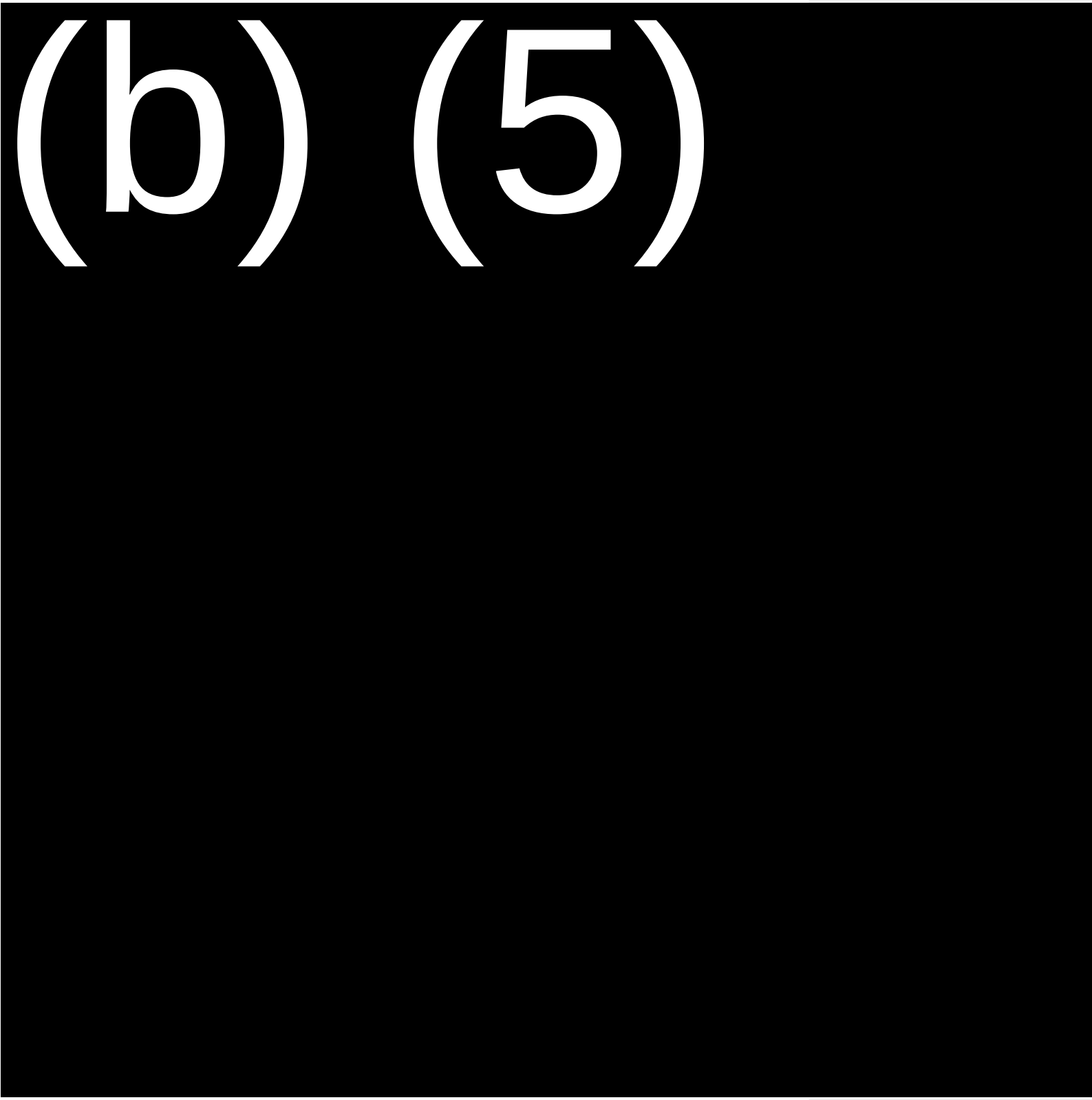
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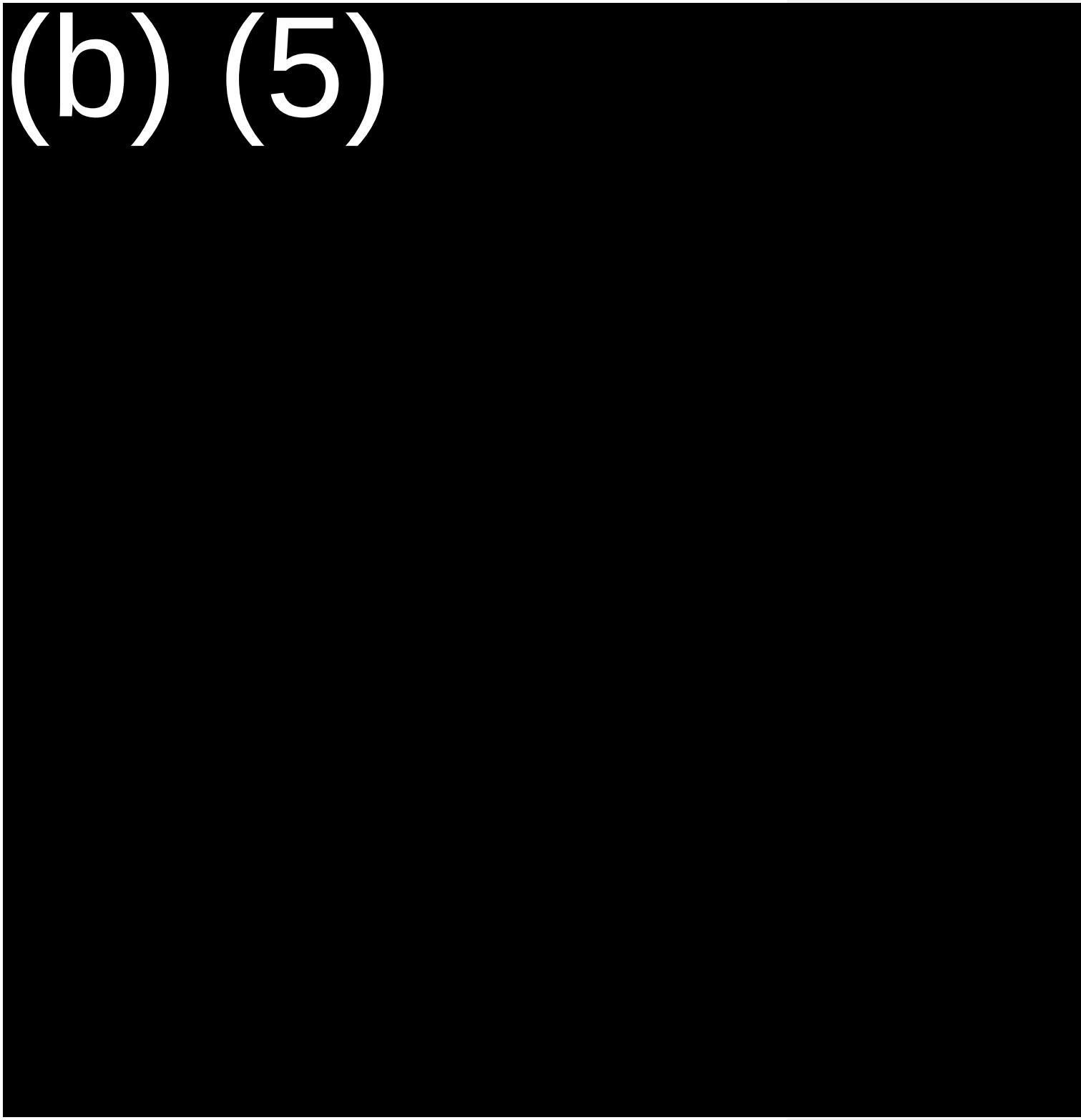
(b) (5)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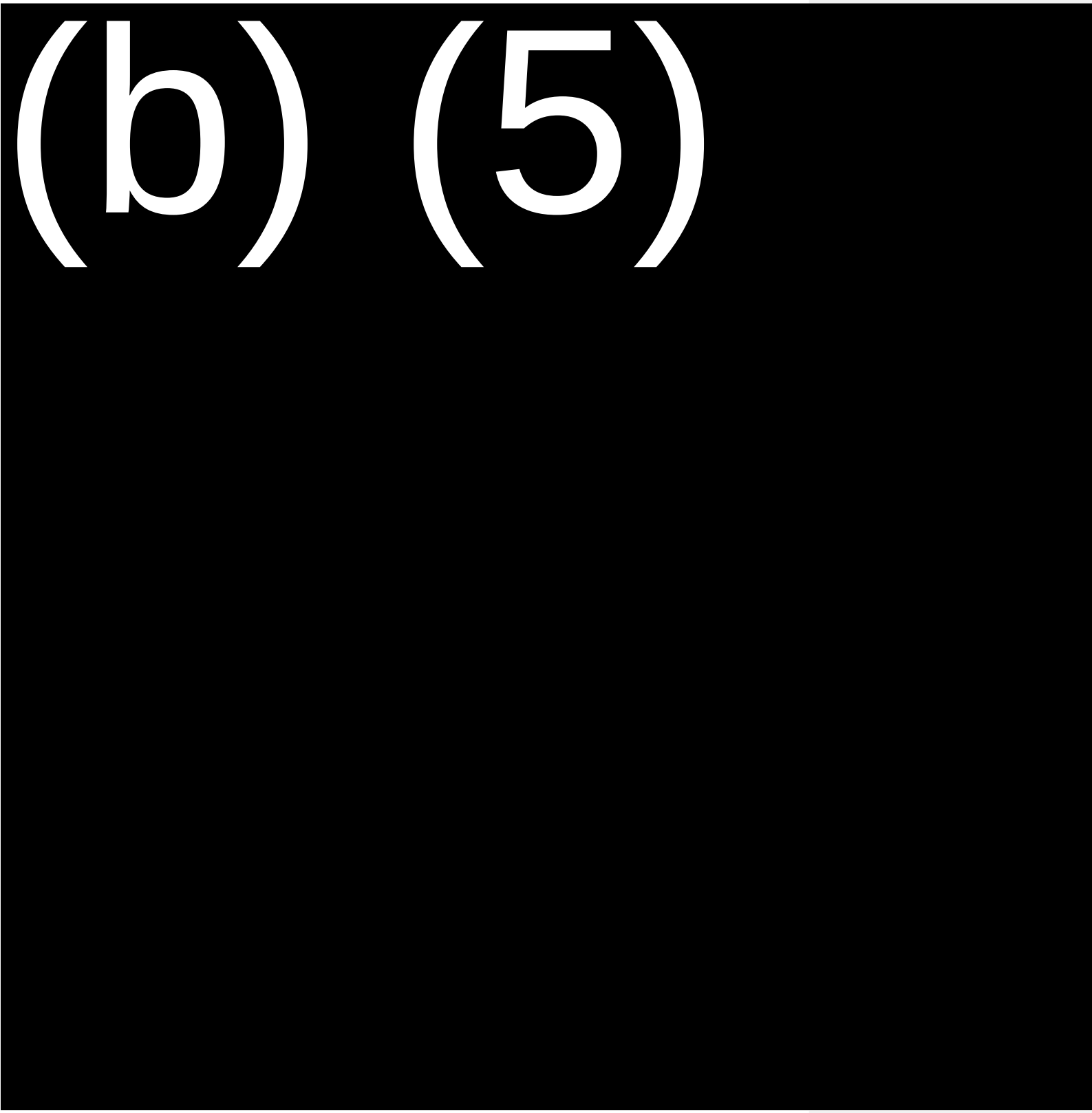
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From:	Tonkonogy, Bella
To:	"Kozloff, Keith"
Cc:	Berg, Katie
Subject:	FW: G20 climate finance questionnaire- responses for interagency review
Date:	Tuesday, September 18, 2012 3:40:00 PM
Attachments:	CFSG Questionnaire FINAL_US.DOCX CFSG TOR FINAL.DOCX

Keith-

My apologies for not including you on the initial clearance for the G20 questionnaire.

Let me know if you have any comments as soon as you can- hoping to get this out tomorrow.

(b) (5)
[redacted]

Thanks,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

From: Tonkonogy, Bella
Sent: Tuesday, September 18, 2012 12:01 PM
To: Tonkonogy, Bella; Demopulos, Abigail; Dennis, Benjamin; Carlson, Curtis; 'Carnahan, Kimberly C'; 'Maurice LeFranc'; 'Kelly, Alexia C'; 'Bodnar, Paul'; 'Brown, Jessica S'; 'carl.burleson@faa.gov'; Heil, Mark; Soares, Chris; 'Muehling.Brian@epamail.epa.gov'; 'Wayne.M.Lundy@uscg.mil'
Cc: Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)
Subject: RE: G20 climate finance questionnaire- responses for interagency review

All-

A friendly reminder to please provide comments/clearance on this questionnaire today.

Thank you,
Bella

From: Tonkonogy, Bella
Sent: Friday, September 14, 2012 4:48 PM
To: Demopulos, Abigail; Dennis, Benjamin; Carlson, Curtis; 'Carnahan, Kimberly C'; 'Maurice LeFranc'; 'Kelly, Alexia C'; 'Bodnar, Paul'; 'Brown, Jessica S'; 'carl.burleson@faa.gov'; Heil, Mark; Soares, Chris; 'Muehling.Brian@epamail.epa.gov'; 'Wayne.M.Lundy@uscg.mil'
Cc: Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)
Subject: G20 climate finance questionnaire- responses for interagency review

Dear Colleagues-

Please find attached draft questionnaire responses for the G20 Study Group on Climate

Finance for your comment and clearance by **noon on Tuesday, September 18.**

The Issues covered in the questionnaire are the following:
Issue 1: Potential of sources identified and other sources to consider
Issue 2: Carbon Pricing Instruments
Issue 3: Charges to mitigate emissions in international aviation and maritime transportation
Issue 4: Fossil Fuel Subsidy Reforms
Issue 5: Carbon Markets
Issue 6: Direct Budget Transfers and Instruments to engage private finance
Issue 7: MDB Resources

Background:
At the G20 Los Cabos Summit in June, Leaders welcomed the creation of a G20 Study Group on Climate Finance, "in order to consider ways to effectively mobilize resources." In response to this mandate, co-chairs France and South Africa, with support from Mexico, have developed a questionnaire for study group members (all G20 countries) to complete on mobilizing climate finance. This questionnaire is a follow on from a report prepared last year for the G20 by the World Bank, OECD, and the Regional Development Banks on "Mobilizing Climate Finance." The sources of finance described in that report include, among others, carbon markets, bunker fuel levies, private sector, etc.

Ultimately, the questionnaire responses and a face to face meeting on September 23 in Mexico will feed into a progress report to be presented by the study group to Ministers in November. The attached TOR provides more details on the mandate of this group and its tasks if you would like more background.

The responses are due to the Co-chairs on September 19 so thank you in advance for your quick turnaround.

Please let me know if you have questions.

Best regards,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

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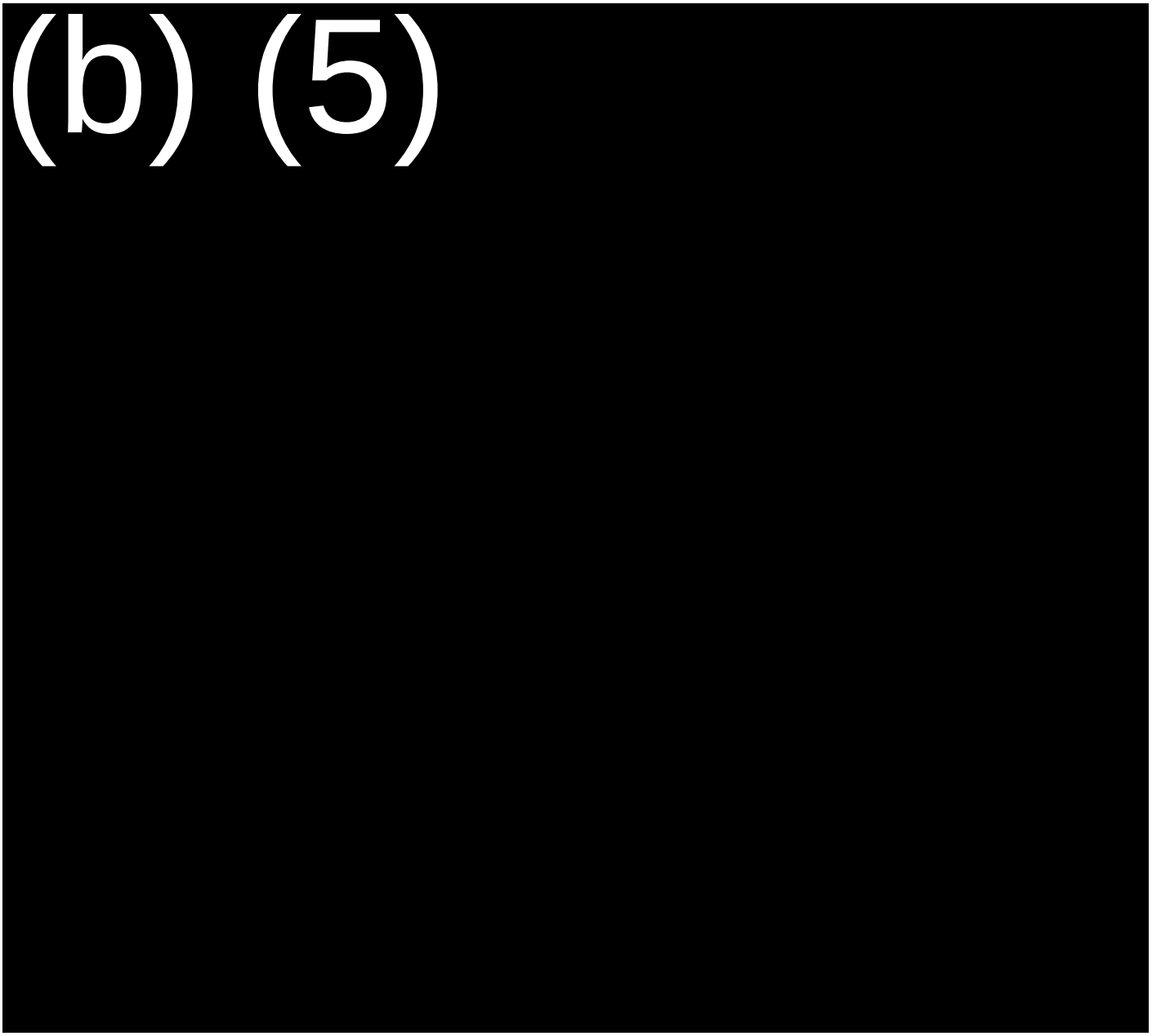

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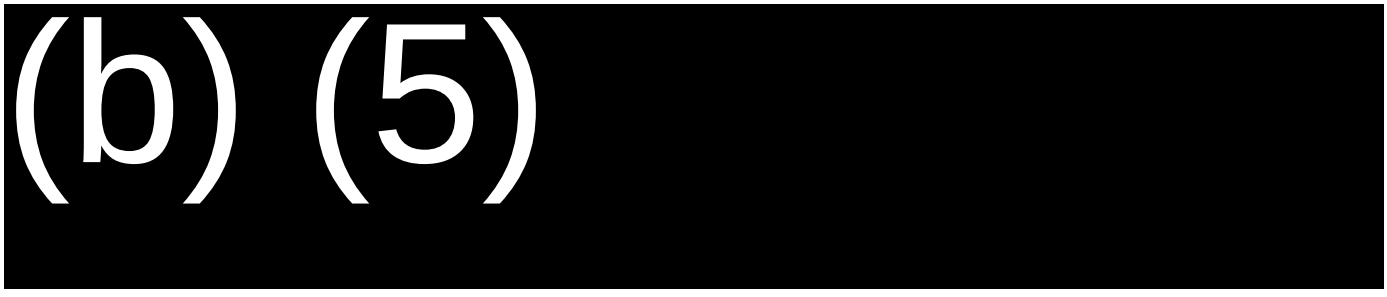

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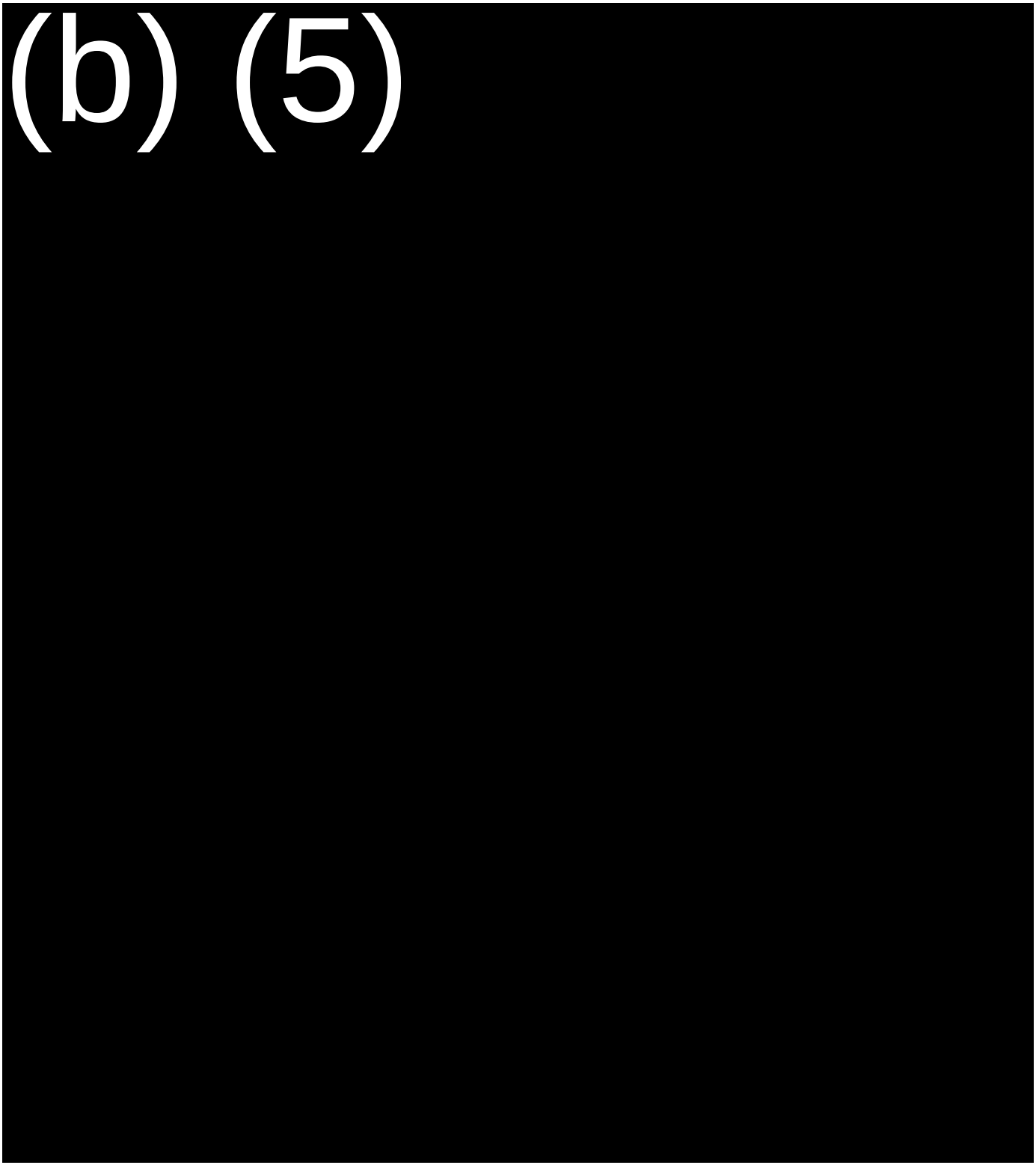

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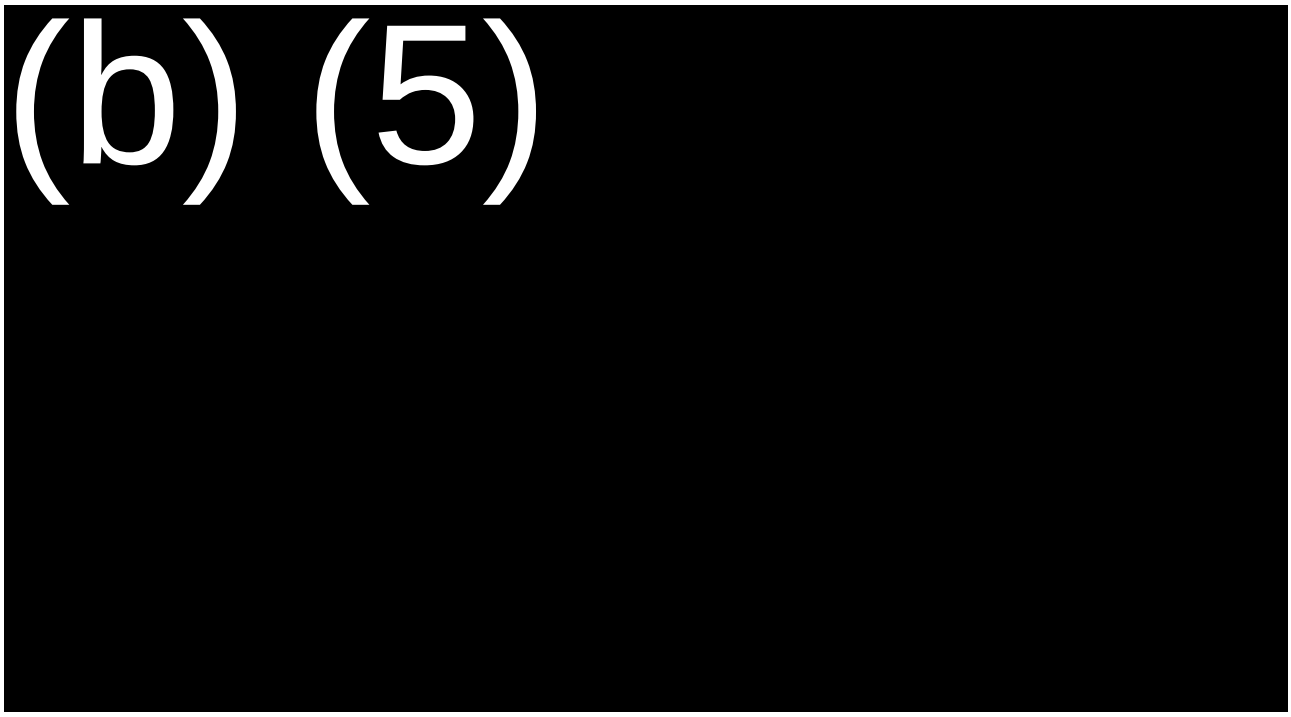

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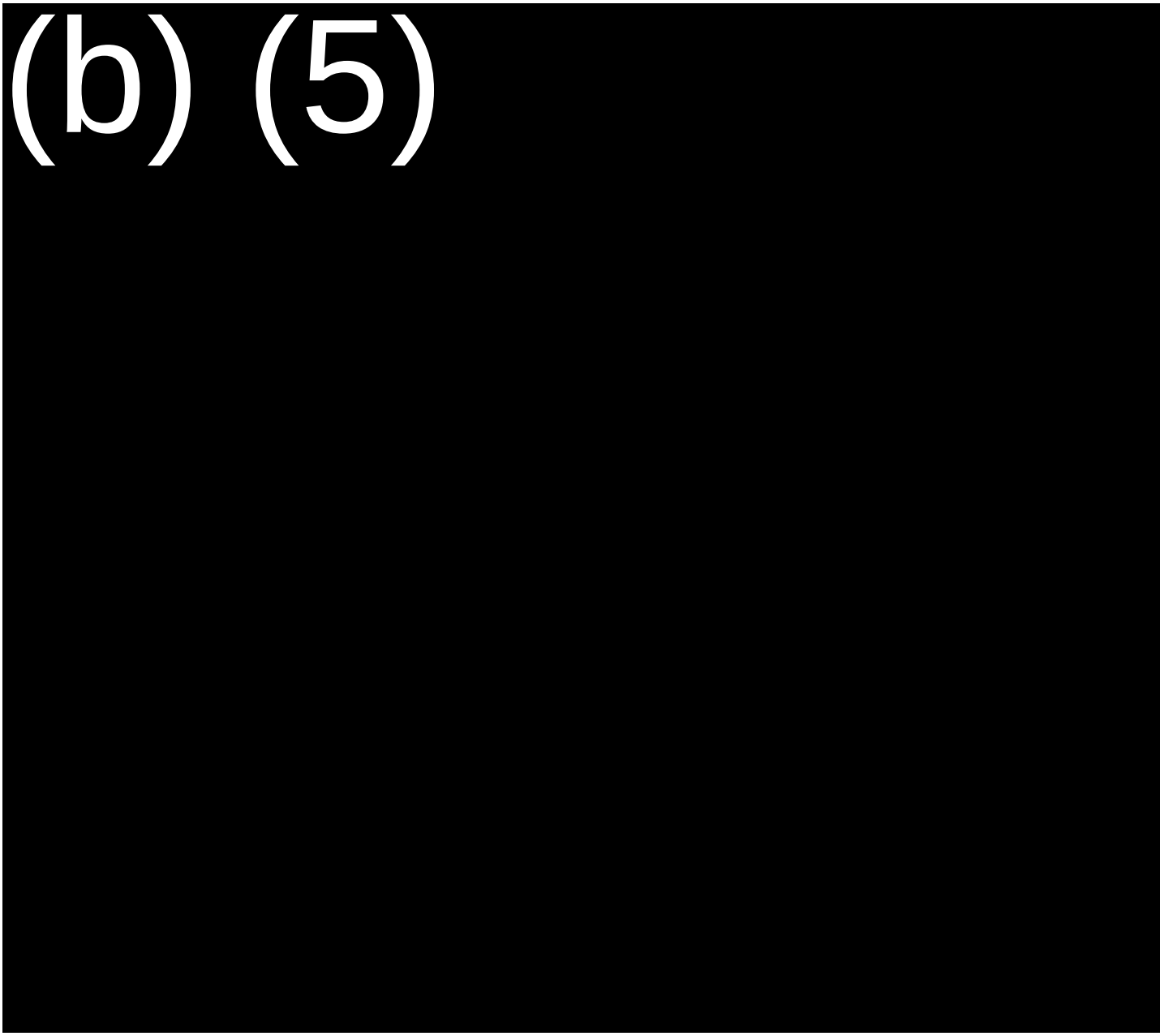

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- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*

G20 STUDY GROUP ON CLIMATE FINANCE
TERMS OF REFERENCE

5 September 2012

MANDATE (see also Annexure)

- *13. We will continue to work on climate finance with the establishment of a G20 study group to consider ways to effectively mobilize resources and support the operationalization process of the Green Climate Fund taking into account the objectives, provisions and principles of the UNFCCC. [**G20 Finance Ministers and Central Bank Governors, Washington DC, April 2012**]*

- *71. … We welcome the creation of the G20 study group on climate finance, in order to consider ways to effectively mobilize resources taking into account the objectives, provisions and principles of the UNFCCC in line with the Cancun Agreement and ask to provide a progress report to Finance Ministers in November". [**G20 Leaders Declaration, Los Cabos, June 2012**]*

PURPOSE

G20 Heads of State have identified the need for stronger engagement and cooperation to fight climate change in several declarations since 2009 (see Annexure). In light of the above statements, the purpose of the study group created this year is to seek to build stronger consensus among the G20 members on ways to effectively mobilize resources in support of the broader multilateral processes underway, including to contribute to the work of the UNFCCC.

FOCUS

At their meeting in 2012, the Leaders reiterated their 2011 mandate for G20 Finance Ministers: *to consider ways to effectively mobilize resource*s. The work of the study group is strictly framed by this mandate.

G20 Finance Ministers have been presented, but not endorsed, two reports on the question of Climate Finance at their previous meetings: the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing (AGF Report)* in November 2010 and *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers*, coordinated by the World Bank and the IMF, in October 2011.

The study group provides an opportunity to discuss among others the content of these analyses and advance consideration of climate finance sources.

PARTICIPATION

The discussion of options will take place amongst the G20 members participating in the study group. In undertaking their work, the group may request the technical support provided by IOs or other entities, as needed; yet the G20 members of the group will be solely responsible for submitting any agreed deliverable to the Finance Ministers.

WORK OF THE STUDY GROUP

Taking into account the short timeframe on which to deliver on this instruction from Leaders, the study group will pursue the following activities:

1. Review lessons learned on how to effectively mobilize climate finance from experiences to date (notably based on reporting from UNFCCC, as well as information provided by G20 members, IFIs and other relevant fora).
2. Review the options for effectively mobilizing resources outlined in the reports presented to G20 Finance Ministers, as well as other potential options, and receive any additional analysis from G20 members;
3. Exchange views on these options, taking into account all potential impacts, and their implications taking into account the objectives, provisions and principles of UNFCCC.

DELIVERABLES

The study group will provide a progress report to the G20 Finance Ministers on the possible ways to effectively mobilize resources for Climate Finance. This may include an assessment of where specific technical and other analysis may be helpful in supporting the effort to build a common understanding within the G20 membership.

TENTATIVE WORK PROGRAM & CALENDAR

August	Agreement on the TOR Agreement on the questionnaire Agreement on a date and venue for the face to face meeting required to draft the report
September	Country returns of questionnaires Face to face meeting towards an agreed draft report on the progress of the study group, based on country responses to the questionnaires (Sept. 23, Mexico City)
October	Agreement on the progress report
November	Submission of the progress report to Ministers

ANNEXURE

2009: *'33. we welcome the work of the Finance Ministers* ***and direct them to report back at their next meeting with a range of possible options for climate change financing*** *to be provided as a resource to be considered in the UNFCCC negotiations at Copenhagen'* (Pittsburgh)

2010: *'41. We reiterate our commitment to a green recovery and to sustainable global growth. Those of us who have associated with the Copenhagen Accord reaffirm our support for it and its implementation and call on others to associate with it. We are committed to engage in negotiations under the UNFCCC on the basis of its objective provisions and principles including common but differentiated responsibilities and respective capabilities and are determined to ensure a successful outcome through an inclusive process at the Cancun Conferences. ….* ***We look forward to the outcome of the UN Secretary-General's High-Level Advisory Group on Climate Change Financing which is, inter alia, exploring innovative financing.*** *42. We note with appreciation the report on energy subsidies from the International Energy Agency (IEA), Organization of the Petroleum Exporting Countries (OPEC), OECD and World Bank. We welcome the work of Finance and Energy Ministers in delivering implementation strategies and timeframes, based on national circumstances, for the rationalization and phase out over the medium term of inefficient fossil fuel subsidies that encourage wasteful consumption, taking into account vulnerable groups and their development needs. We also encourage continued and full implementation of country specific strategies and will continue to review progress towards this commitment at upcoming summits'* (Toronto)

2010: *'66. … In this regard we* ***welcome the work of the High-level Advisory Group on Climate Change Financing established by the UN Secretary General and ask our Finance Ministers to consider its report****. We also support and encourage the delivery of fast-start finance commitments'* (Seoul)

2011: *'63. Financing the fight against climate change is one of our main priorities. In Copenhagen, developed countries have committed to the goal of mobilizing jointly USD 100 billion per year from all sources by 2020 to assist developing countries to mitigate and adapt to the impact of climate change, in the context of meaningful mitigation actions and transparency.* ***We discussed the World Bank -- IMF -- OECD -- regional development banks report on climate finance and call for continued work taking into account the objectives, provisions and principles of the UNFCCC by international financial institutions and the relevant UN organizations****.* ***We ask our Finance Ministers to report to us at our next Summit on progress made on climate finance****; 64. We reaffirm that climate finance will come from a wide variety of sources, public and private, bilateral and multilateral, including innovative sources of finance. We recognize the role of public finance and public policy in supporting climate-related investments in developing countries. We underline the role of the private sector in supporting climate-related investments globally, particularly through various market-based mechanisms and also call on the MDBs to develop new and innovative financial instruments to increase their leveraging effect on private flows*. (Cannes)

From:	Carlson, Curtis
To:	Tonkonogy, Bella; Demopulos, Abigail; Dennis, Benjamin; "Carnahan, Kimberly C"; "Maurice LeFranc"; "Kelly, Alexia C"; "Bodnar, Paul"; "Brown, Jessica S"; "carl.burleson@faa.gov"; Heil, Mark; Soares, Chris; "Muehling.Brian@epamail.epa.gov"; "Wayne.M.Lundy@uscg.mil"; Gerardi, GeraldineDisabled
Cc:	Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)Disabled
Subject:	RE: G20 climate finance questionnaire- responses for interagency review
Date:	Tuesday, September 18, 2012 5:14:39 PM
Attachments:	CFSG Questionnaire FINAL_US_cc.docx

With the attachment this time.

Curtis

Curtis Carlson
Office of Tax Analysis
U.S. Department of the Treasury
202-622-0130
curtis.carlson@treasury.gov

From: Tonkonogy, Bella
Sent: Tuesday, September 18, 2012 12:01 PM
To: Tonkonogy, Bella; Demopulos, Abigail; Dennis, Benjamin; Carlson, Curtis; 'Carnahan, Kimberly C'; 'Maurice LeFranc'; 'Kelly, Alexia C'; 'Bodnar, Paul'; 'Brown, Jessica S'; 'carl.burleson@faa.gov'; Heil, Mark; Soares, Chris; 'Muehling.Brian@epamail.epa.gov'; 'Wayne.M.Lundy@uscg.mil'
Cc: Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)
Subject: RE: G20 climate finance questionnaire- responses for interagency review

All-

A friendly reminder to please provide comments/clearance on this questionnaire today.

Thank you,
Bella

From: Tonkonogy, Bella
Sent: Friday, September 14, 2012 4:48 PM
To: Demopulos, Abigail; Dennis, Benjamin; Carlson, Curtis; 'Carnahan, Kimberly C'; 'Maurice LeFranc'; 'Kelly, Alexia C'; 'Bodnar, Paul'; 'Brown, Jessica S'; 'carl.burleson@faa.gov'; Heil, Mark; Soares, Chris; 'Muehling.Brian@epamail.epa.gov'; 'Wayne.M.Lundy@uscg.mil'
Cc: Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)
Subject: G20 climate finance questionnaire- responses for interagency review

Dear Colleagues-

Please find attached draft questionnaire responses for the G20 Study Group on Climate Finance for your comment and clearance by **noon on Tuesday, September 18.**

The Issues covered in the questionnaire are the following:
Issue 1: Potential of sources identified and other sources to consider
Issue 2: Carbon Pricing Instruments
Issue 3: Charges to mitigate emissions in international aviation and maritime transportation
Issue 4: Fossil Fuel Subsidy Reforms
Issue 5: Carbon Markets

Issue 6: Direct Budget Transfers and Instruments to engage private finance
Issue 7: MDB Resources

Background:
At the G20 Los Cabos Summit in June, Leaders welcomed the creation of a G20 Study Group on Climate Finance, "in order to consider ways to effectively mobilize resources." In response to this mandate, co-chairs France and South Africa, with support from Mexico, have developed a questionnaire for study group members (all G20 countries) to complete on mobilizing climate finance. This questionnaire is a follow on from a report prepared last year for the G20 by the World Bank, OECD, and the Regional Development Banks on "Mobilizing Climate Finance." The sources of finance described in that report include, among others, carbon markets, bunker fuel levies, private sector, etc.

Ultimately, the questionnaire responses and a face to face meeting on September 23 in Mexico will feed into a progress report to be presented by the study group to Ministers in November. The attached TOR provides more details on the mandate of this group and its tasks if you would like more background.

The responses are due to the Co-chairs on September 19 so thank you in advance for your quick turnaround.

Please let me know if you have questions.

Best regards,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

INTRODUCTION

The study group will report to G20 Finance Ministers on the state of discussion among members on ways to effectively mobilize resources for Climate Finance.

Among other analysis on which the work of the group can build upon are two reports already presented to G20 Finance Ministers but not yet discussed in significant detail. These are: *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers* (IFI Report to the G20) in 2011; and the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing* (AGF Report) in 2010. The AGF report provided an overview of a number of potential sources and the IFI report to the G20 elaborated on these providing additional details on the economic and financial rationale of the potential sources, their incidence and some issues to be dealt with for implementation.

The purpose of this Questionnaire is to initiate the work of the study group, by fostering an exchange views on options outlined in the aforementioned reports, as well as other options or potential issues not yet explored. The Questionnaire provides a tentative framework to organize the discussion, while leaving G20 members participating to the study group with all freedom to express their views on these and any other subject they judge adequate in the frame of the group and providing any additional appropriate information to feed the discussion.

QUESTIONS

ISSUE 1: Potential of sources identified and other sources to consider

Developed countries have committed, *"in the context of meaningful mitigation actions and transparency on implementation, to a goal of jointly mobilizing US$100bn per year by 2020 to address the needs of developing countries*". This funding will come from a variety of sources.

- *Do you consider that the variety of potential sources tackled by the IFI Report to the G20 could in principle bring sufficient revenues and predictable enough flows of finance to the fight against climate change and to reach in particular the goal of mobilizing $100bn a year?*
- *What other additional sources should the G20 also consider? For each of these sources, what measures would be required to mobilize them and what are the impediments, consequences and advantages of these measures? What could be the role of the G20 to move forward in this respect?*

[redacted]

ISSUE 2: Carbon Pricing Instruments

Carbon pricing policies through taxes or emission trading schemes have been pilot-tested however not universally adopted for a number of reasons.

- *For countries that have not implemented carbon pricing policies, what are the major impediments for introducing such a policy and what can be done to overcome them?*
- *For countries with carbon pricing policies, would you consider it desirable to extend domestic carbon pricing policies (taxes or emission trading schemes) to more sectors in your own country and/or to more countries? What would be the impediments to doing this?*
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[redacted]

(b)(5)

[redacted]

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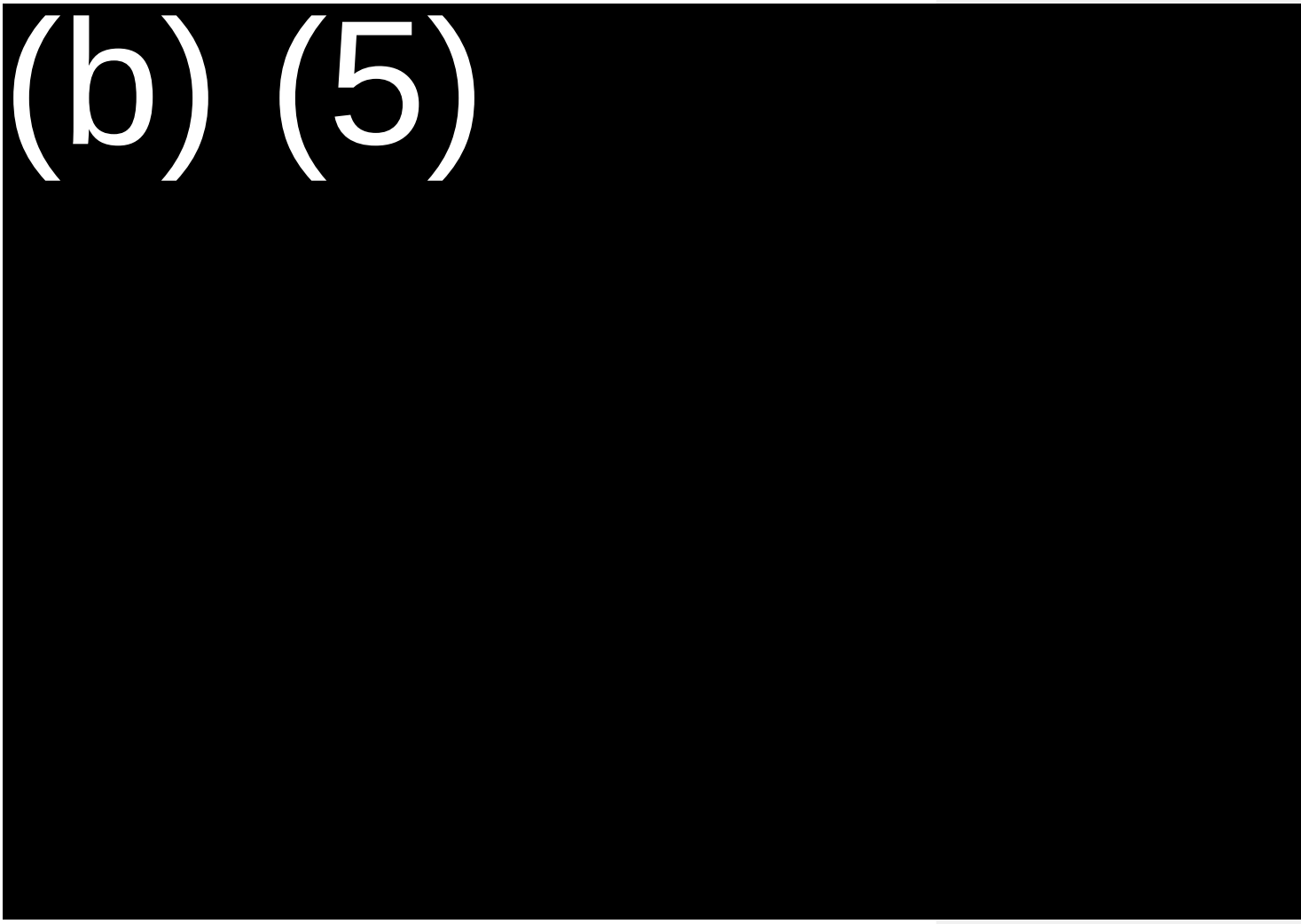

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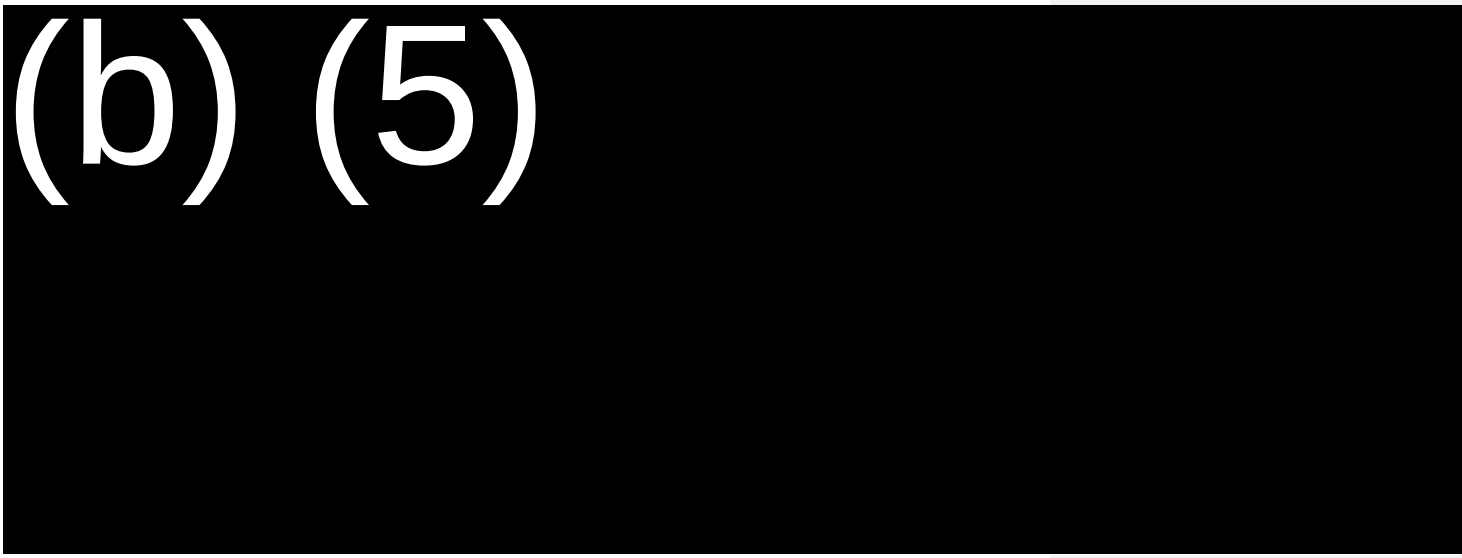

From:	Tonkonogy, Bella
To:	"Maurice LeFranc"; Heil, Mark
Cc:	Hall, Daniel; Berg, Katie; Jaffe, Judson
Subject:	updated G20 questionnaire
Date:	Tuesday, September 18, 2012 6:12:50 PM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US.docx

Maurice, Mark-

If either of you wish to comment, attached is the updated version of the G20 study group questionnaire, incorporating State and FAA comments, as well as some internal Treasury. I'm also still working out one paragraph on private sector. Any additional comments appreciated first thing tomorrow.

Thanks,
Bella

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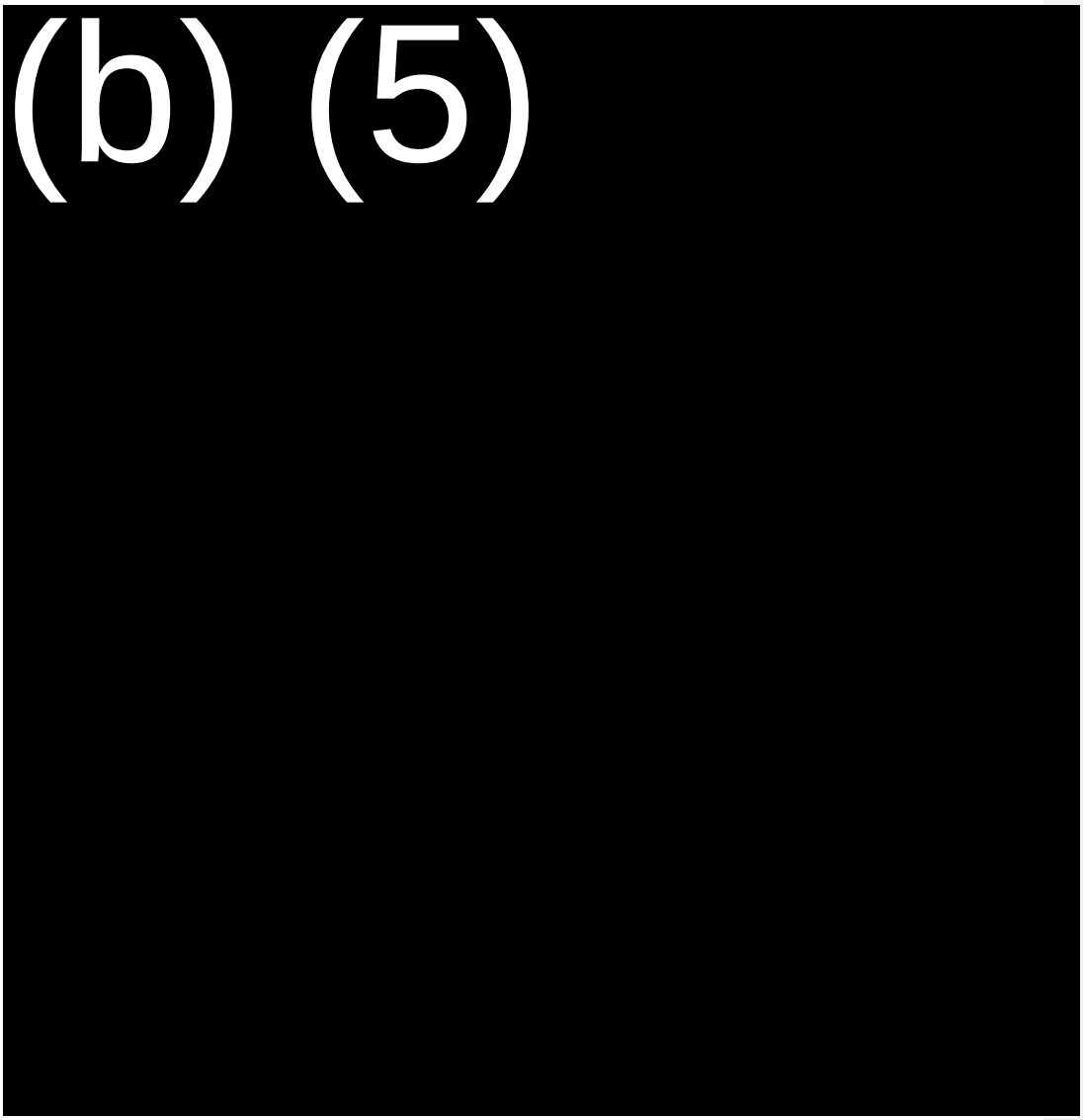

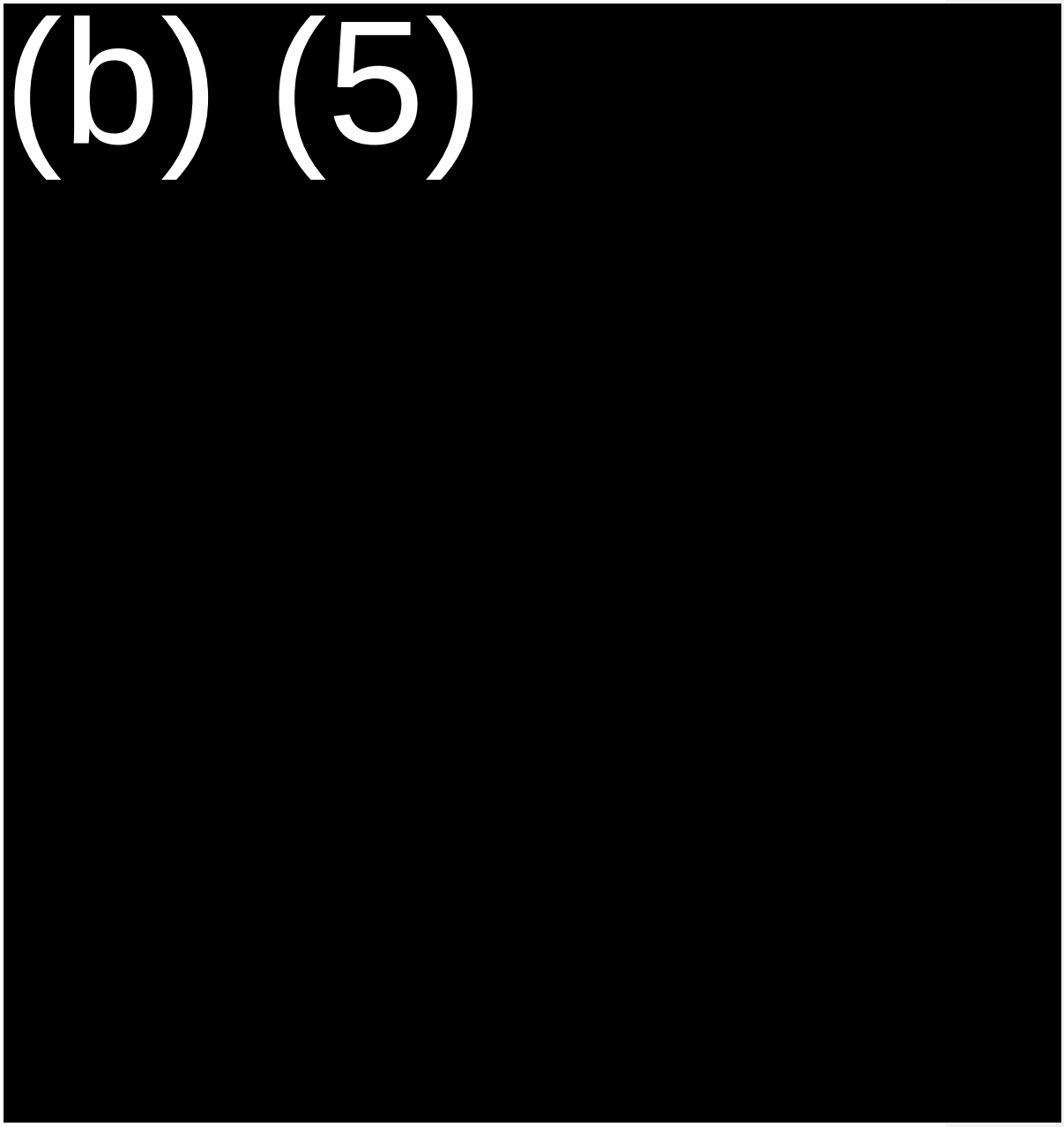

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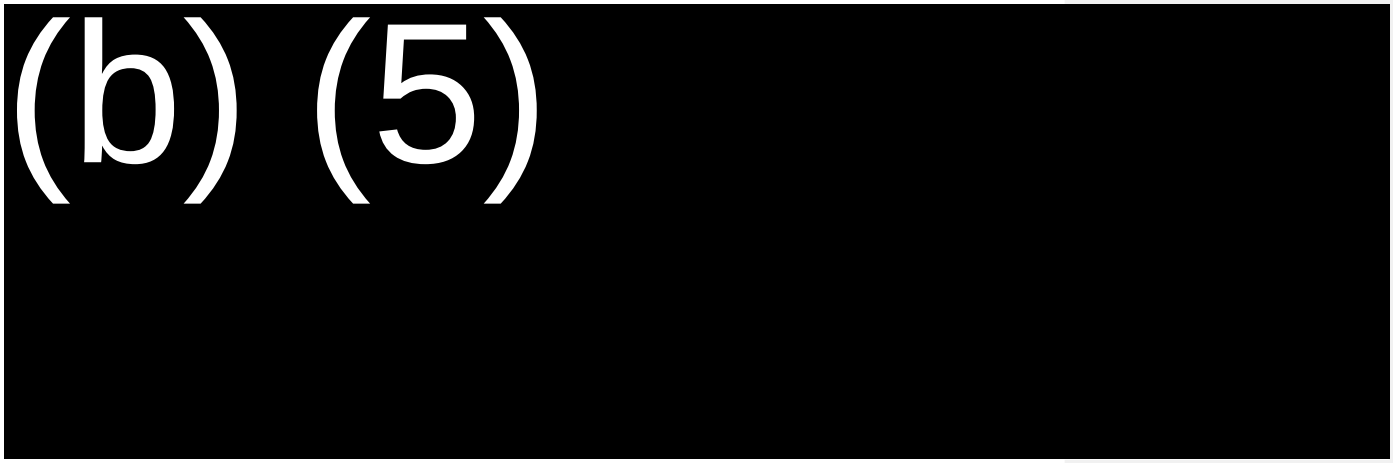

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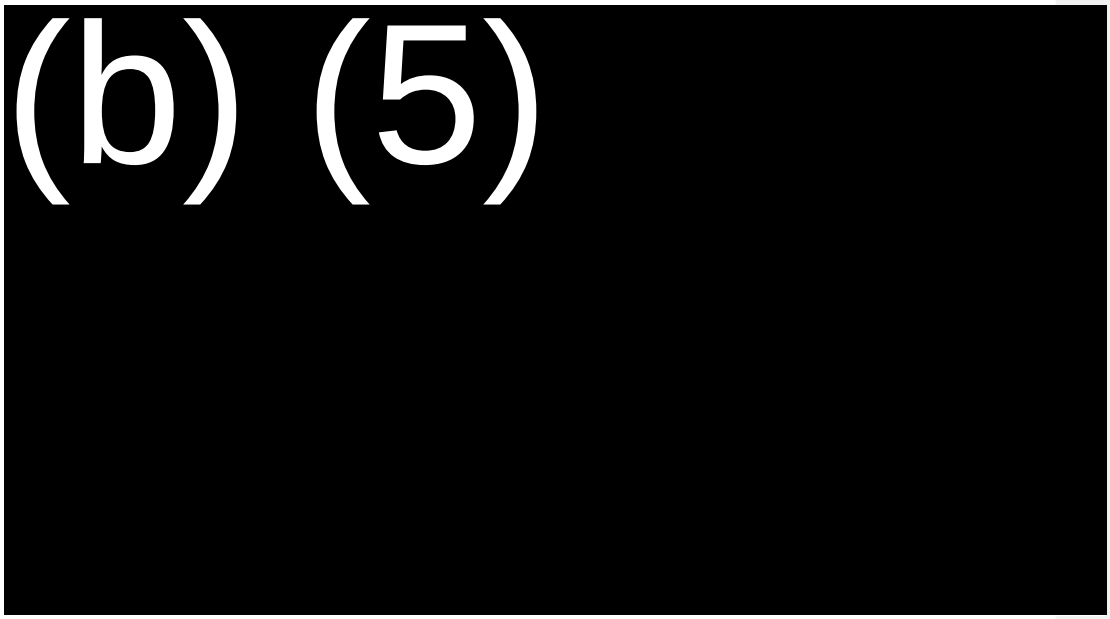

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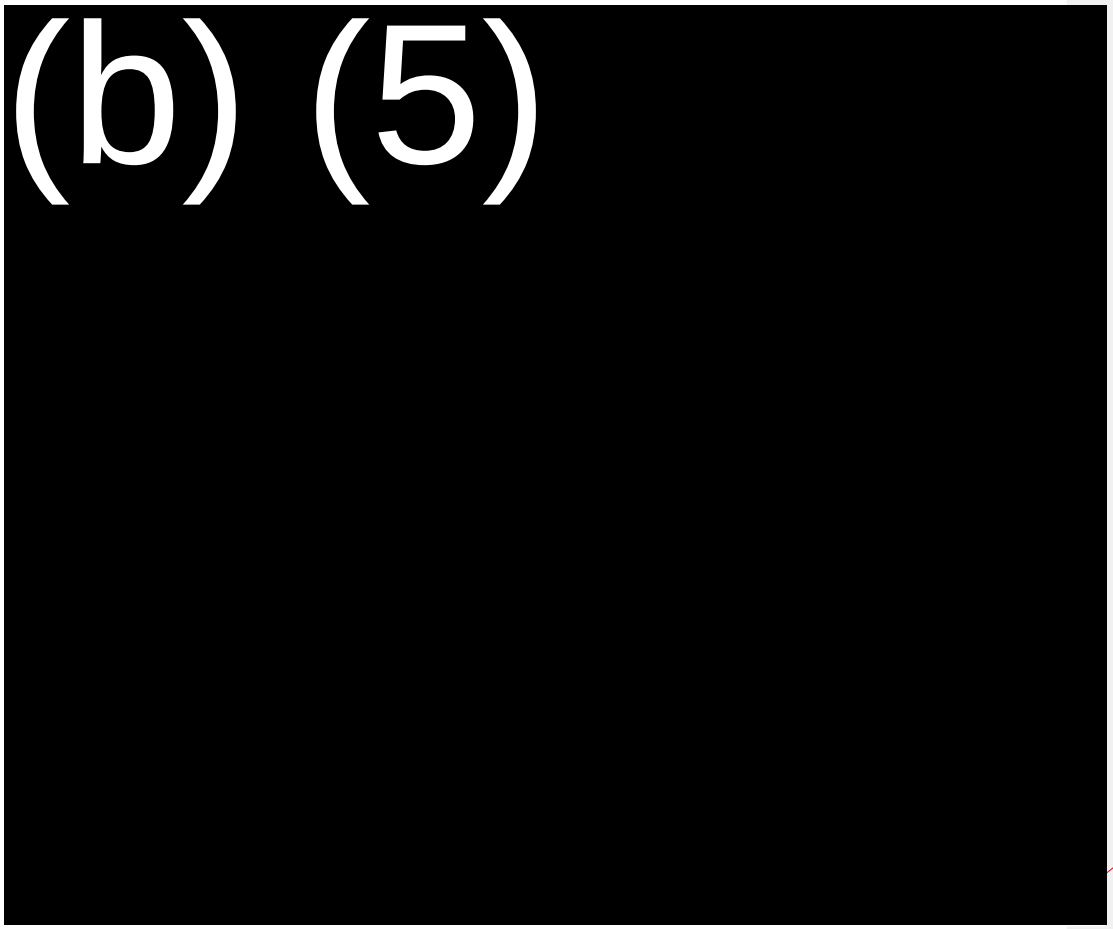

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(b) (5)

Formatted: English (U.S.)

From:	Tonkonogy, Bella
To:	Metcalf, GilbertDisabled; Urbanas, Elizabeth (Beth)Disabled
Cc:	Jaffe, Judson; Hall, Daniel; Berg, Katie; Lien, Elizabeth; Demopulos, Abigail; Tonkonogy, Bella
Subject:	G20 questionnaire
Date:	Tuesday, September 18, 2012 6:26:51 PM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US.docx

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Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

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QUESTIONNAIRE

Revised 5 September 2012

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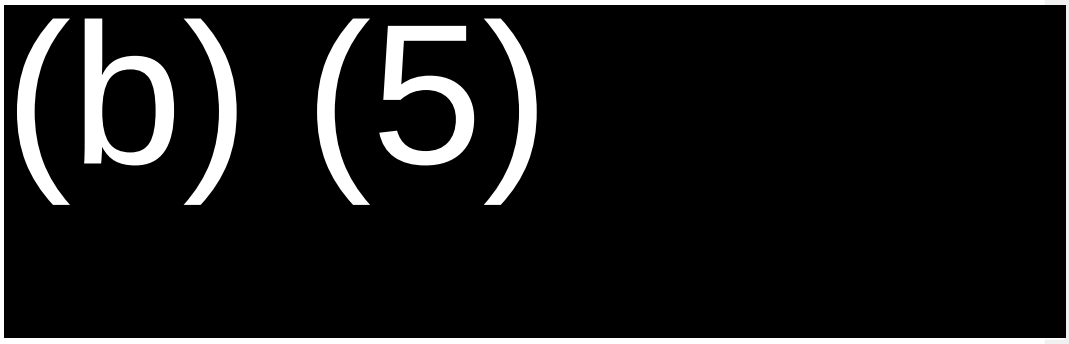

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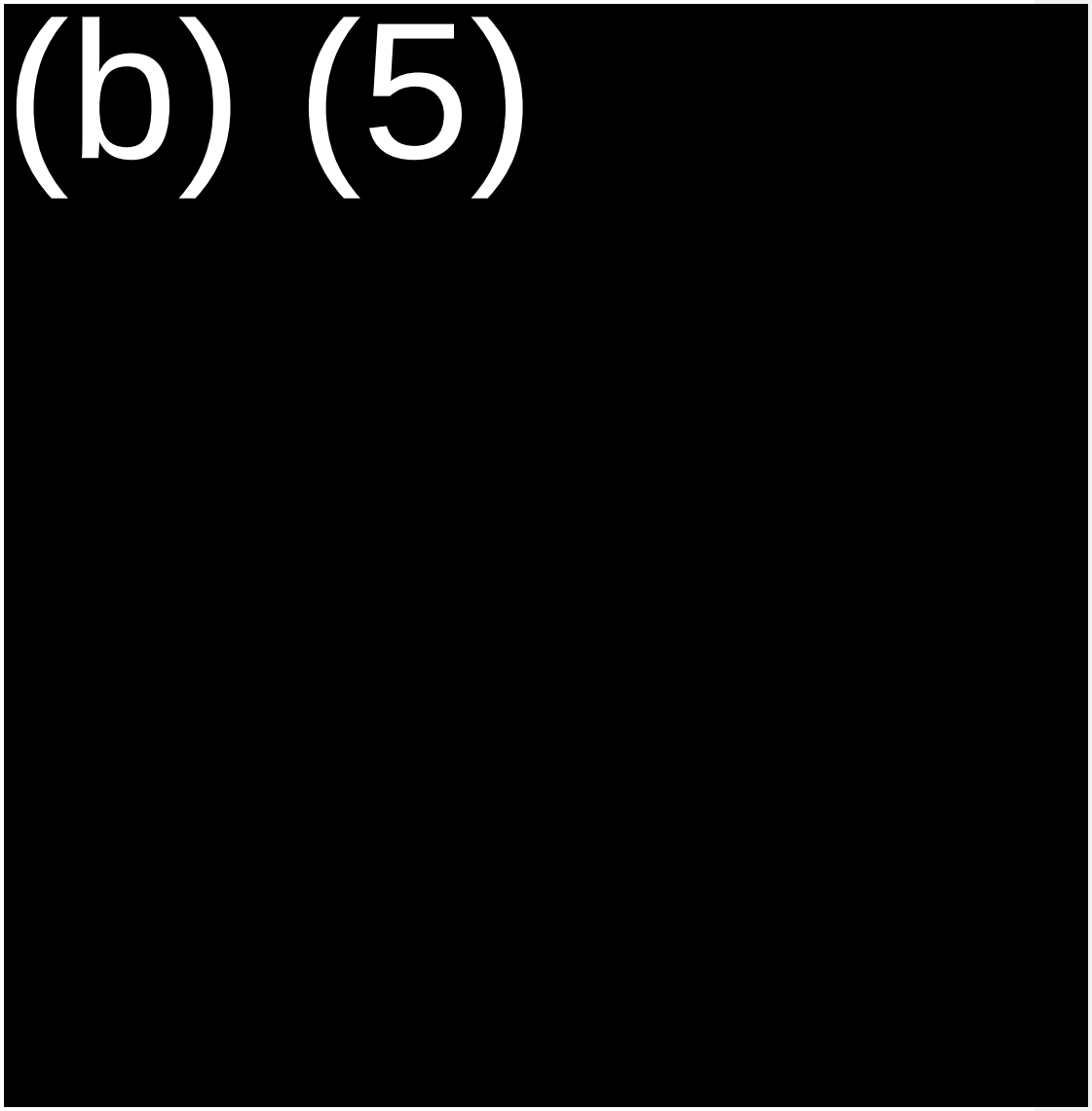

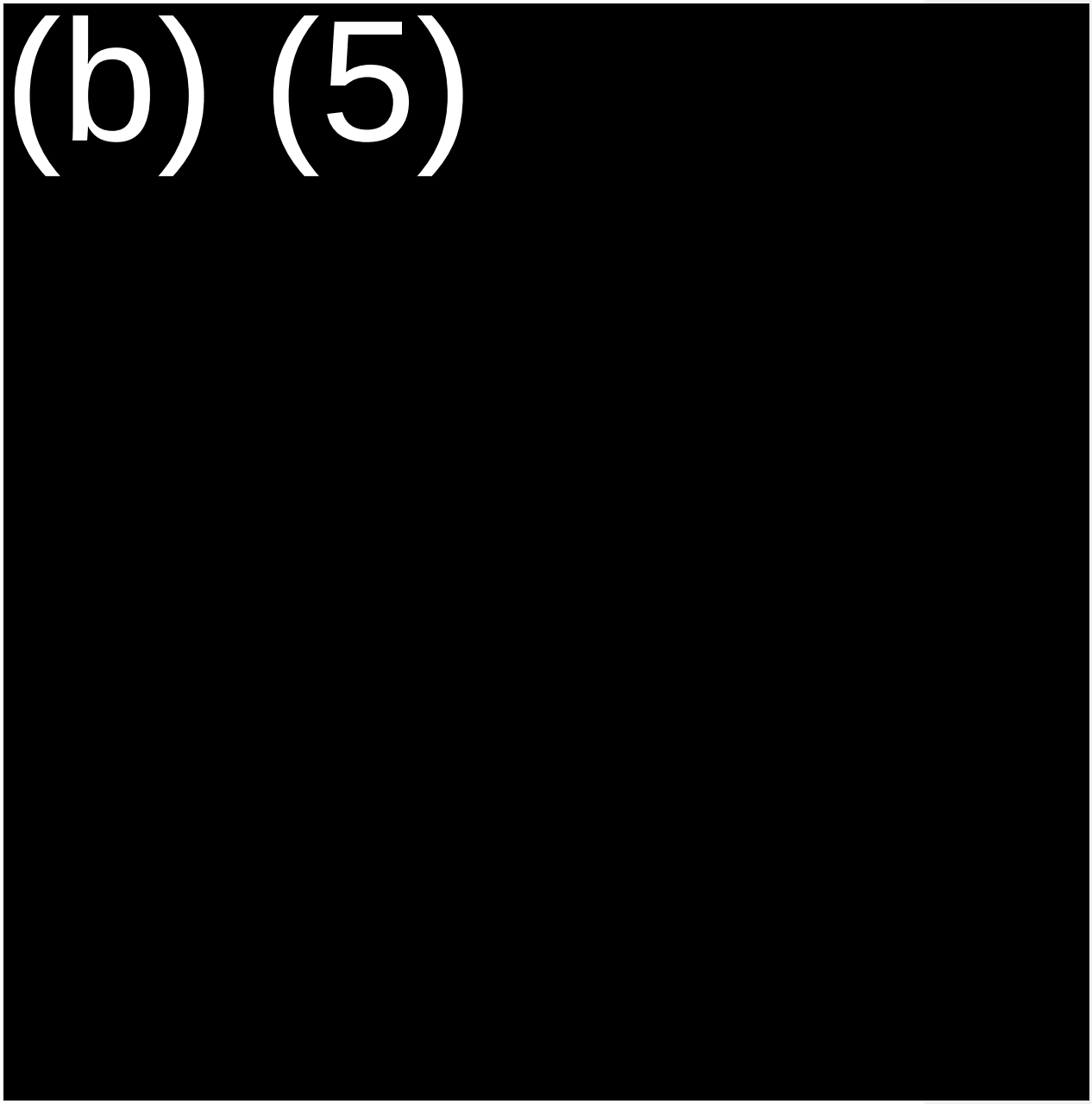

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(b) (5)

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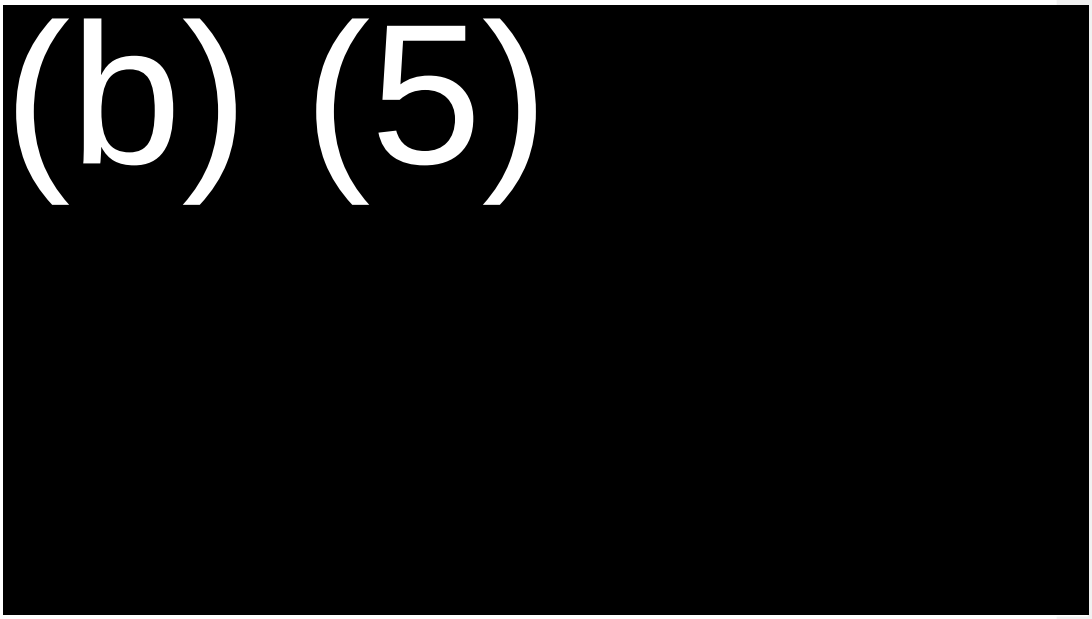

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From:	Tonkonogy, Bella
To:	"Bella Tonkonogy"
Subject:	FW: G20 questionnaire
Date:	Tuesday, September 18, 2012 6:28:00 PM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US.docx

Make sure you flag the 2020 comment.

From: Tonkonogy, Bella
Sent: Tuesday, September 18, 2012 6:27 PM
To: Metcalf, Gilbert; Urbanas, Elizabeth (Beth)
Cc: Jaffe, Judson; Hall, Daniel; Berg, Katie; Lien, Elizabeth; Demopulos, Abigail; Tonkonogy, Bella
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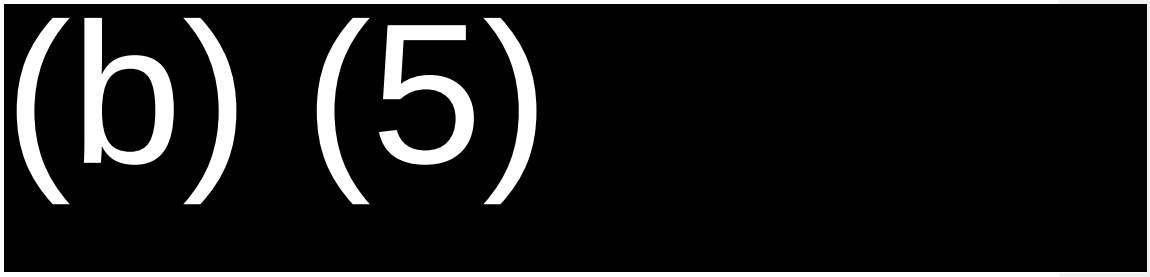

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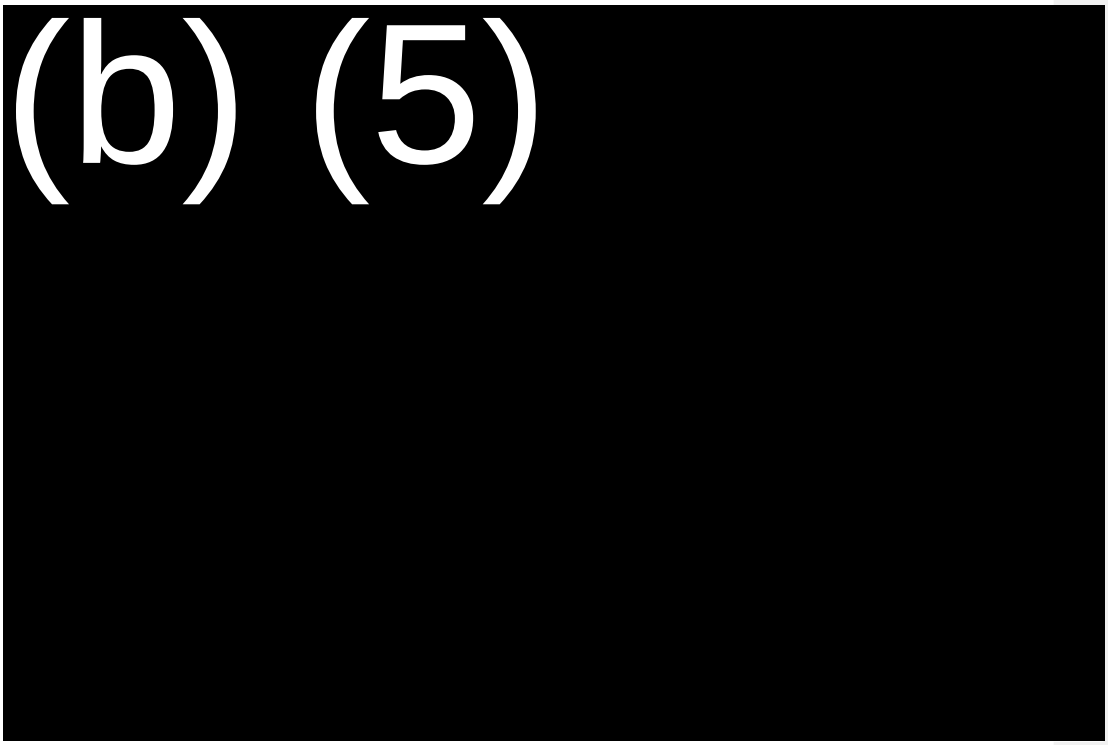

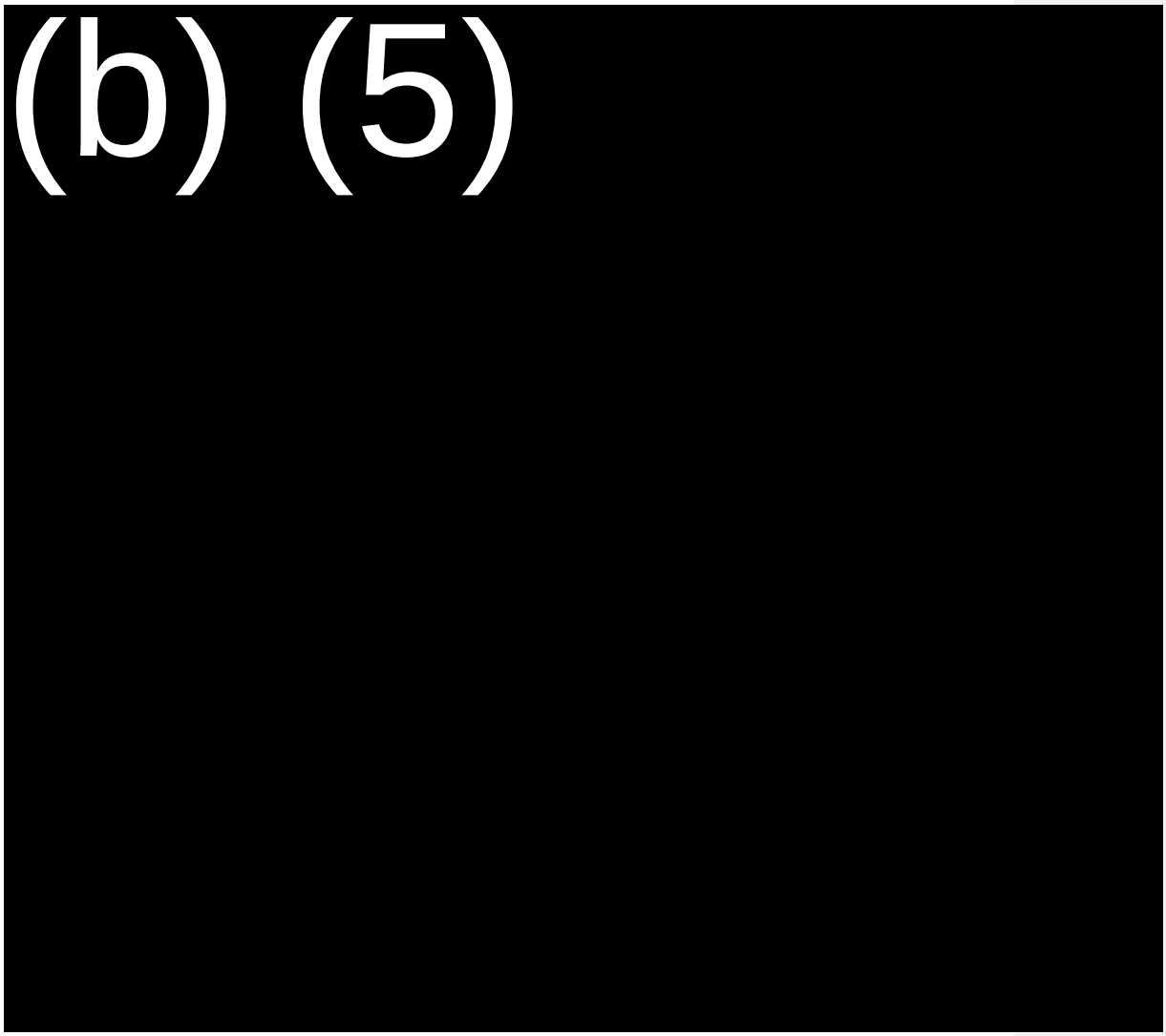

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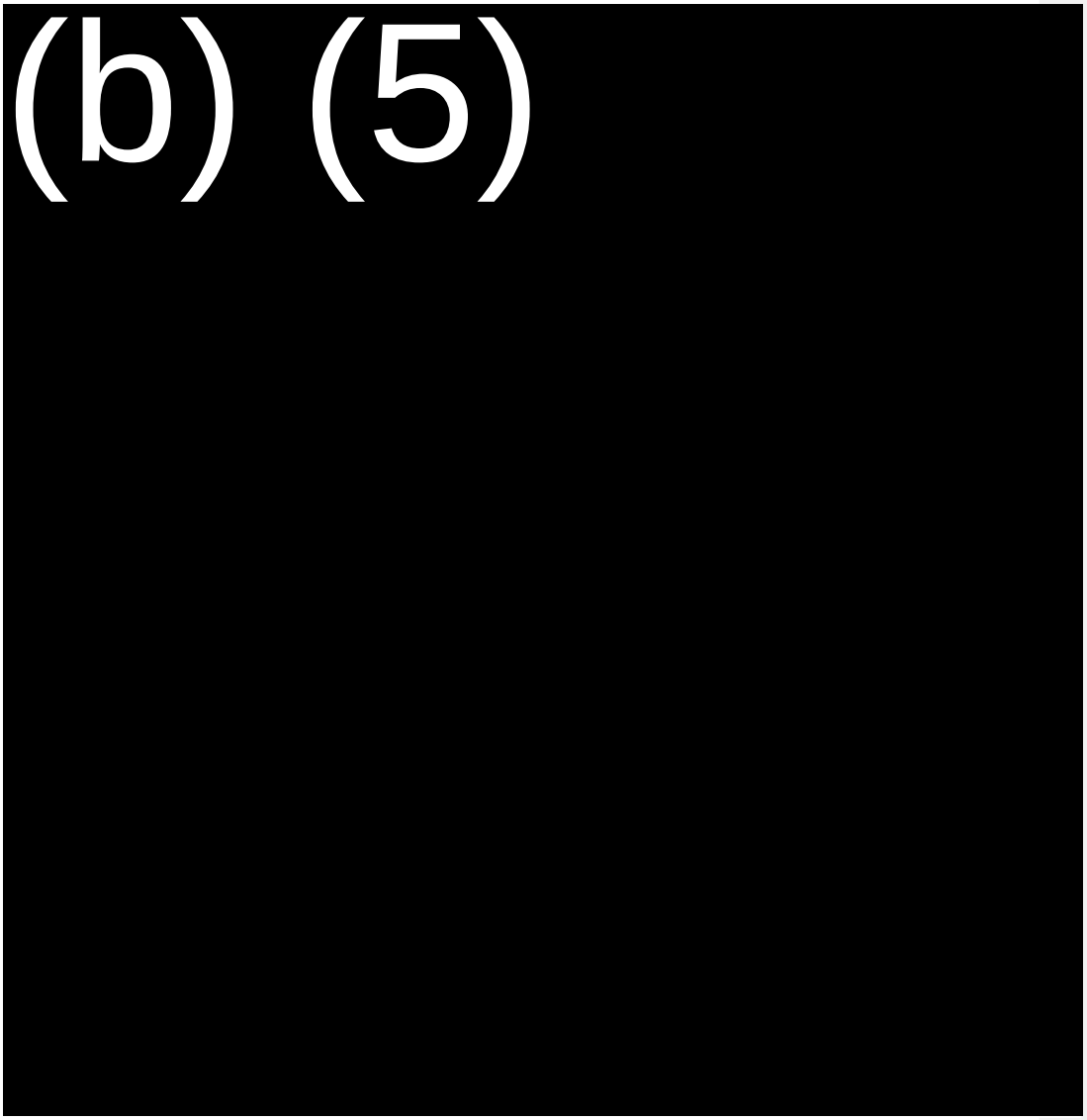

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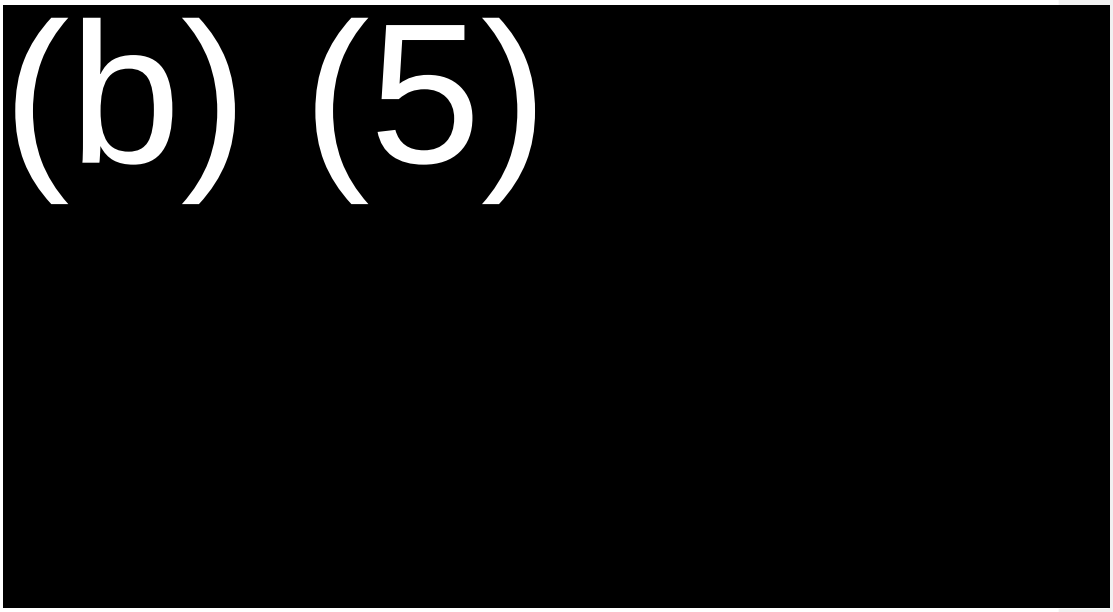

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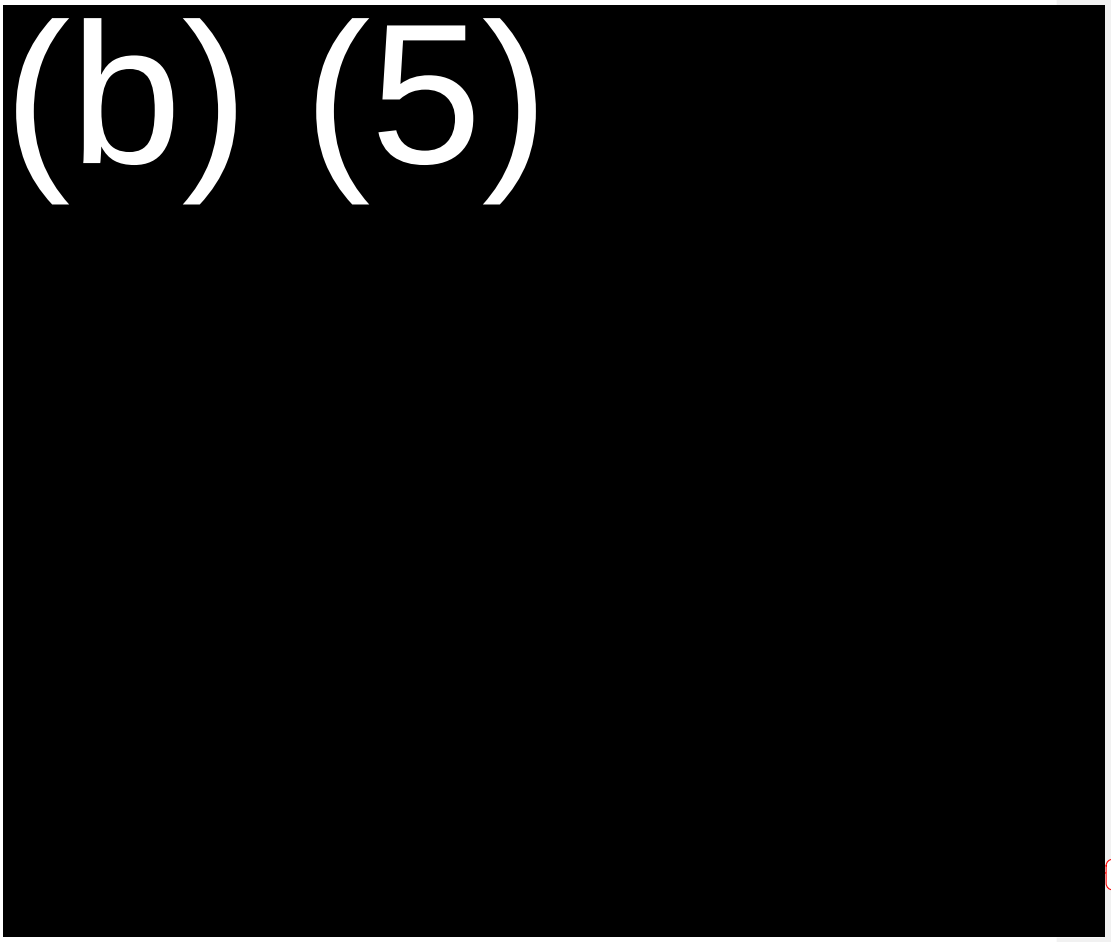

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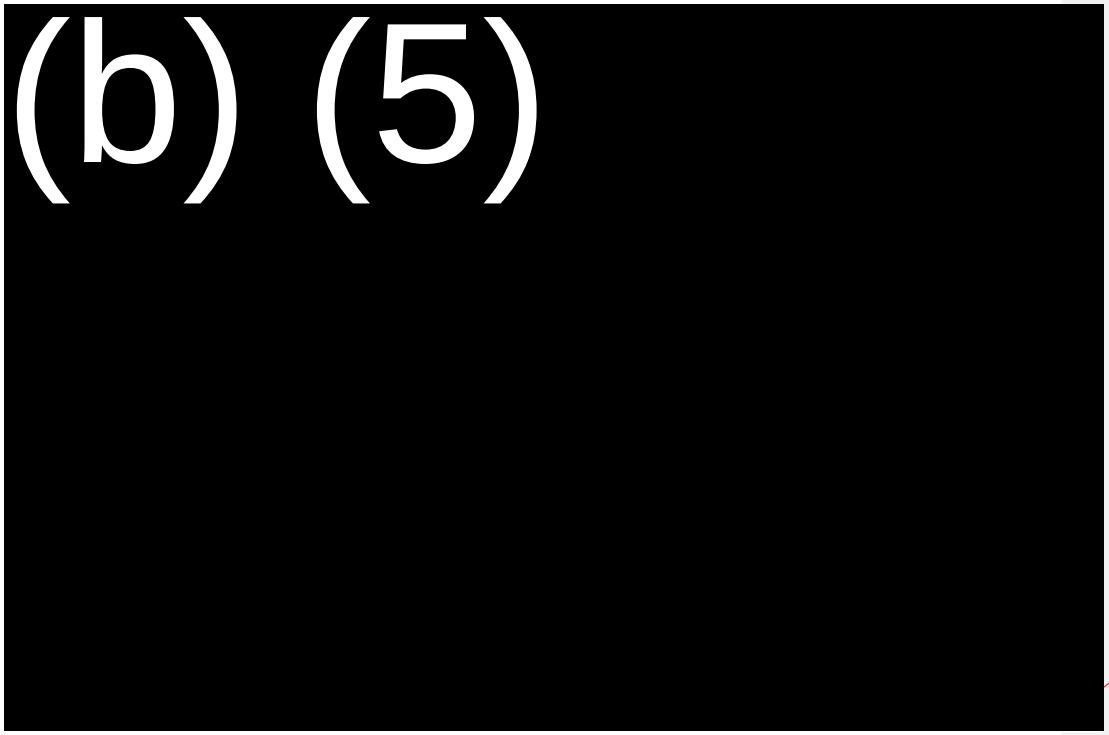

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From:	Tonkonogy, Bella
To:	Lien, Elizabeth
Subject:	adaptation and private sector
Date:	Wednesday, September 19, 2012 9:56:36 AM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US.docx

Do you want to add a sentence on adaptation and private sector to the G20 question on private sector? See attached for latest version.

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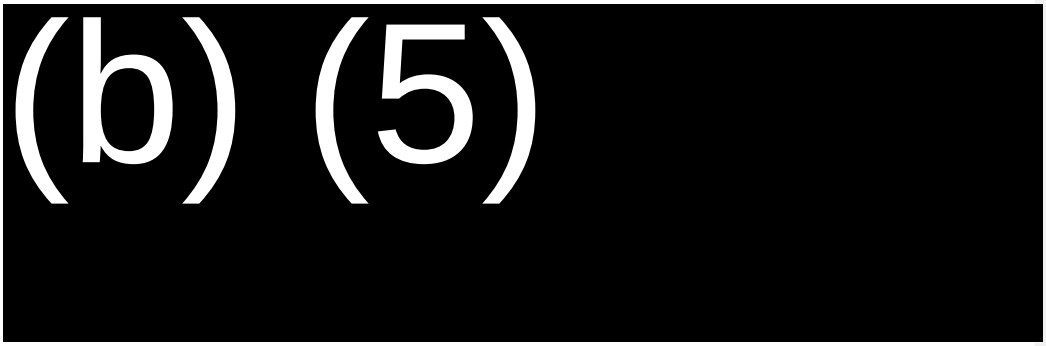

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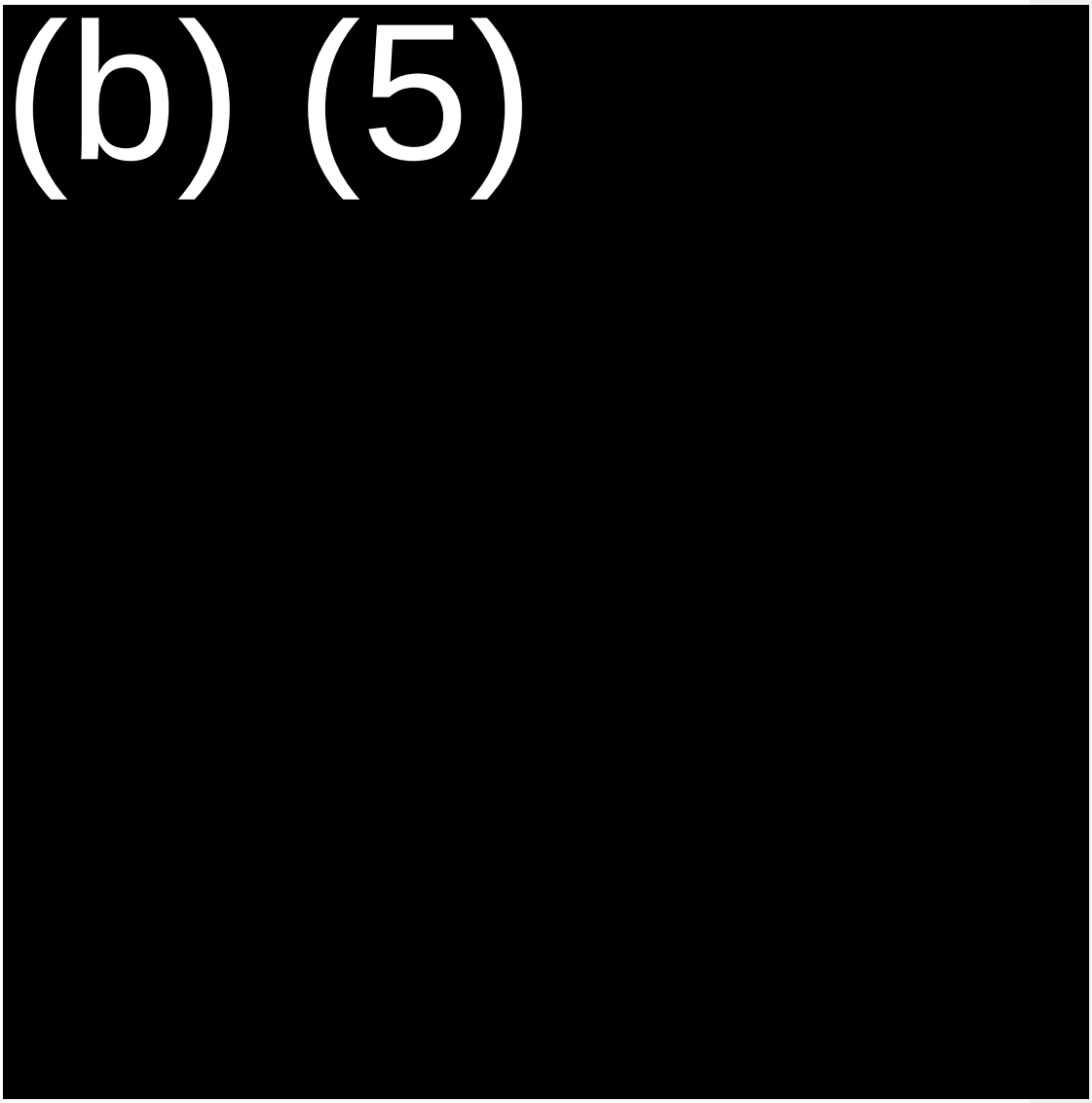

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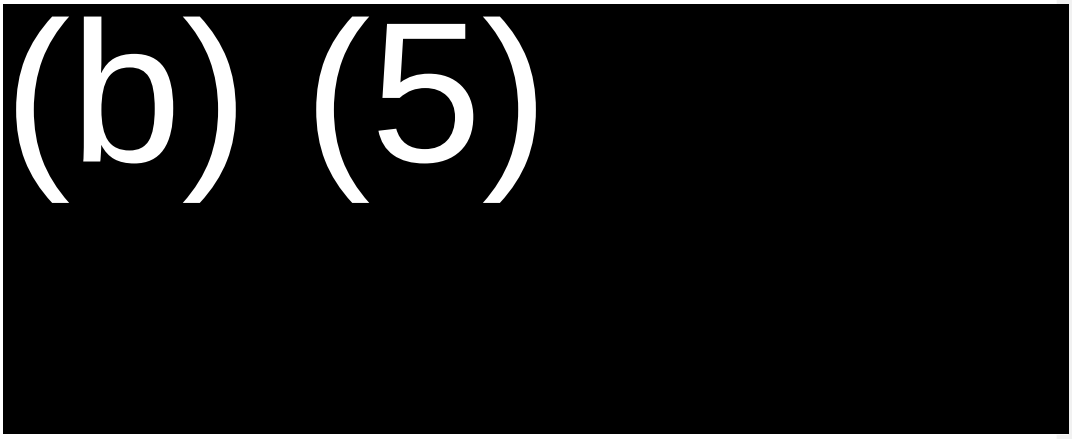

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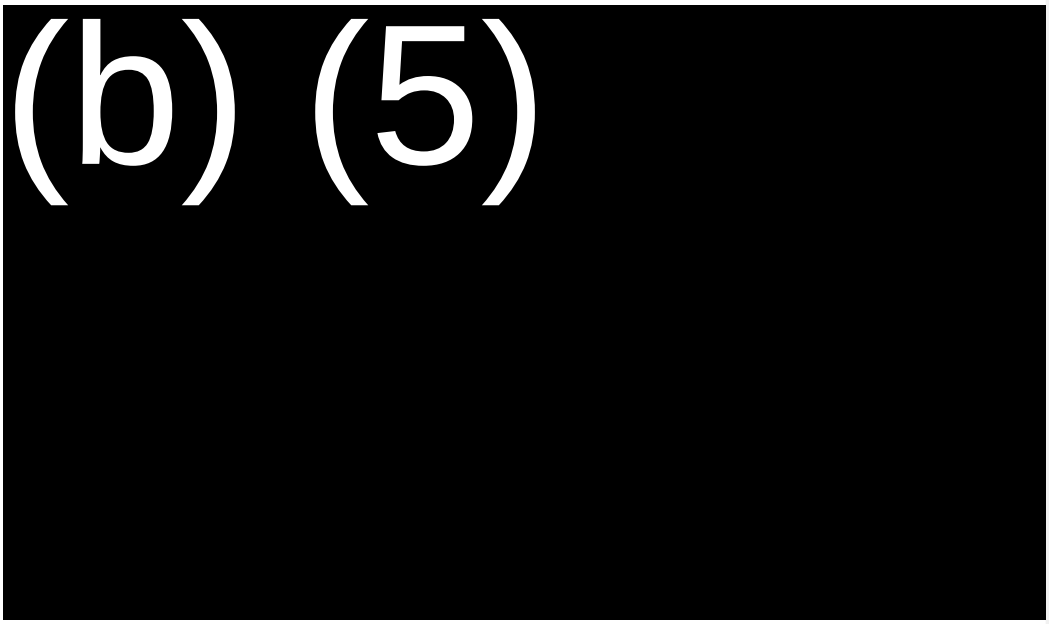

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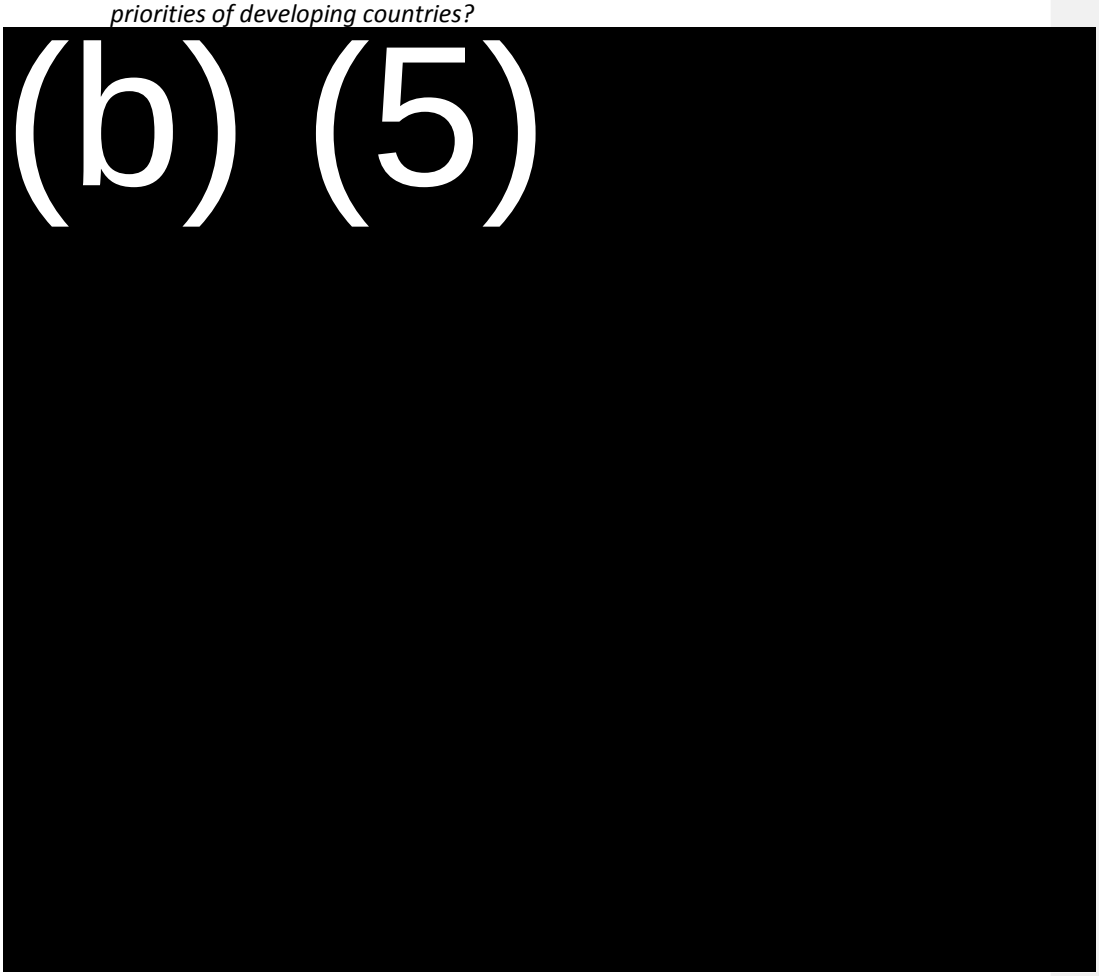

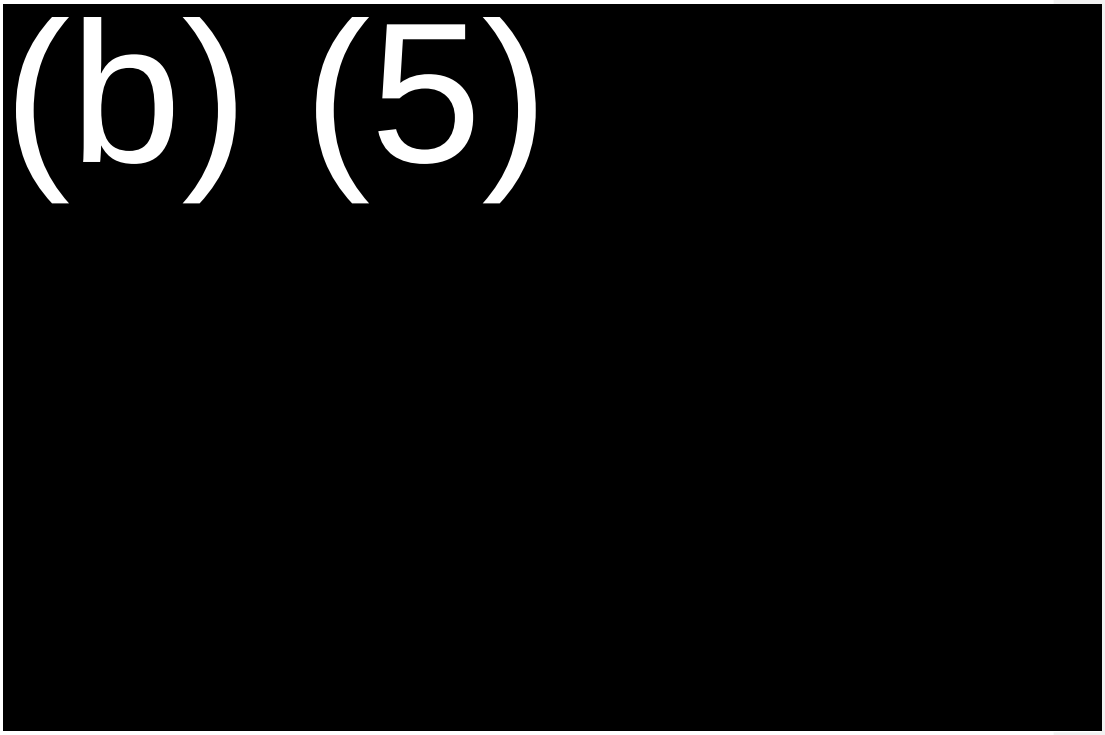

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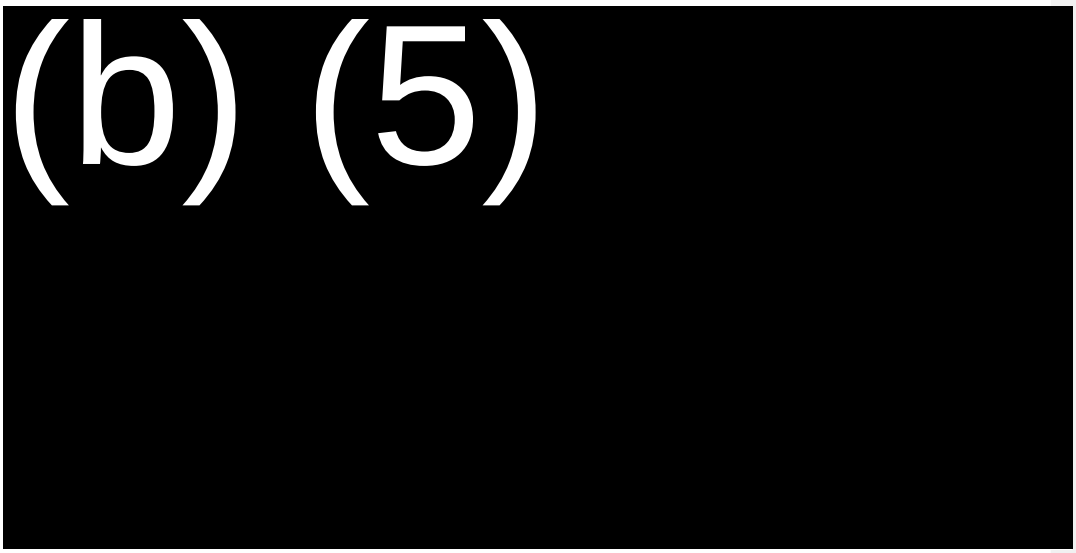

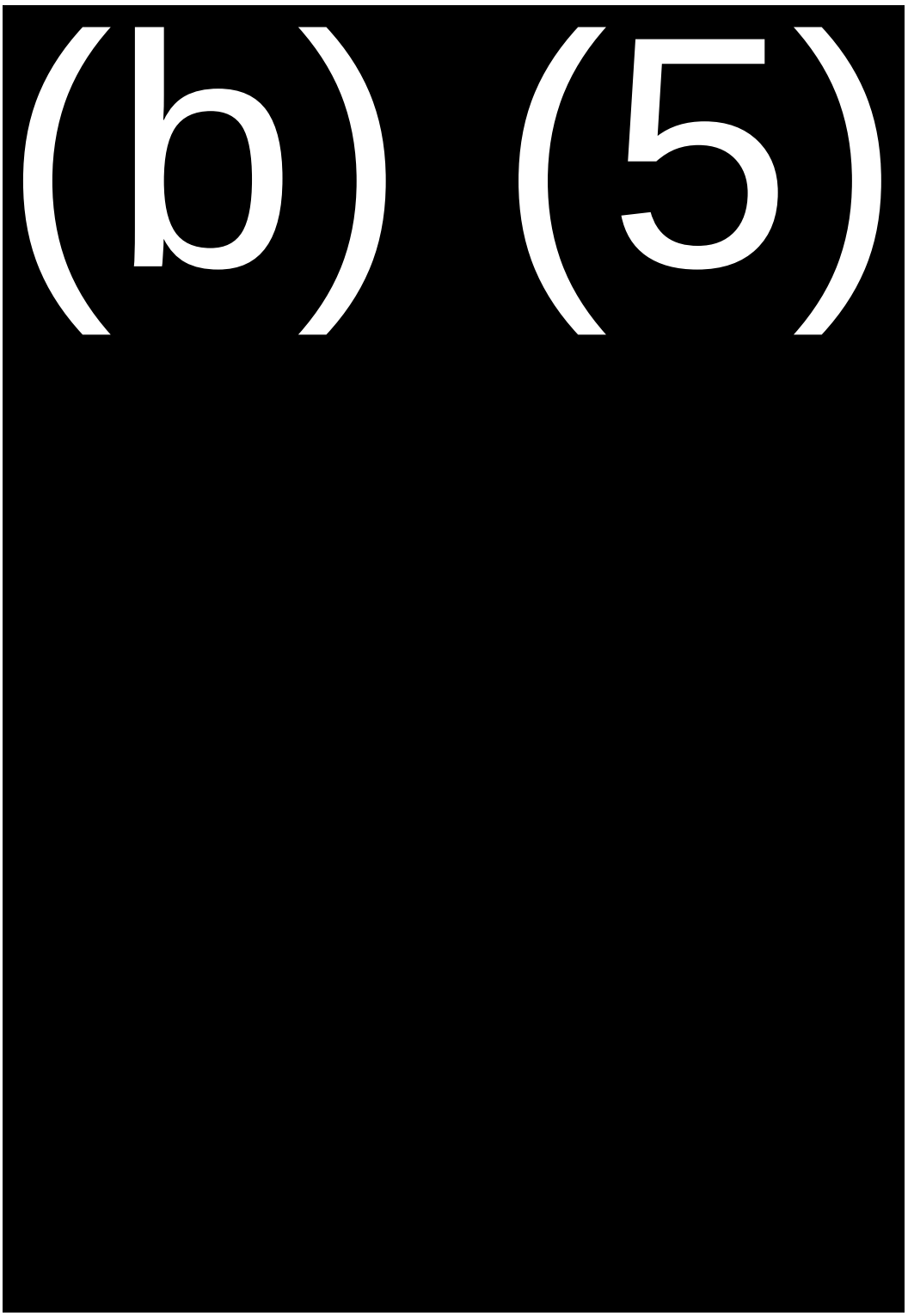
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From:	Metcalf, Gilbert
To:	(b) (6) @tufts.edu"
Subject:	Fw: G20 questionnaire
Date:	Wednesday, September 19, 2012 6:35:45 AM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US.docx

Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

From: Tonkonogy, Bella
Sent: Tuesday, September 18, 2012 06:26 PM
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U.S. Department of the Treasury
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bella.tonkonogy@treasury.gov

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

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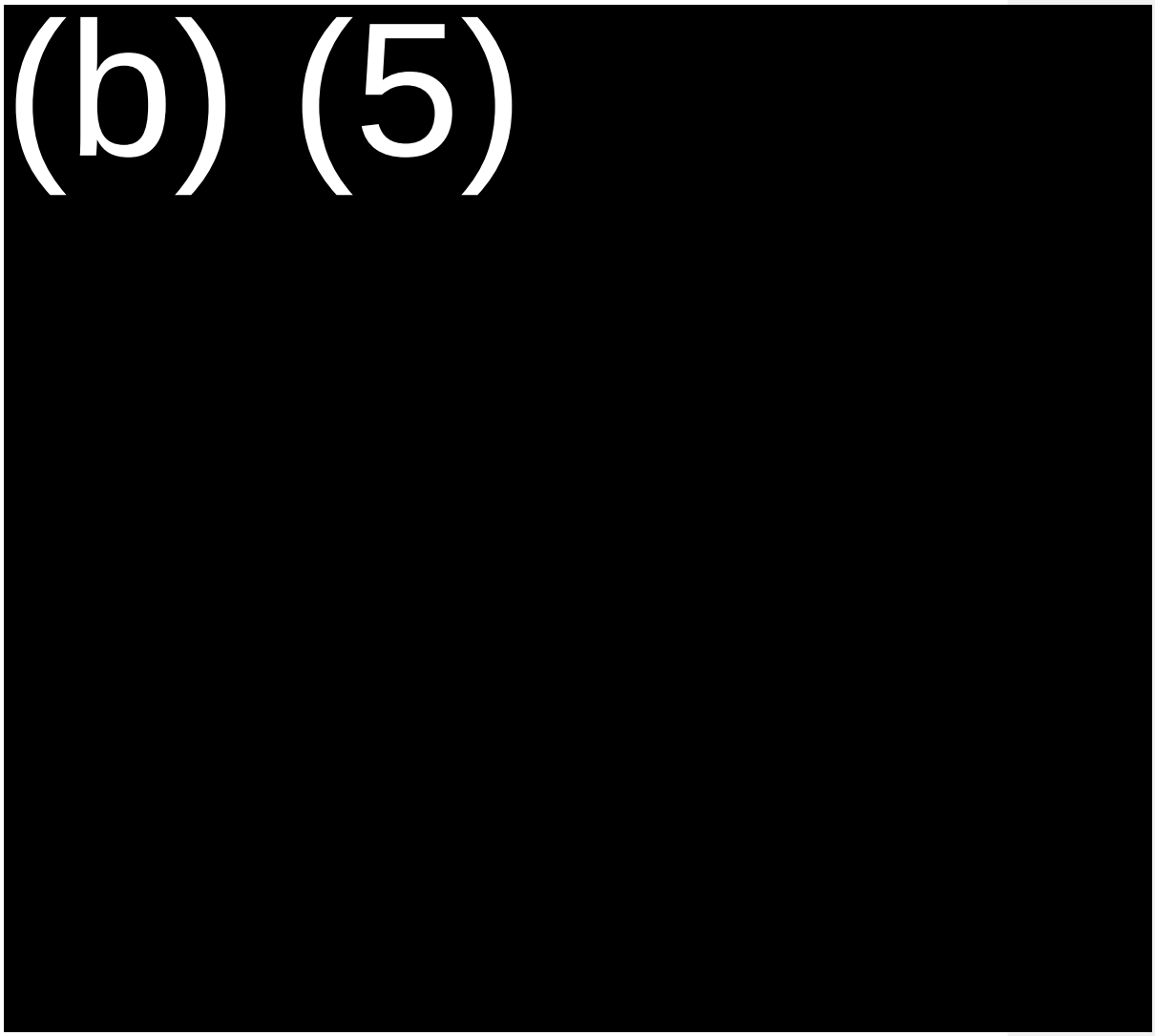

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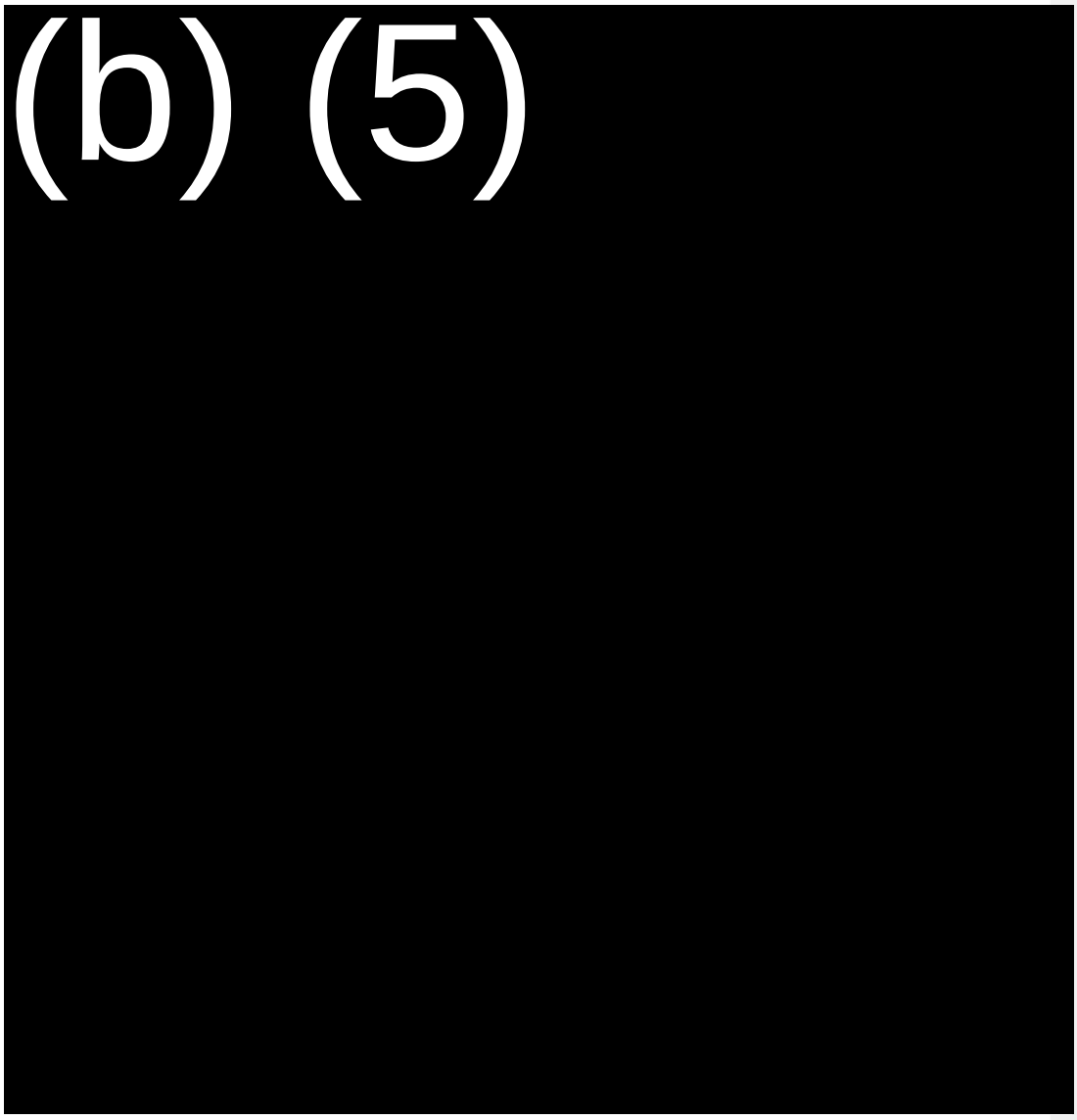

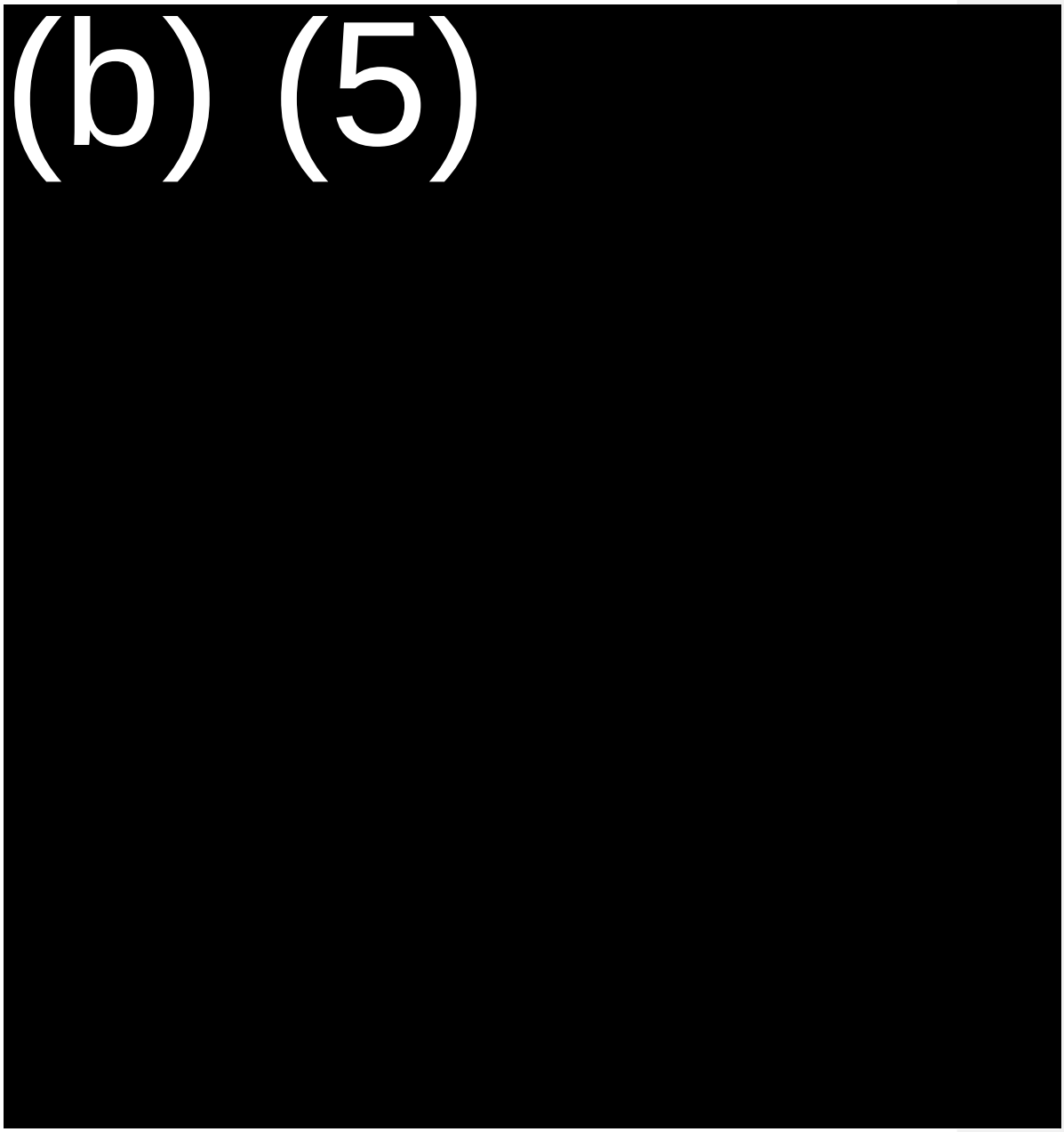

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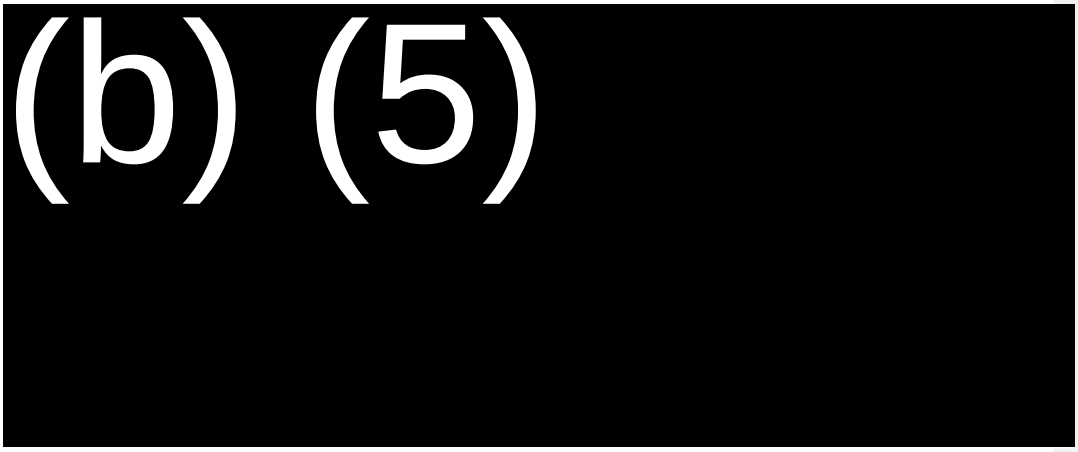

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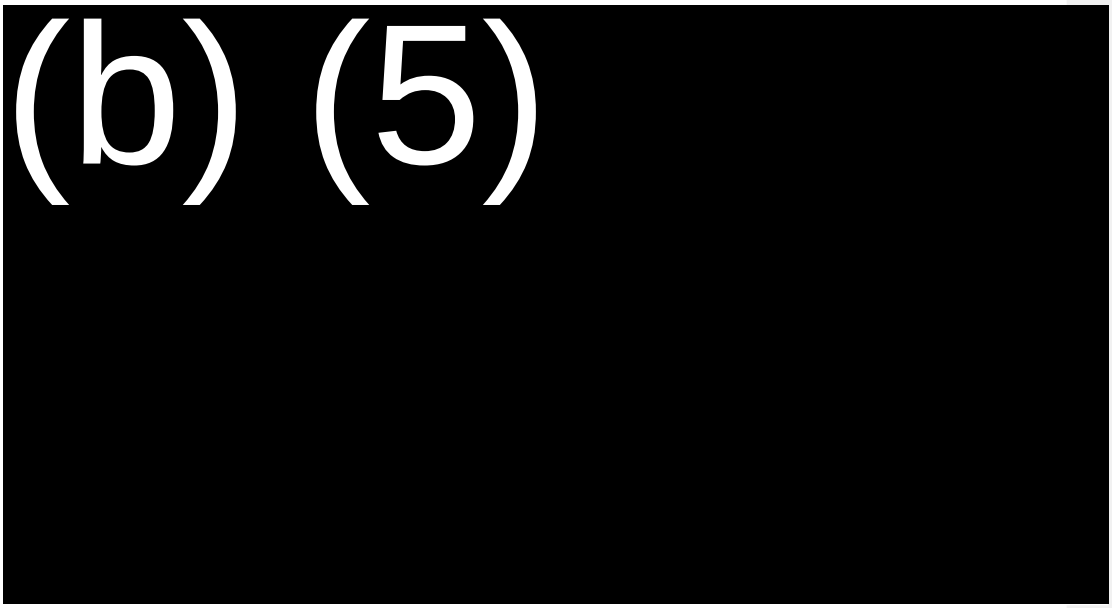

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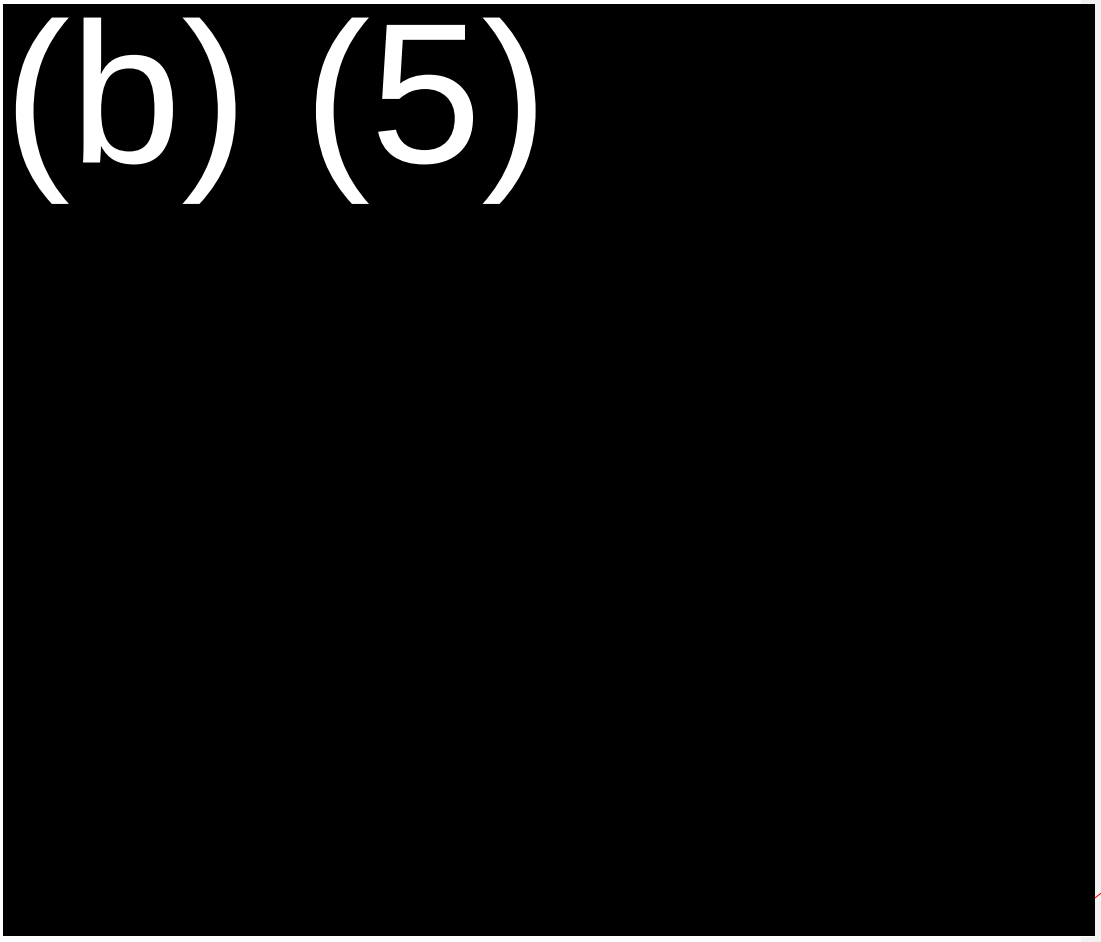

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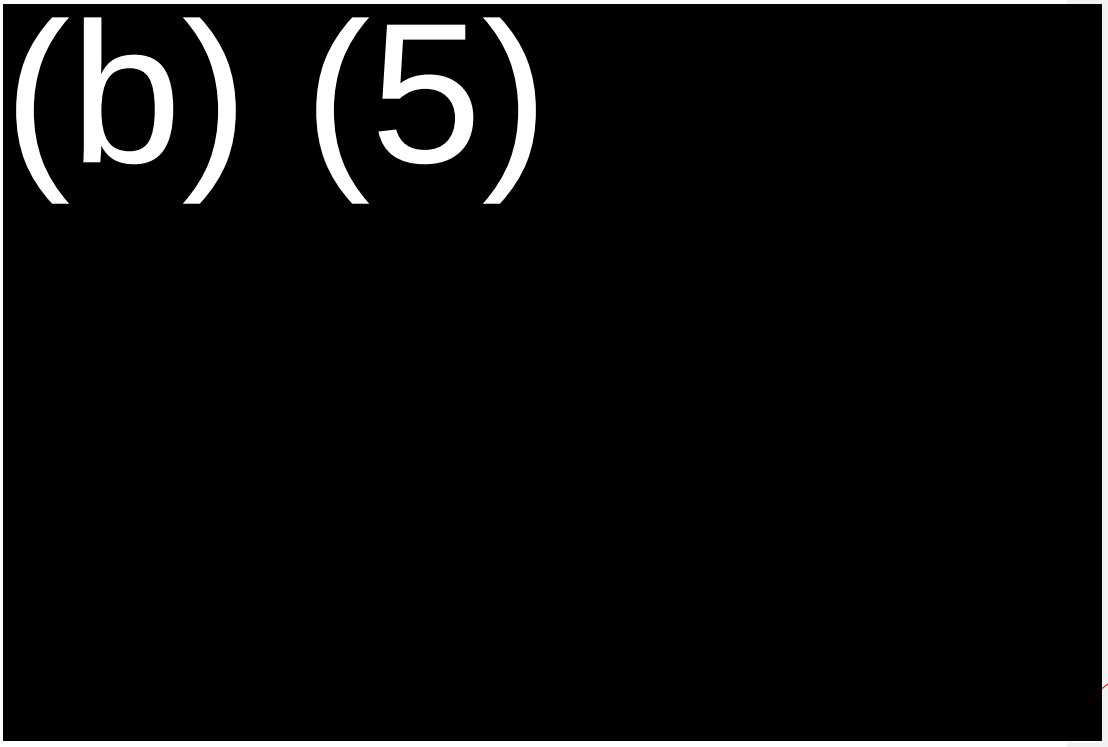

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From:	Metcalf, Gilbert
To:	Tonkonogy, Bella; Urbanas, Elizabeth (Beth)
Cc:	Jaffe, Judson; Hall, Daniel; Berg, Katie; Lien, Elizabeth; Demopulos, Abigail
Subject:	Re: G20 questionnaire
Date:	Wednesday, September 19, 2012 6:59:07 AM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US_gm_1.docx

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For Environment & Energy
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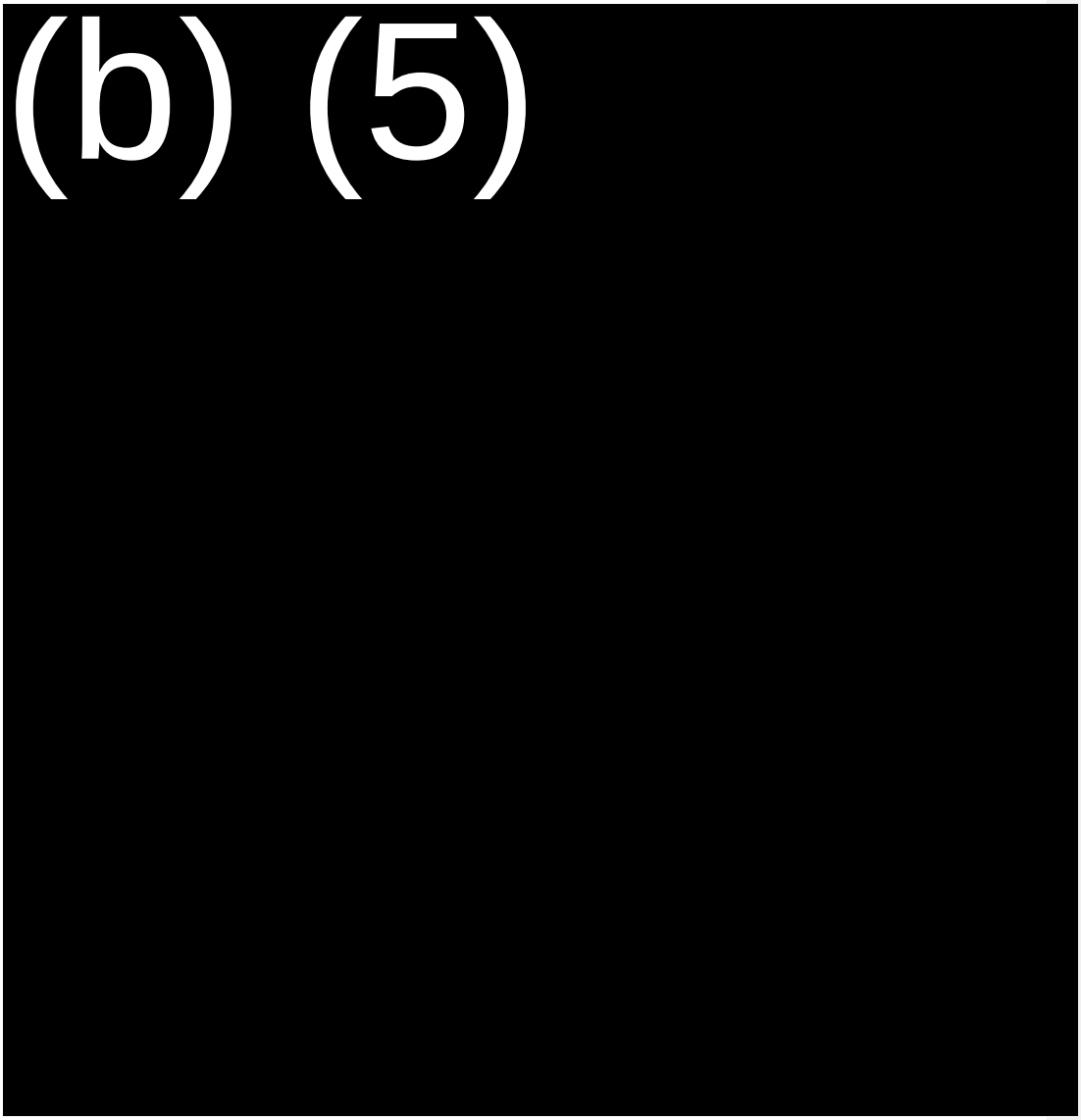

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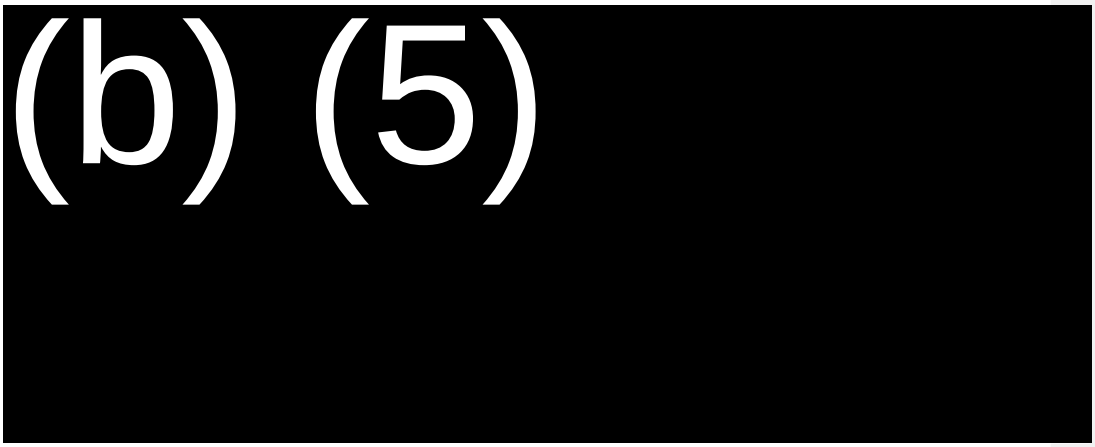

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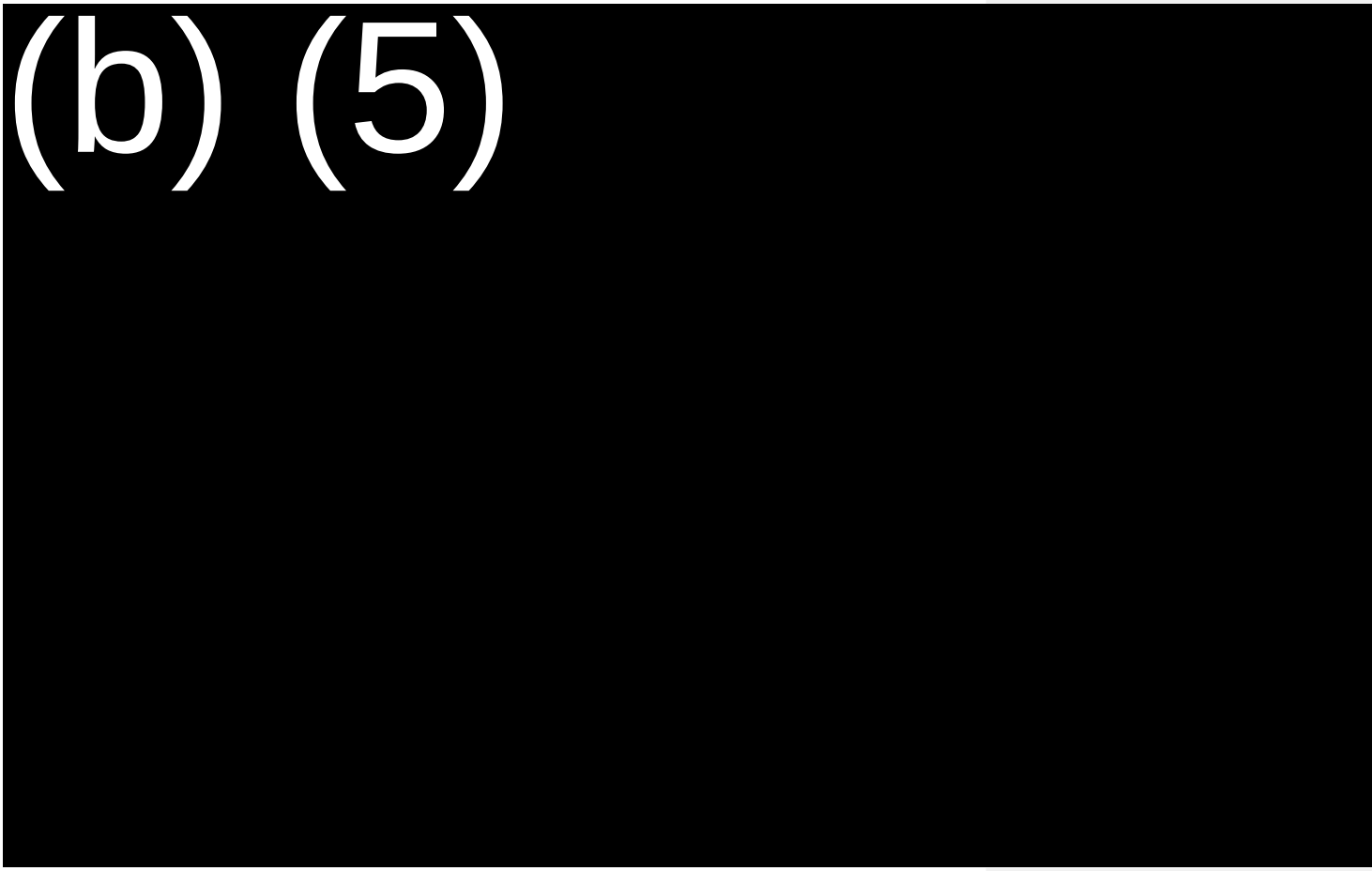

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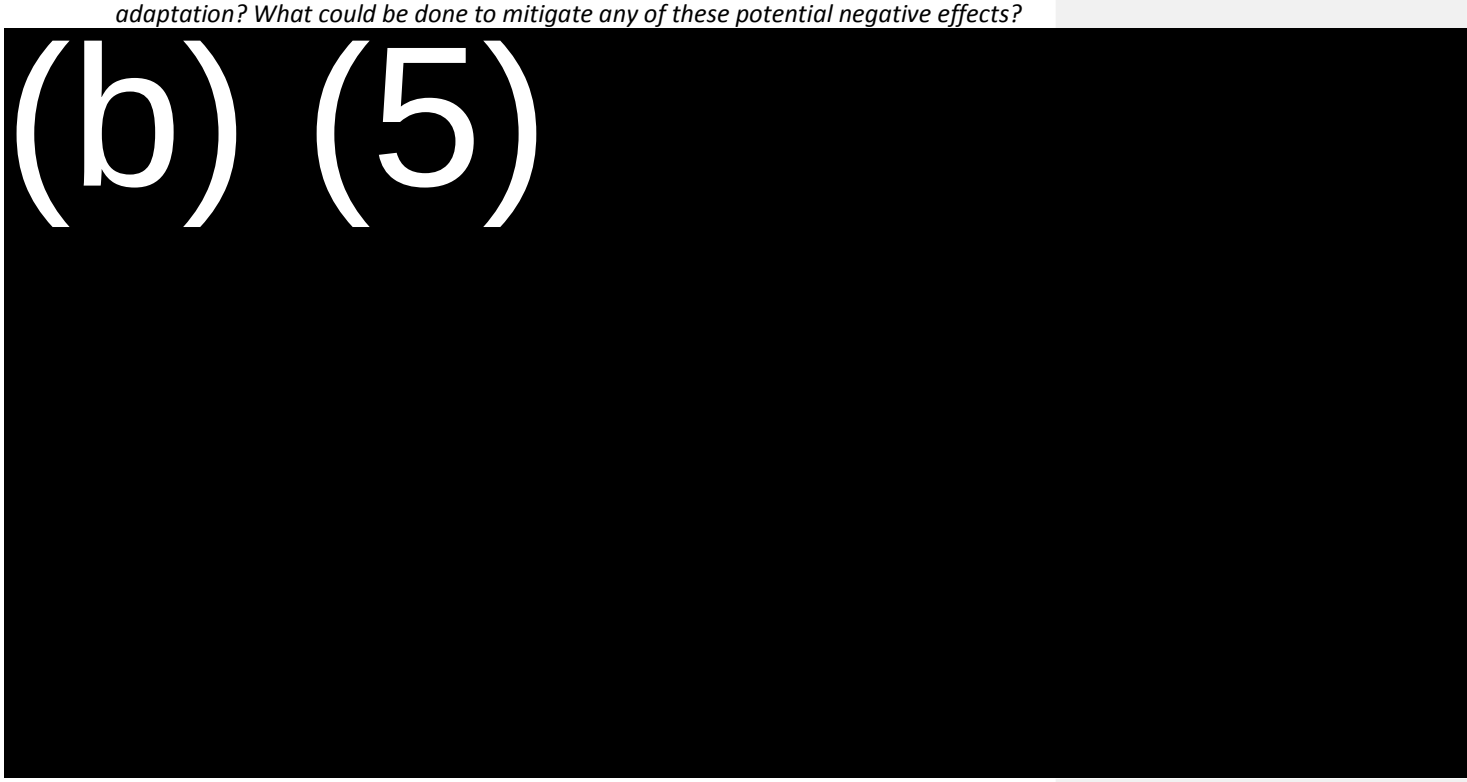

From: Tonkonogy, Bella
To: Tonkonogy, Bella
Subject: FW: G20 questionnaire
Date: Wednesday, September 19, 2012 7:58:49 AM
Attachments: G20 STUDY GROUP ON CLIMATE FINANCE_US.docx

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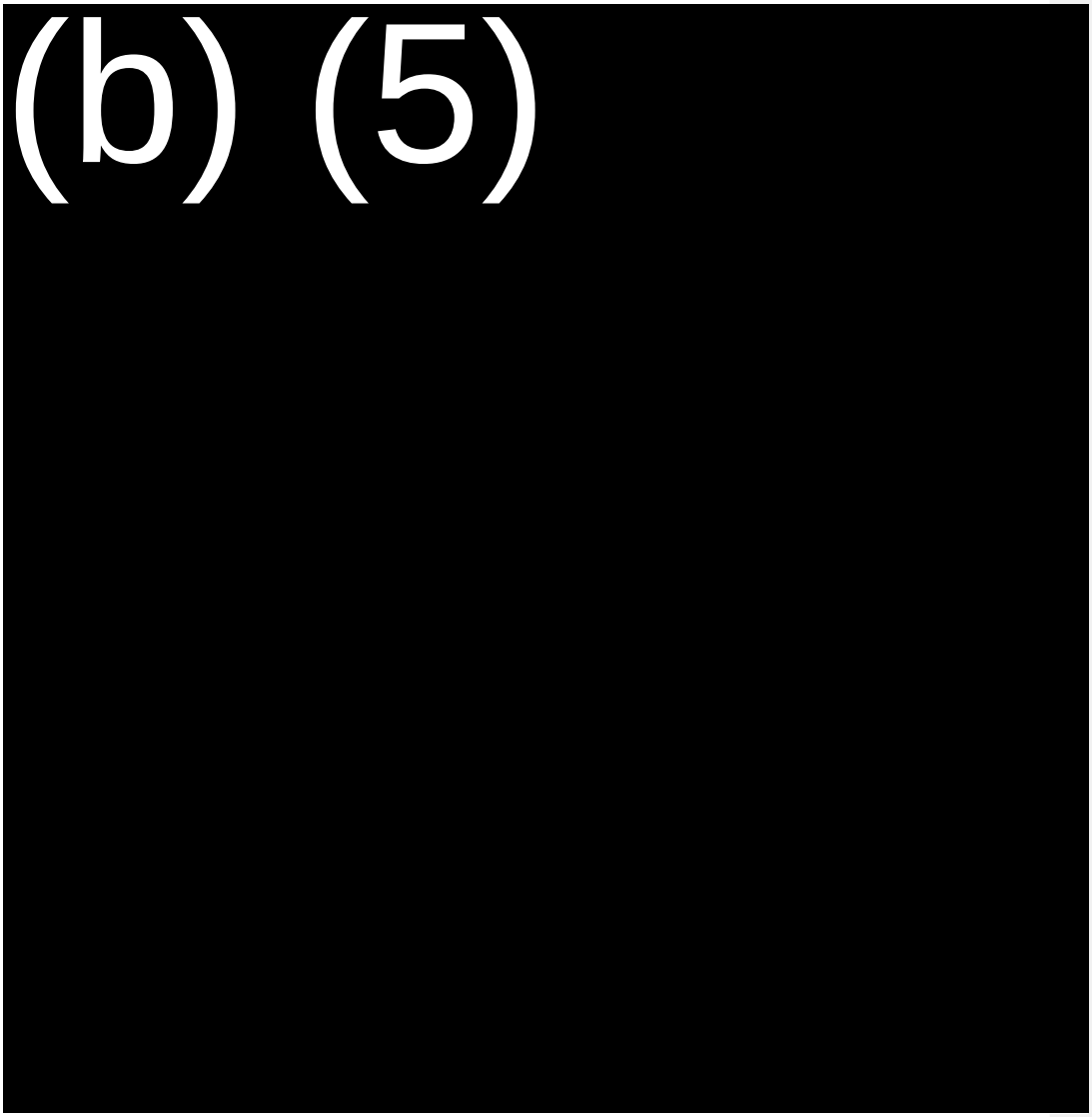

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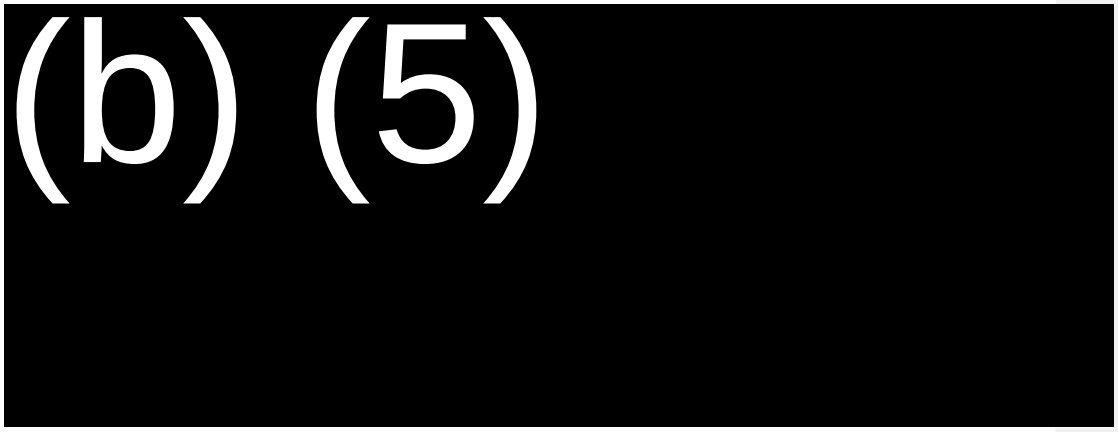

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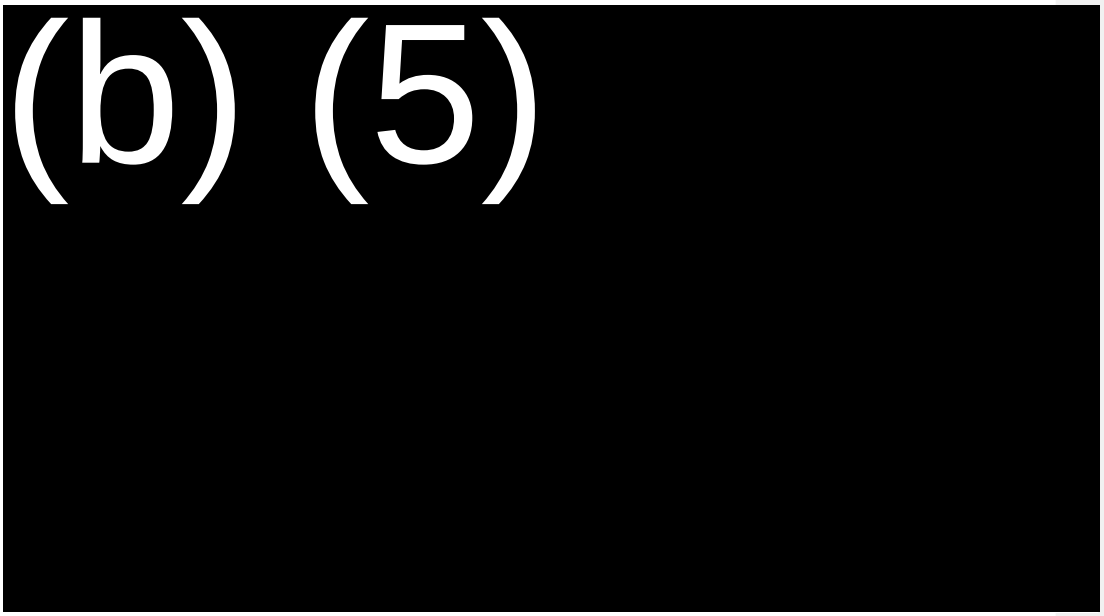

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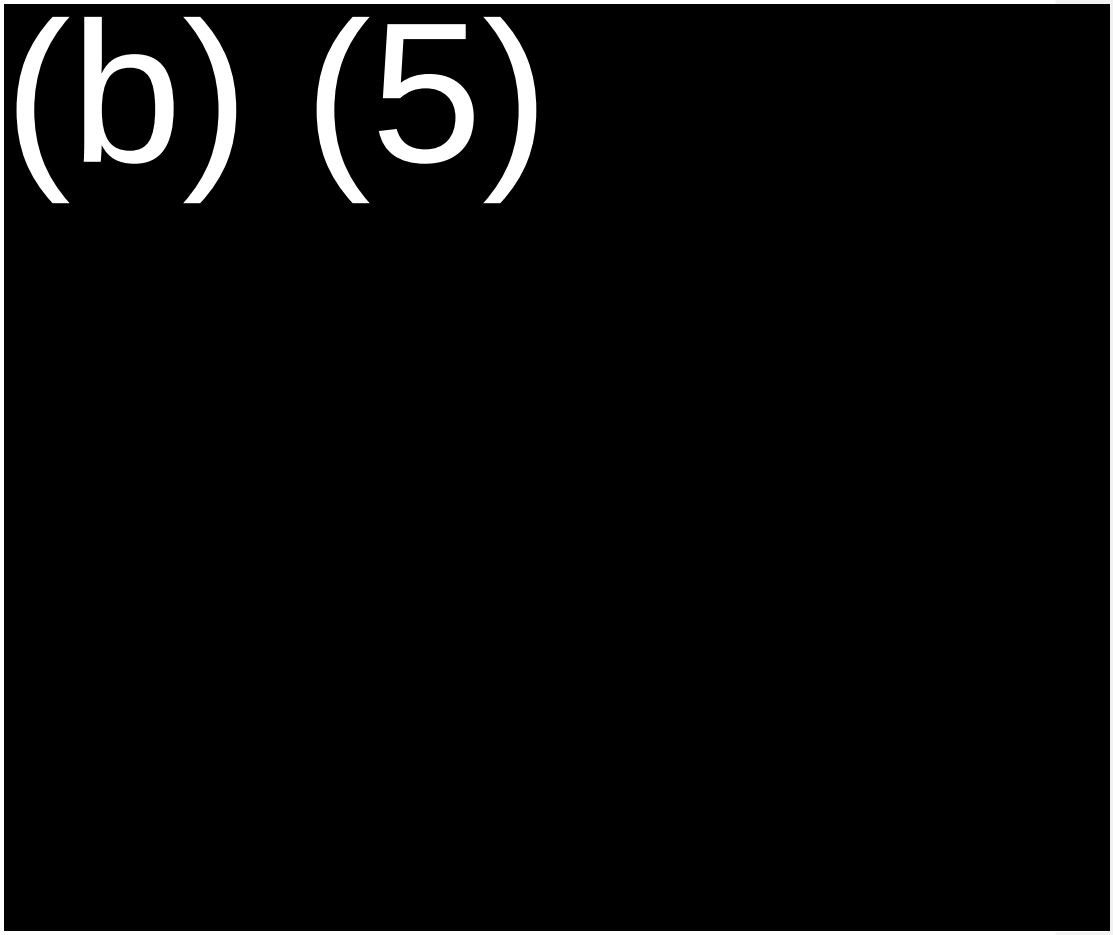

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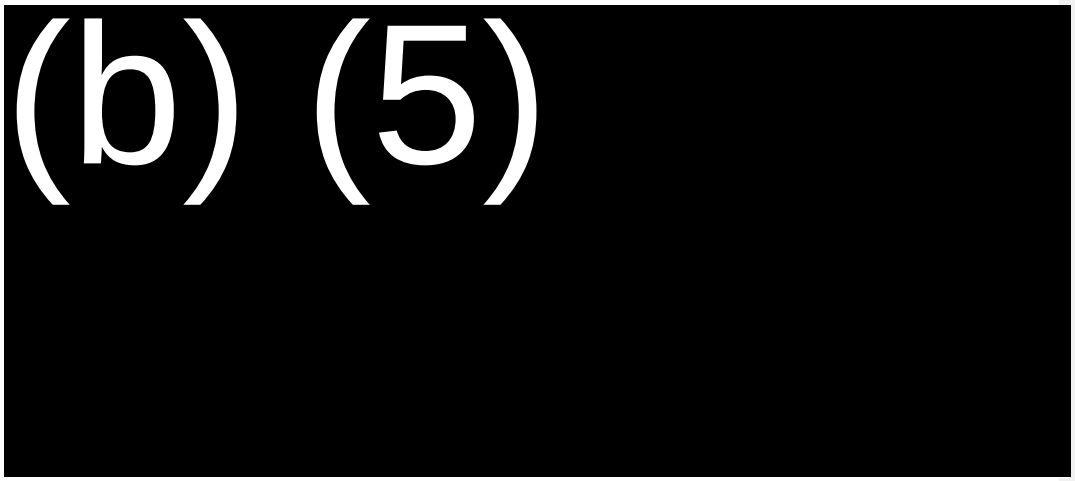

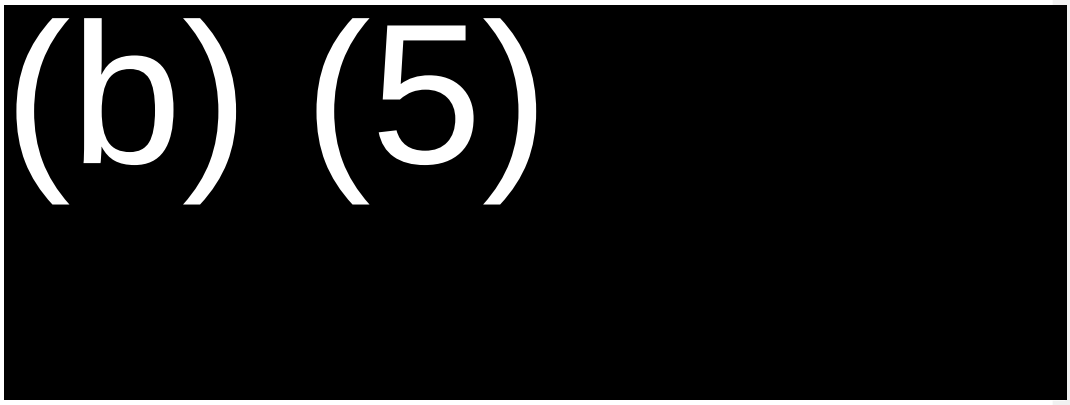
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From: Lien, Elizabeth
To: Tonkonogy, Bella
Subject: G20 STUDY GROUP ON CLIMATE FINANCE_US
Date: Wednesday, September 19, 2012 10:18:00 AM
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- *Do you consider that the variety of potential sources tackled by the IFI Report to the G20 could in principle bring sufficient revenues and predictable enough flows of finance to the fight against climate change and to reach in particular the goal of mobilizing $100bn a year?*
- *What other additional sources should the G20 also consider? For each of these sources, what measures would be required to mobilize them and what are the impediments, consequences and advantages of these measures? What could be the role of the G20 to move forward in this respect?*

(b) (5)

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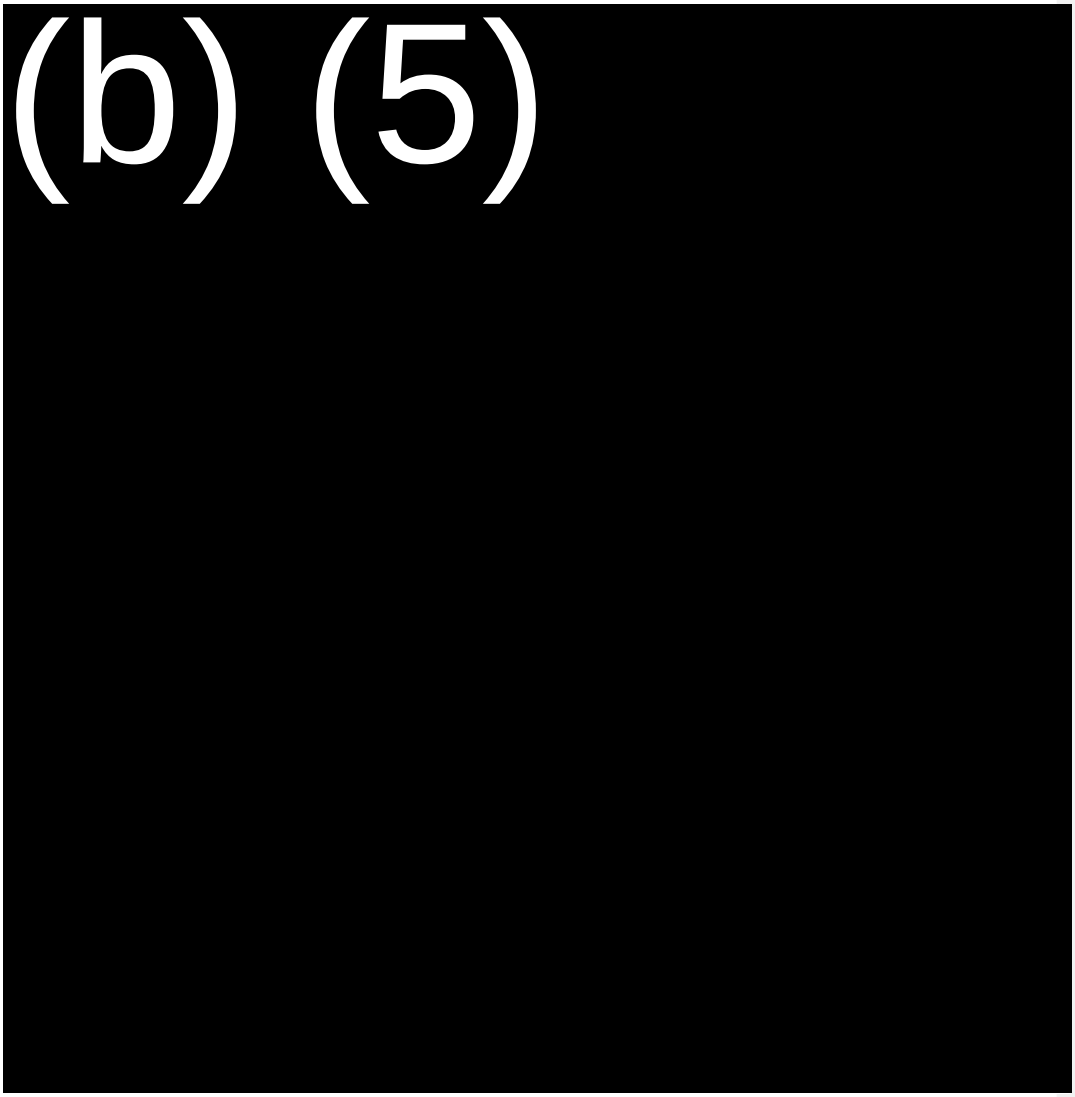
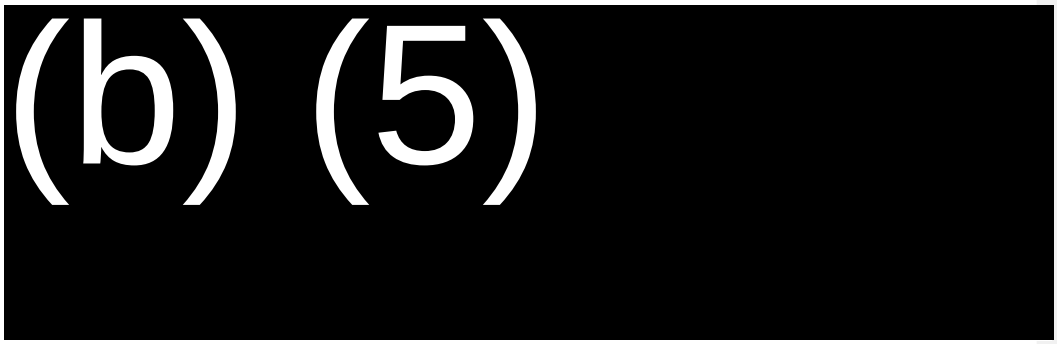
- *What could be in your view the role of the G20, if any, in terms of a shared approach to carbon pricing policies?*

(b) (5)



ISSUE 3: Charges to mitigate emissions in international aviation and maritime transportation



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G20 members have committed to "*rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption over the medium term while providing targeted support to the poorest*"[3]. Tracking progress towards this objective is work undertaken within the G20 Energy Working Group.

(b) (5)

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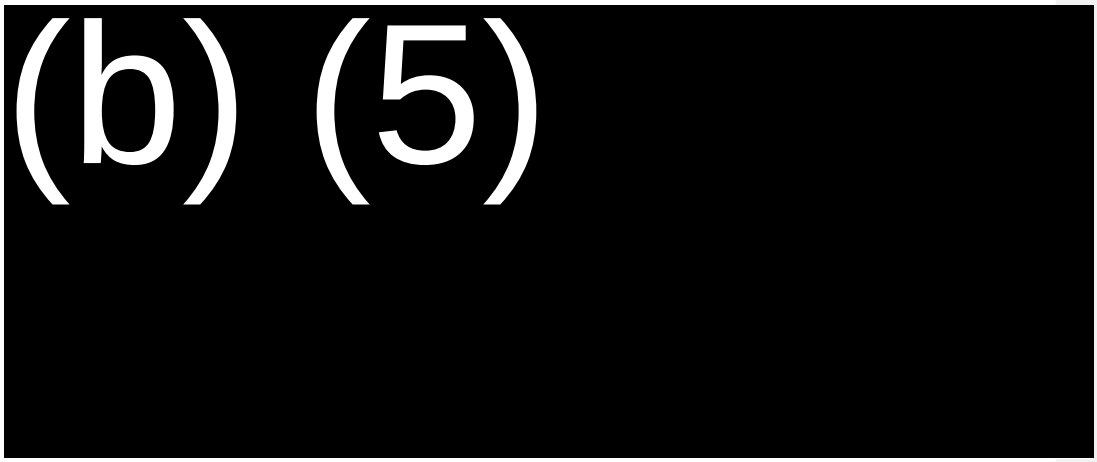

ISSUE 5: Carbon Markets

While the global institutional context is currently subject to uncertainties, carbon markets, including offsetting mechanisms such as the Clean Development Mechanism (CDM) are promising instruments.

- *Are carbon markets, including offsetting mechanisms, a promising way to mobilize private flows? What could be done to deal with the challenges and short term concerns such as the volatility and low price of carbon credits and what could be learnt from countries that have dealt with these challenges?*
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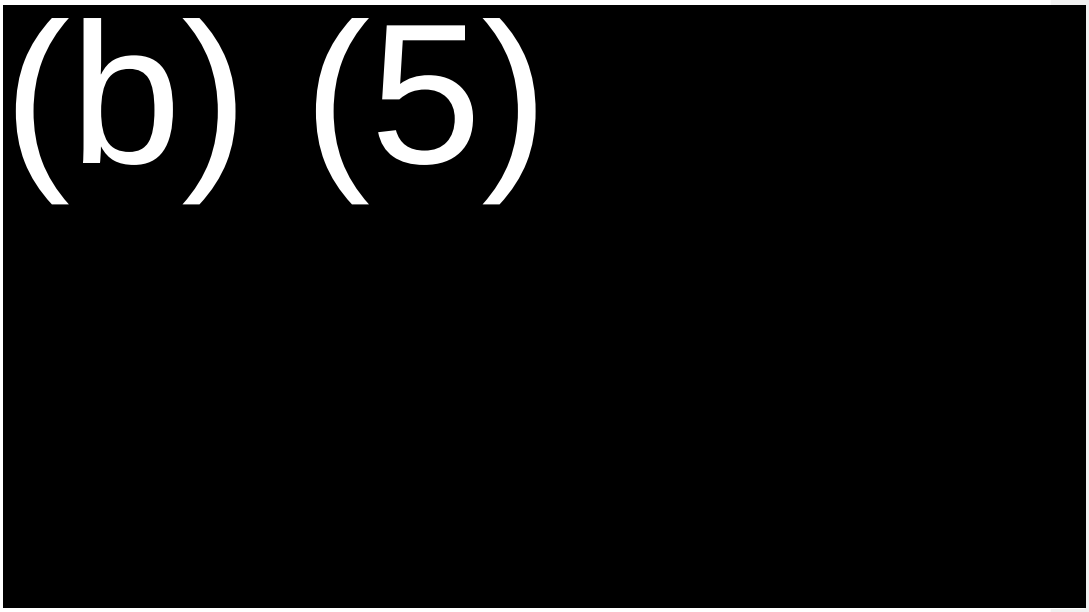

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- *What are the crucial elements of an incentive framework needed to catalyze high levels of climate-related investments, including from private finance??*
- *What role could direct budget contributions play in that regard?*
- *How should countries that have made commitments to additional public financing cooperate to leverage most effectively private sector investment?*
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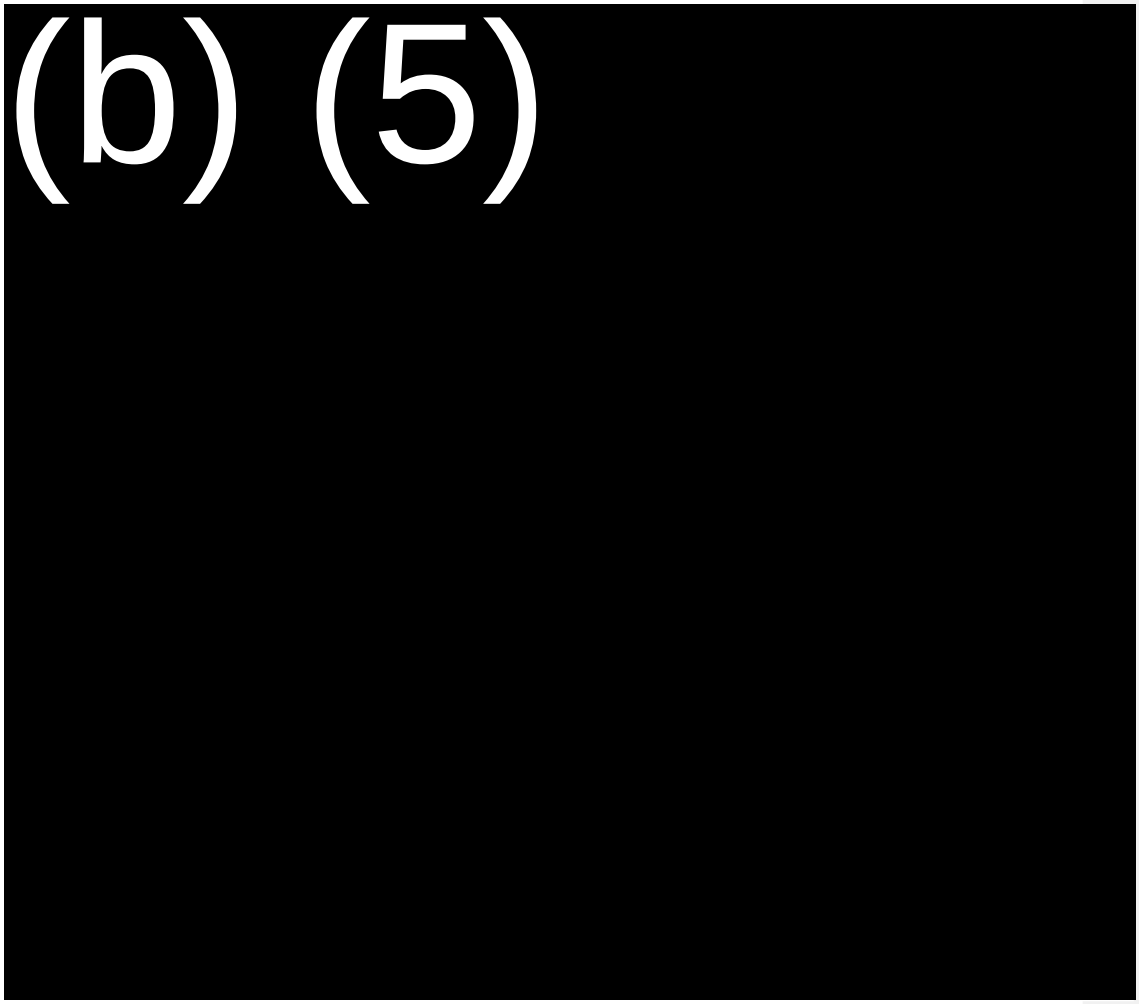

ISSUE 7: MDB resources

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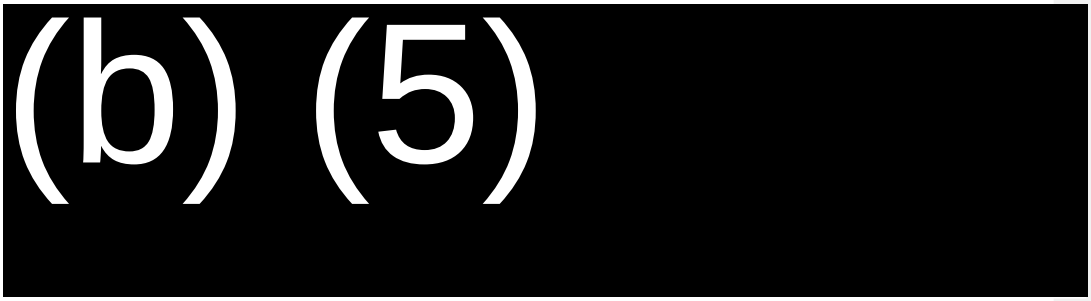
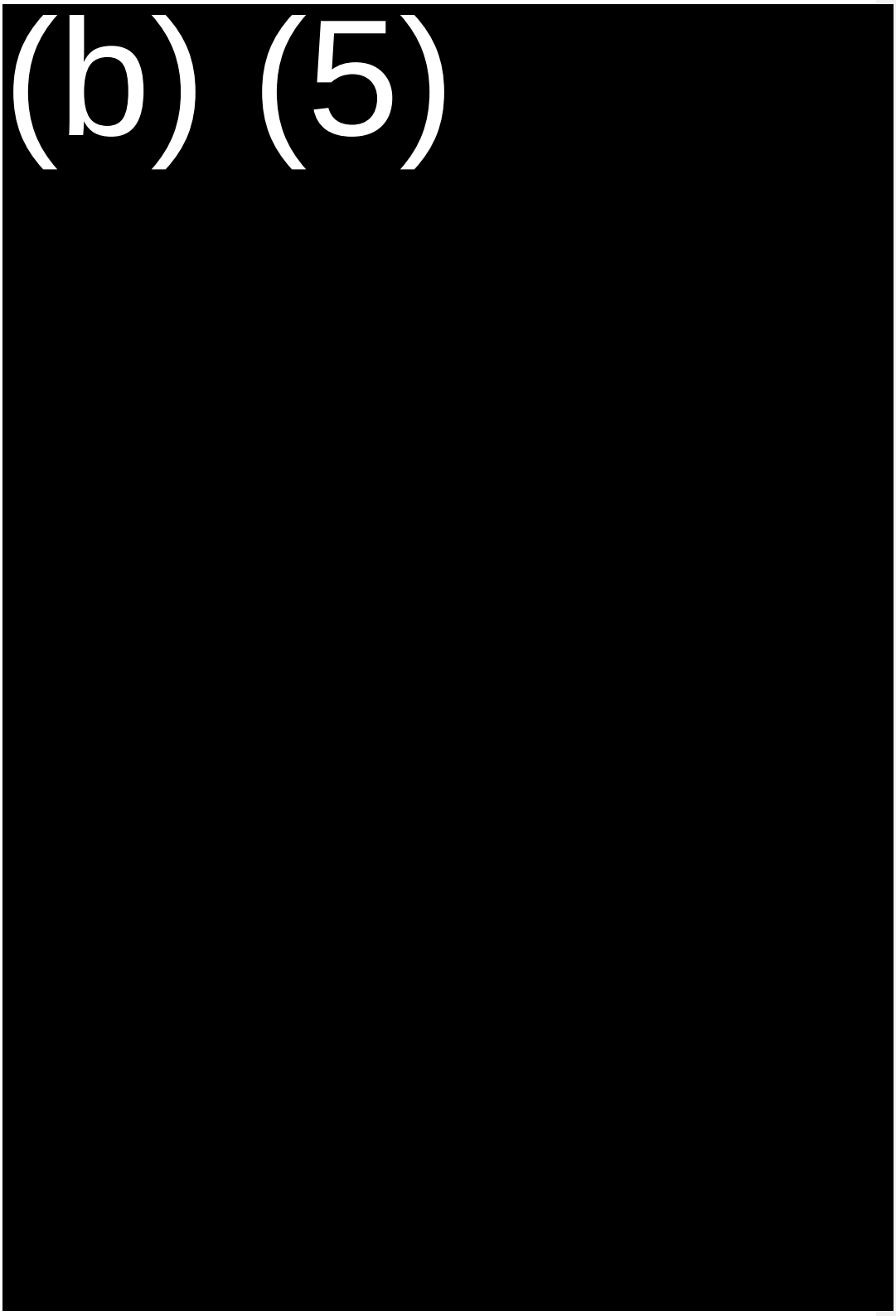
- *What role could MDB resources play with respect to climate finance?*
- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*




(b) (5)

From:	Tonkonogy, Bella
To:	McKeehan, Robert
Cc:	Das, Himamauli; Metcalf, Gilbert; Urbanas, Elizabeth (Beth)
Subject:	FW: G20 climate finance questionnaire- responses for interagency review
Date:	Wednesday, September 19, 2012 11:11:00 AM
Attachments:	CFSG TOR FINAL.DOCX G20 STUDY GROUP ON CLIMATE FINANCE_US.docx

Rob-

Attached for your review please find draft responses to a questionnaire for the G20 Study Group on Climate Finance. Our responses have been reviewed interagency and cleared by Gib, and we are hoping you can take a glance at it today so we can submit to the Study Group Co-Chairs (France and South Africa) prior to a face to face meeting of the Study Group in Mexico over the weekend.

Below you will find more background on this working group and questionnaire. Please let me know if you have additional questions.

Thanks,
Bella

From: Tonkonogy, Bella
Sent: Friday, September 14, 2012 4:48 PM
To: Demopulos, Abigail; Dennis, Benjamin; Carlson, Curtis; 'Carnahan, Kimberly C'; 'Maurice LeFranc'; 'Kelly, Alexia C'; 'Bodnar, Paul'; 'Brown, Jessica S'; 'carl.burleson@faa.gov'; Heil, Mark; Soares, Chris; 'Muehling.Brian@epamail.epa.gov'; 'Wayne.M.Lundy@uscg.mil'
Cc: Berg, Katie; Jaffe, Judson; Hall, Daniel; Lien, Elizabeth; Urbanas, Elizabeth (Beth)
Subject: G20 climate finance questionnaire- responses for interagency review

Dear Colleagues-

Please find attached draft questionnaire responses for the G20 Study Group on Climate Finance for your comment and clearance by **noon on Tuesday, September 18.**

The Issues covered in the questionnaire are the following:
Issue 1: Potential of sources identified and other sources to consider
Issue 2: Carbon Pricing Instruments
Issue 3: Charges to mitigate emissions in international aviation and maritime transportation
Issue 4: Fossil Fuel Subsidy Reforms
Issue 5: Carbon Markets
Issue 6: Direct Budget Transfers and Instruments to engage private finance
Issue 7: MDB Resources

Background:
At the G20 Los Cabos Summit in June, Leaders welcomed the creation of a G20 Study Group on Climate Finance, "in order to consider ways to effectively mobilize resources." In response to this mandate, co-chairs France and South Africa, with support from Mexico, have developed a questionnaire for study group members (all G20 countries) to complete on mobilizing climate finance. This questionnaire is a follow on from a report prepared last year for the G20 by the World Bank, OECD, and the Regional Development Banks on "Mobilizing Climate Finance." The sources of finance described in that report include,

among others, carbon markets, bunker fuel levies, private sector, etc.

Ultimately, the questionnaire responses and a face to face meeting on September 23 in Mexico will feed into a progress report to be presented by the study group to Ministers in November. The attached TOR provides more details on the mandate of this group and its tasks if you would like more background.

The responses are due to the Co-chairs on September 19 so thank you in advance for your quick turnaround.

Please let me know if you have questions.

Best regards,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

G20 STUDY GROUP ON CLIMATE FINANCE
TERMS OF REFERENCE

5 September 2012

MANDATE (see also Annexure)

- *13. We will continue to work on climate finance with the establishment of a G20 study group to consider ways to effectively mobilize resources and support the operationalization process of the Green Climate Fund taking into account the objectives, provisions and principles of the UNFCCC. [**G20 Finance Ministers and Central Bank Governors, Washington DC, April 2012**]*

- *71. … We welcome the creation of the G20 study group on climate finance, in order to consider ways to effectively mobilize resources taking into account the objectives, provisions and principles of the UNFCCC in line with the Cancun Agreement and ask to provide a progress report to Finance Ministers in November". [**G20 Leaders Declaration, Los Cabos, June 2012**]*

PURPOSE

G20 Heads of State have identified the need for stronger engagement and cooperation to fight climate change in several declarations since 2009 (see Annexure). In light of the above statements, the purpose of the study group created this year is to seek to build stronger consensus among the G20 members on ways to effectively mobilize resources in support of the broader multilateral processes underway, including to contribute to the work of the UNFCCC.

FOCUS

At their meeting in 2012, the Leaders reiterated their 2011 mandate for G20 Finance Ministers: *to consider ways to effectively mobilize resource*s. The work of the study group is strictly framed by this mandate.

G20 Finance Ministers have been presented, but not endorsed, two reports on the question of Climate Finance at their previous meetings: the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing (AGF Report)* in November 2010 and *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers*, coordinated by the World Bank and the IMF, in October 2011.

The study group provides an opportunity to discuss among others the content of these analyses and advance consideration of climate finance sources.

PARTICIPATION

The discussion of options will take place amongst the G20 members participating in the study group. In undertaking their work, the group may request the technical support provided by IOs or other entities, as needed; yet the G20 members of the group will be solely responsible for submitting any agreed deliverable to the Finance Ministers.

WORK OF THE STUDY GROUP

Taking into account the short timeframe on which to deliver on this instruction from Leaders, the study group will pursue the following activities:

1. Review lessons learned on how to effectively mobilize climate finance from experiences to date (notably based on reporting from UNFCCC, as well as information provided by G20 members, IFIs and other relevant fora).
2. Review the options for effectively mobilizing resources outlined in the reports presented to G20 Finance Ministers, as well as other potential options, and receive any additional analysis from G20 members;
3. Exchange views on these options, taking into account all potential impacts, and their implications taking into account the objectives, provisions and principles of UNFCCC.

DELIVERABLES

The study group will provide a progress report to the G20 Finance Ministers on the possible ways to effectively mobilize resources for Climate Finance. This may include an assessment of where specific technical and other analysis may be helpful in supporting the effort to build a common understanding within the G20 membership.

TENTATIVE WORK PROGRAM & CALENDAR

August	Agreement on the TOR Agreement on the questionnaire Agreement on a date and venue for the face to face meeting required to draft the report
September	Country returns of questionnaires Face to face meeting towards an agreed draft report on the progress of the study group, based on country responses to the questionnaires (Sept. 23, Mexico City)
October	Agreement on the progress report
November	Submission of the progress report to Ministers

ANNEXURE

2009: *'33. we welcome the work of the Finance Ministers* ***and direct them to report back at their next meeting with a range of possible options for climate change financing*** *to be provided as a resource to be considered in the UNFCCC negotiations at Copenhagen'* (Pittsburgh)

2010: *'41. We reiterate our commitment to a green recovery and to sustainable global growth. Those of us who have associated with the Copenhagen Accord reaffirm our support for it and its implementation and call on others to associate with it. We are committed to engage in negotiations under the UNFCCC on the basis of its objective provisions and principles including common but differentiated responsibilities and respective capabilities and are determined to ensure a successful outcome through an inclusive process at the Cancun Conferences. ….* ***We look forward to the outcome of the UN Secretary-General's High-Level Advisory Group on Climate Change Financing which is, inter alia, exploring innovative financing.*** *42. We note with appreciation the report on energy subsidies from the International Energy Agency (IEA), Organization of the Petroleum Exporting Countries (OPEC), OECD and World Bank. We welcome the work of Finance and Energy Ministers in delivering implementation strategies and timeframes, based on national circumstances, for the rationalization and phase out over the medium term of inefficient fossil fuel subsidies that encourage wasteful consumption, taking into account vulnerable groups and their development needs. We also encourage continued and full implementation of country specific strategies and will continue to review progress towards this commitment at upcoming summits'* (Toronto)

2010: *'66. … In this regard we* ***welcome the work of the High-level Advisory Group on Climate Change Financing established by the UN Secretary General and ask our Finance Ministers to consider its report****. We also support and encourage the delivery of fast-start finance commitments'* (Seoul)

2011: *'63. Financing the fight against climate change is one of our main priorities. In Copenhagen, developed countries have committed to the goal of mobilizing jointly USD 100 billion per year from all sources by 2020 to assist developing countries to mitigate and adapt to the impact of climate change, in the context of meaningful mitigation actions and transparency.* ***We discussed the World Bank -- IMF -- OECD -- regional development banks report on climate finance and call for continued work taking into account the objectives, provisions and principles of the UNFCCC by international financial institutions and the relevant UN organizations****.* ***We ask our Finance Ministers to report to us at our next Summit on progress made on climate finance****; 64. We reaffirm that climate finance will come from a wide variety of sources, public and private, bilateral and multilateral, including innovative sources of finance. We recognize the role of public finance and public policy in supporting climate-related investments in developing countries. We underline the role of the private sector in supporting climate-related investments globally, particularly through various market-based mechanisms and also call on the MDBs to develop new and innovative financial instruments to increase their leveraging effect on private flows*. (Cannes)

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

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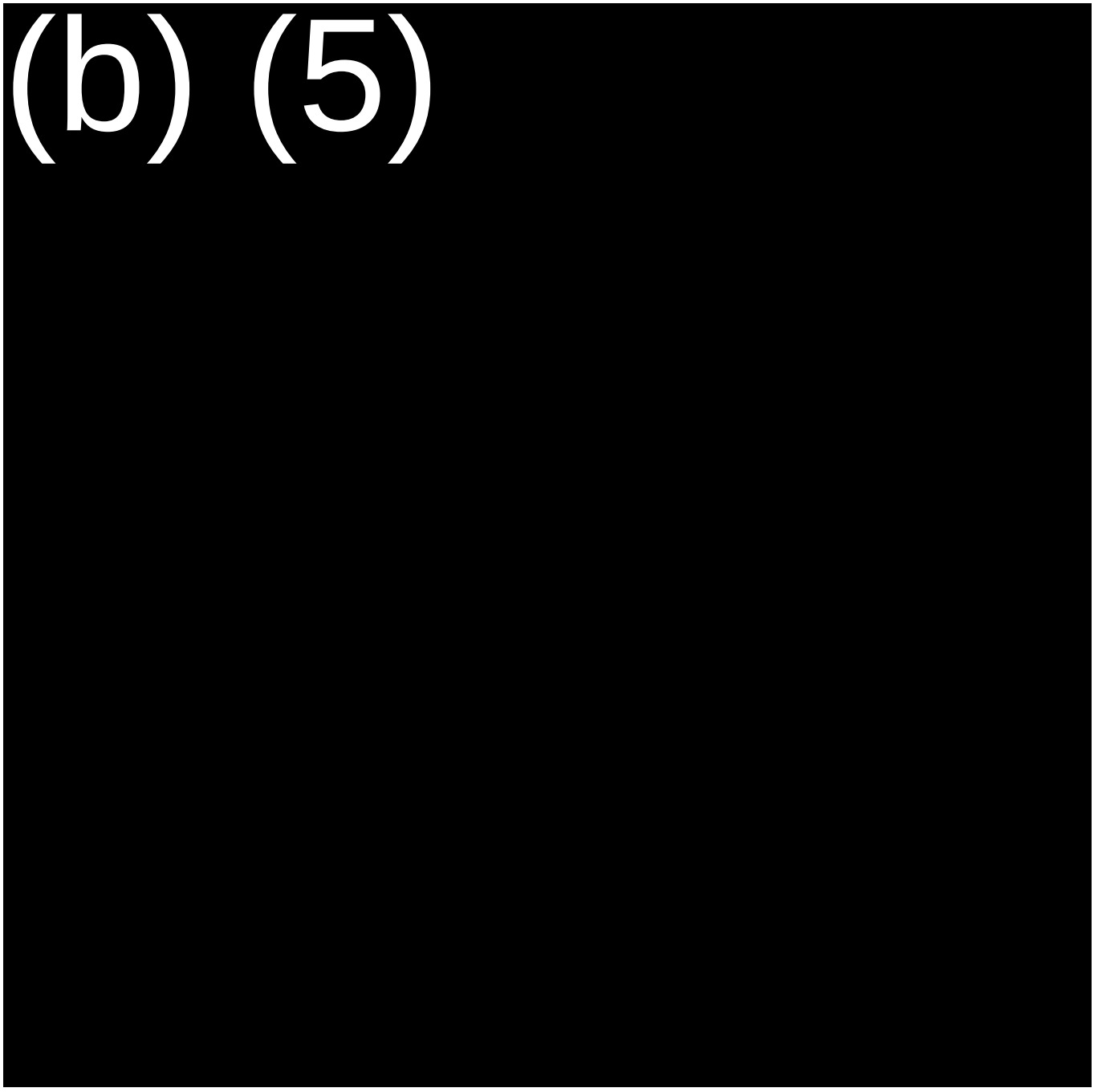

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The IFI Report to the G20 considers that this modality may have very significant financing and mitigation potential.

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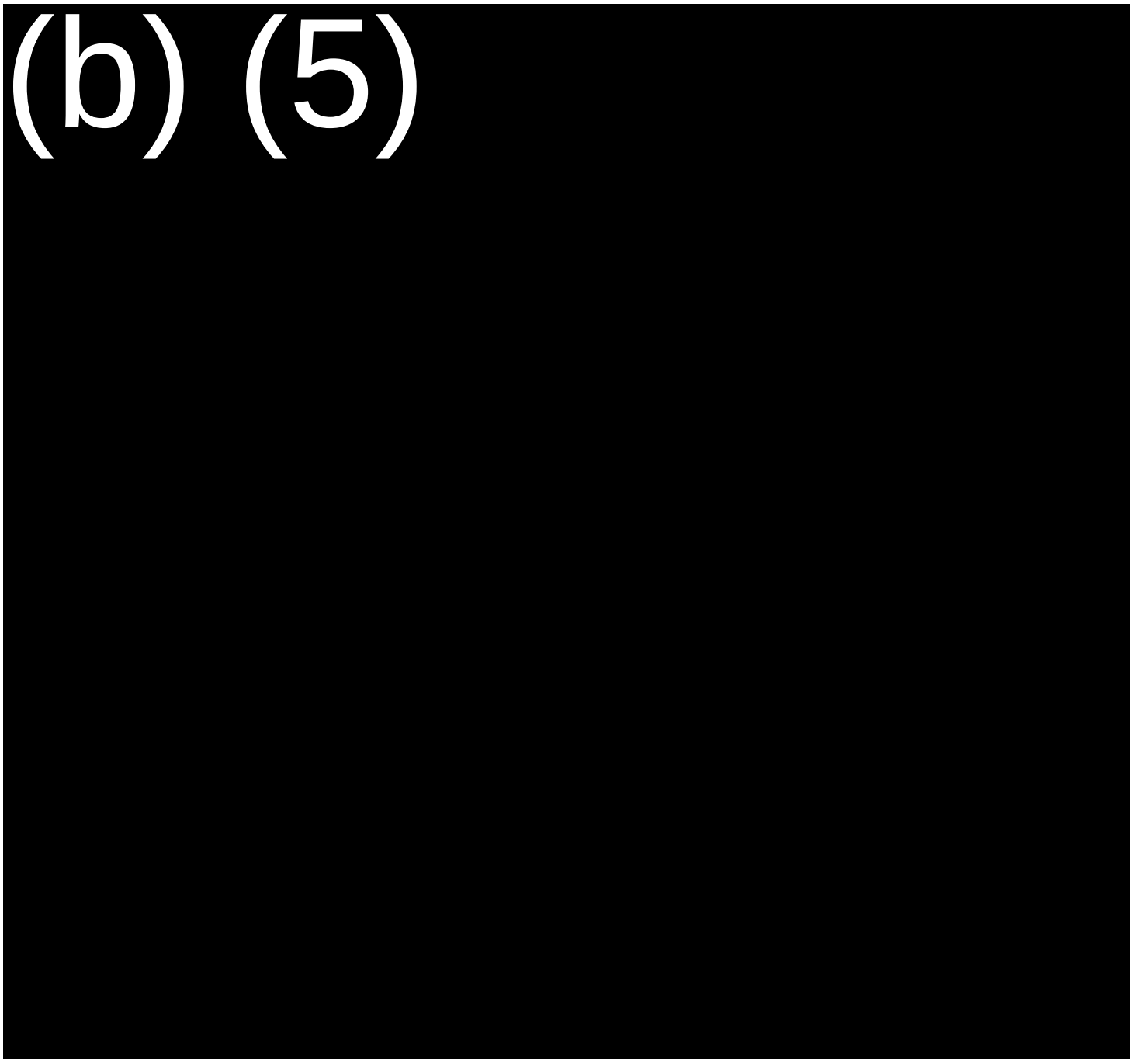

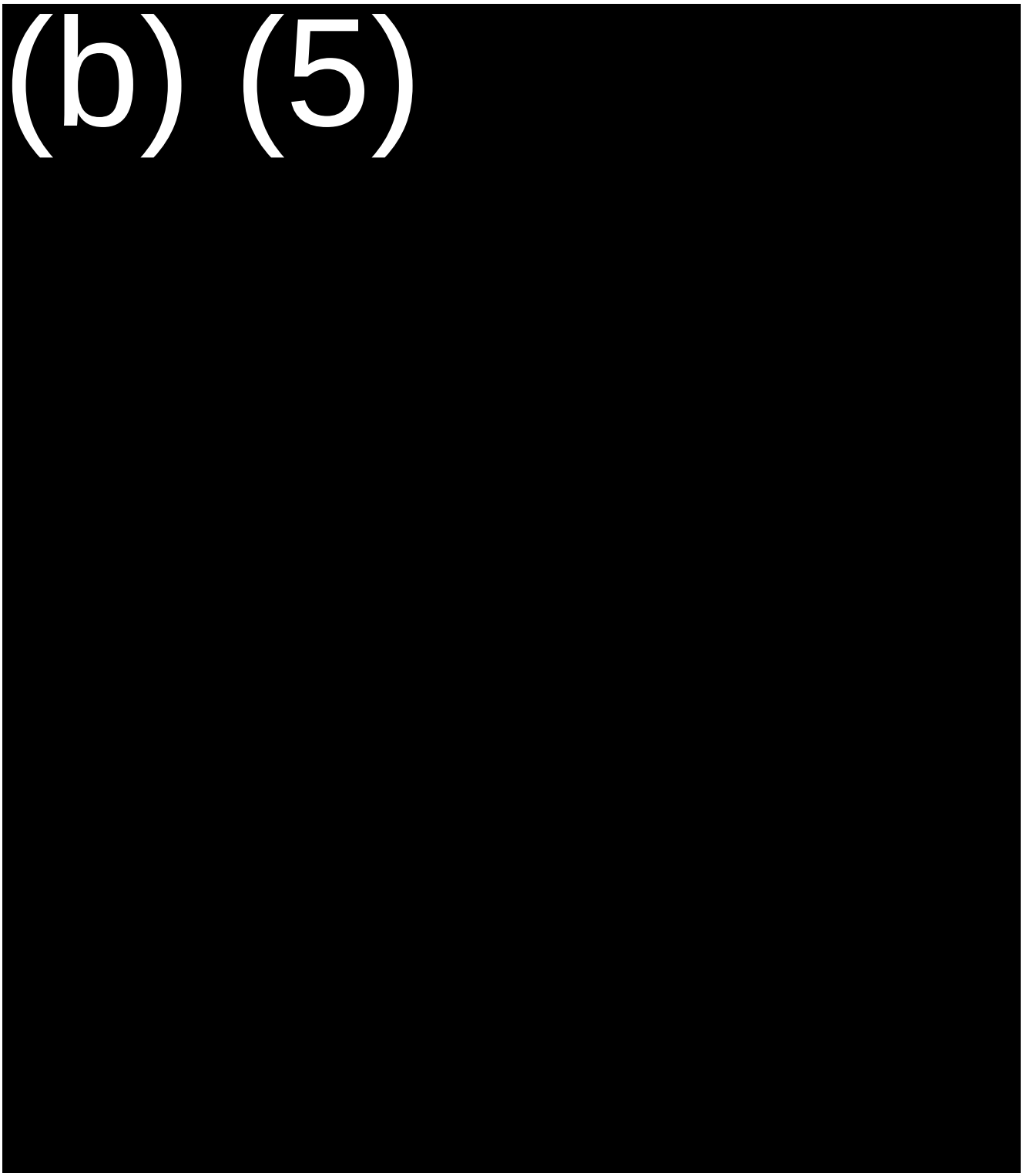

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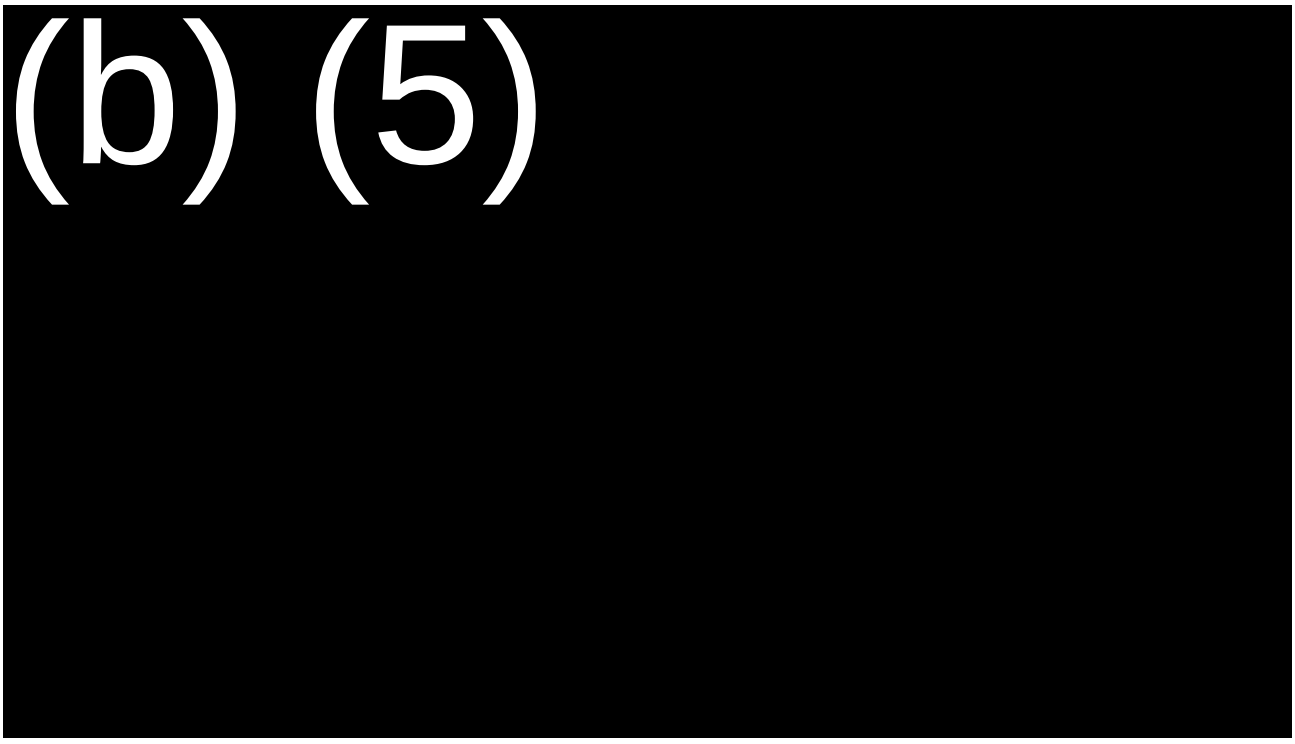

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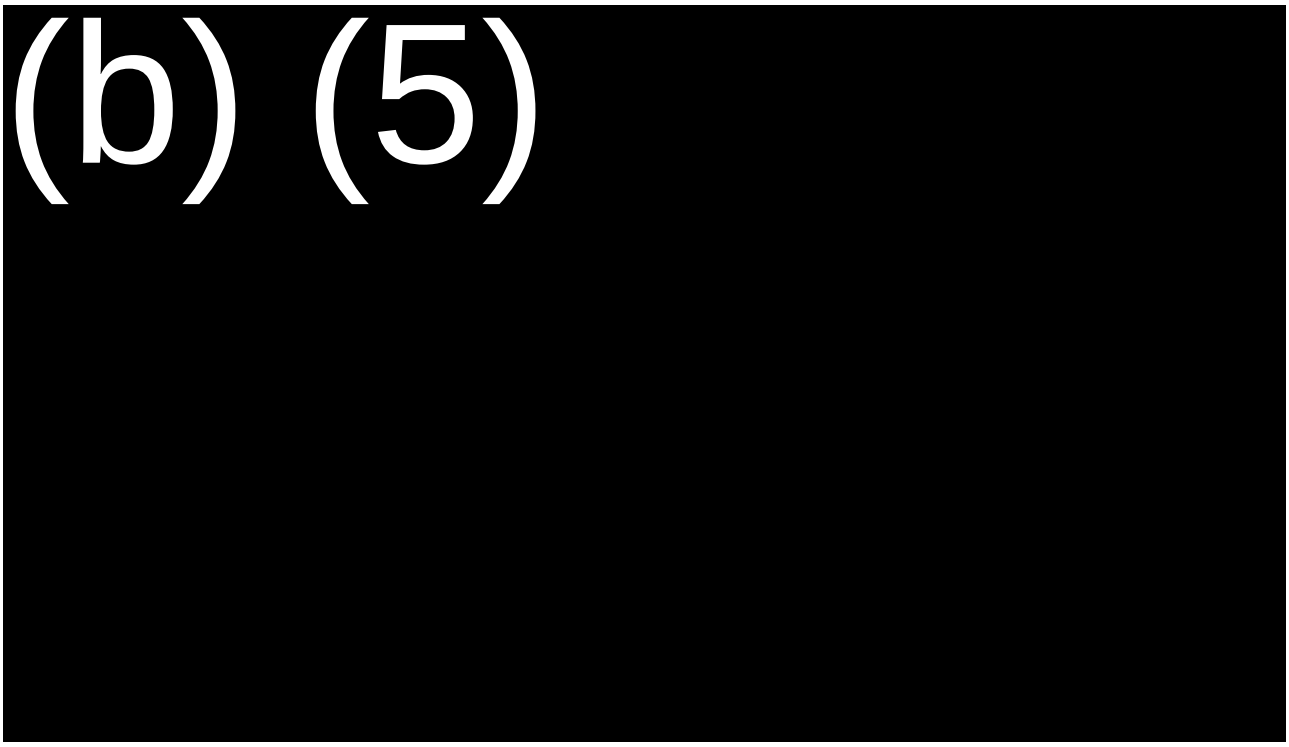

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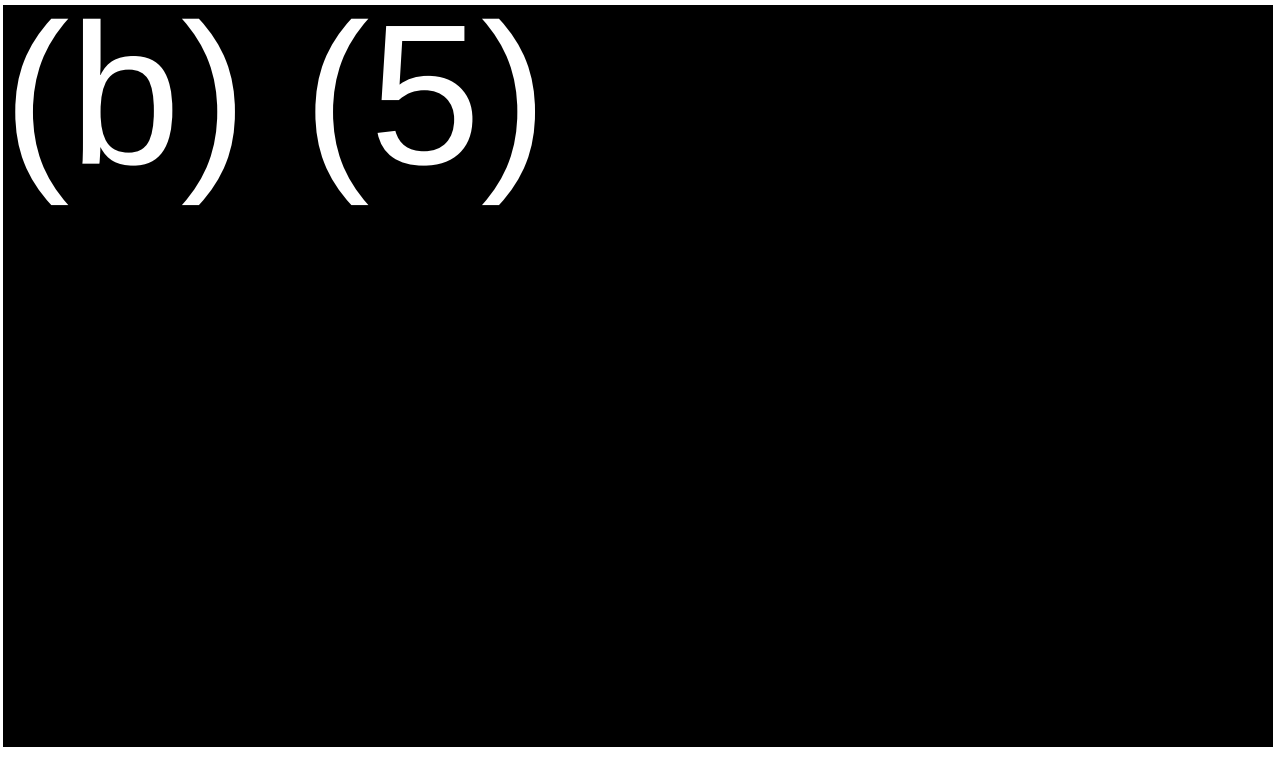

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[redacted]

From:	Heil, Mark
To:	Tonkonogy, Bella; "Maurice LeFranc"
Cc:	Hall, Daniel; Berg, Katie; Jaffe, Judson
Subject:	RE: updated G20 questionnaire
Date:	Wednesday, September 19, 2012 11:23:02 AM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US Questionnaire_mh.docx

Bella, sorry of the delay. A few small comments attached for your consideration.

Thanks,
Mark

From: Tonkonogy, Bella
Sent: Tuesday, September 18, 2012 6:13 PM
To: 'Maurice LeFranc'; Heil, Mark
Cc: Hall, Daniel; Berg, Katie; Jaffe, Judson
Subject: updated G20 questionnaire

Maurice, Mark-

If either of you wish to comment, attached is the updated version of the G20 study group questionnaire, incorporating State and FAA comments, as well as some internal Treasury. I'm also still working out one paragraph on private sector. Any additional comments appreciated first thing tomorrow.

Thanks,
Bella

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

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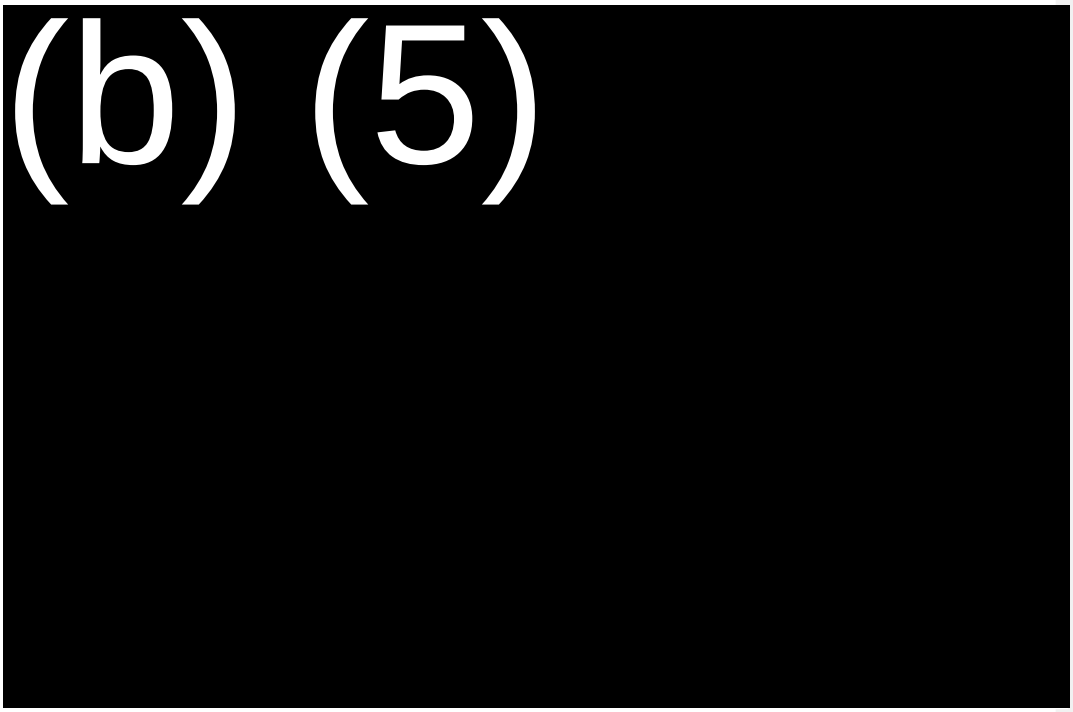

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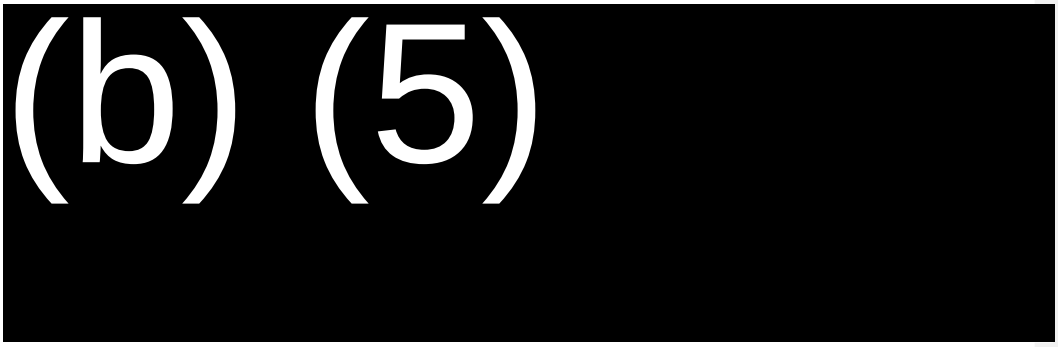

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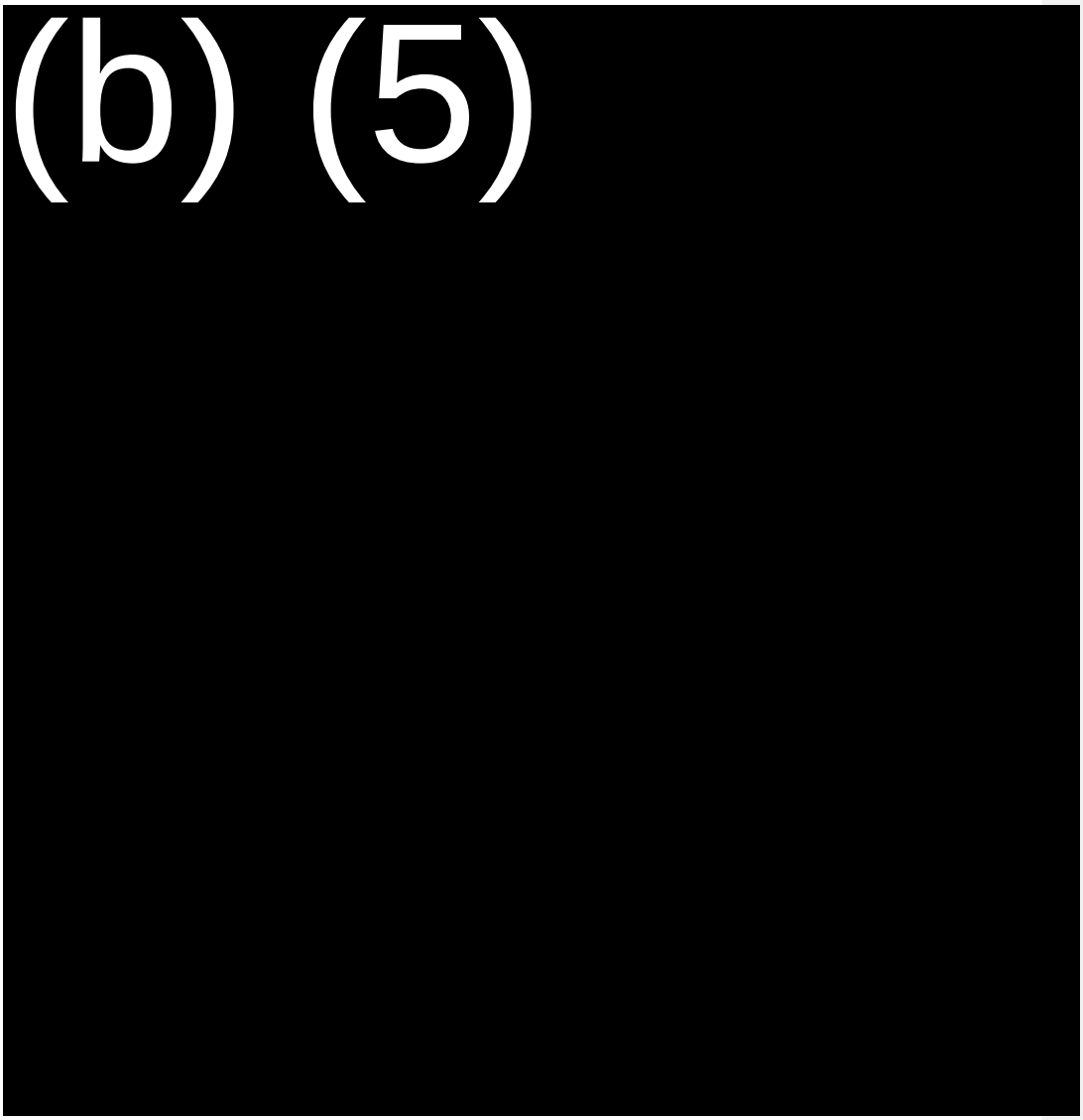

(b) (5)

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(b) (5)

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(b) (5)

(b) (5)

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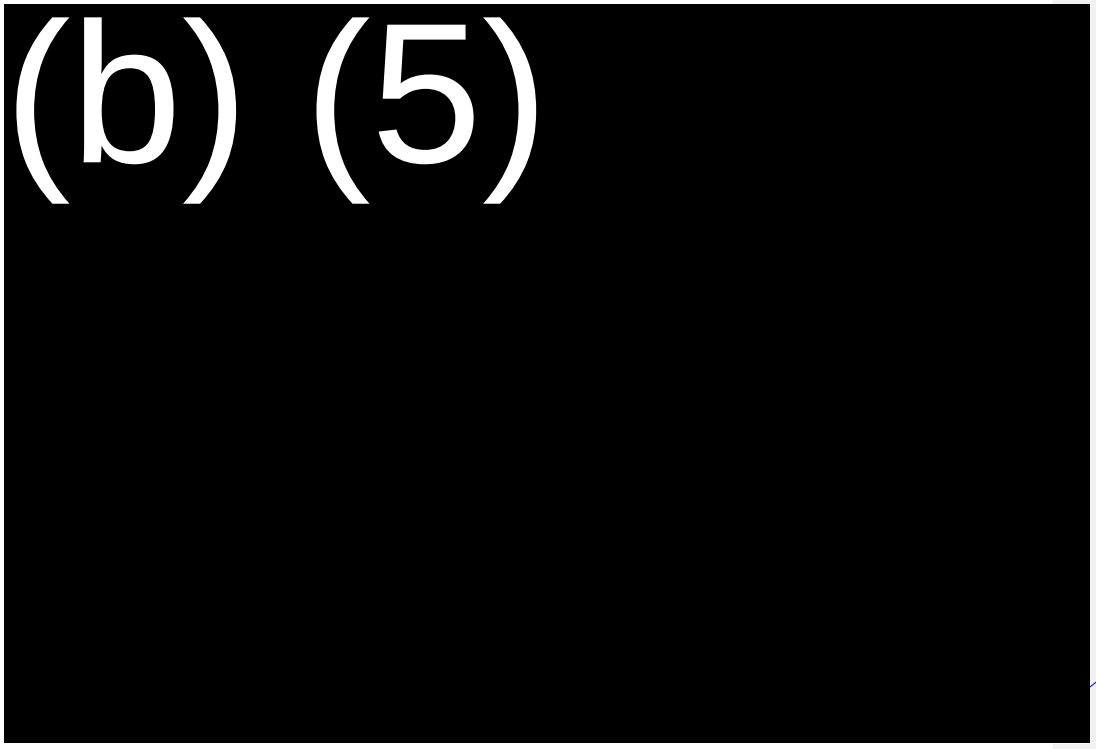

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From:	Tonkonogy, Bella
To:	Hall, Daniel; Jaffe, Judson
Subject:	FW: updated G20 questionnaire
Date:	Wednesday, September 19, 2012 1:51:17 PM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US Questionnaire_mh.docx

Daniel, Jud-

(b)(5) [redacted]

Thanks,
Bella

From: Heil, Mark
Sent: Wednesday, September 19, 2012 11:23 AM
To: Tonkonogy, Bella; 'Maurice LeFranc'
Cc: Hall, Daniel; Berg, Katie; Jaffe, Judson
Subject: RE: updated G20 questionnaire

Bella, sorry of the delay. A few small comments attached for your consideration.

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Mark

From: Tonkonogy, Bella
Sent: Tuesday, September 18, 2012 6:13 PM
To: 'Maurice LeFranc'; Heil, Mark
Cc: Hall, Daniel; Berg, Katie; Jaffe, Judson
Subject: updated G20 questionnaire

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[redacted]

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[redacted]

(b) (5)

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(b) (5)

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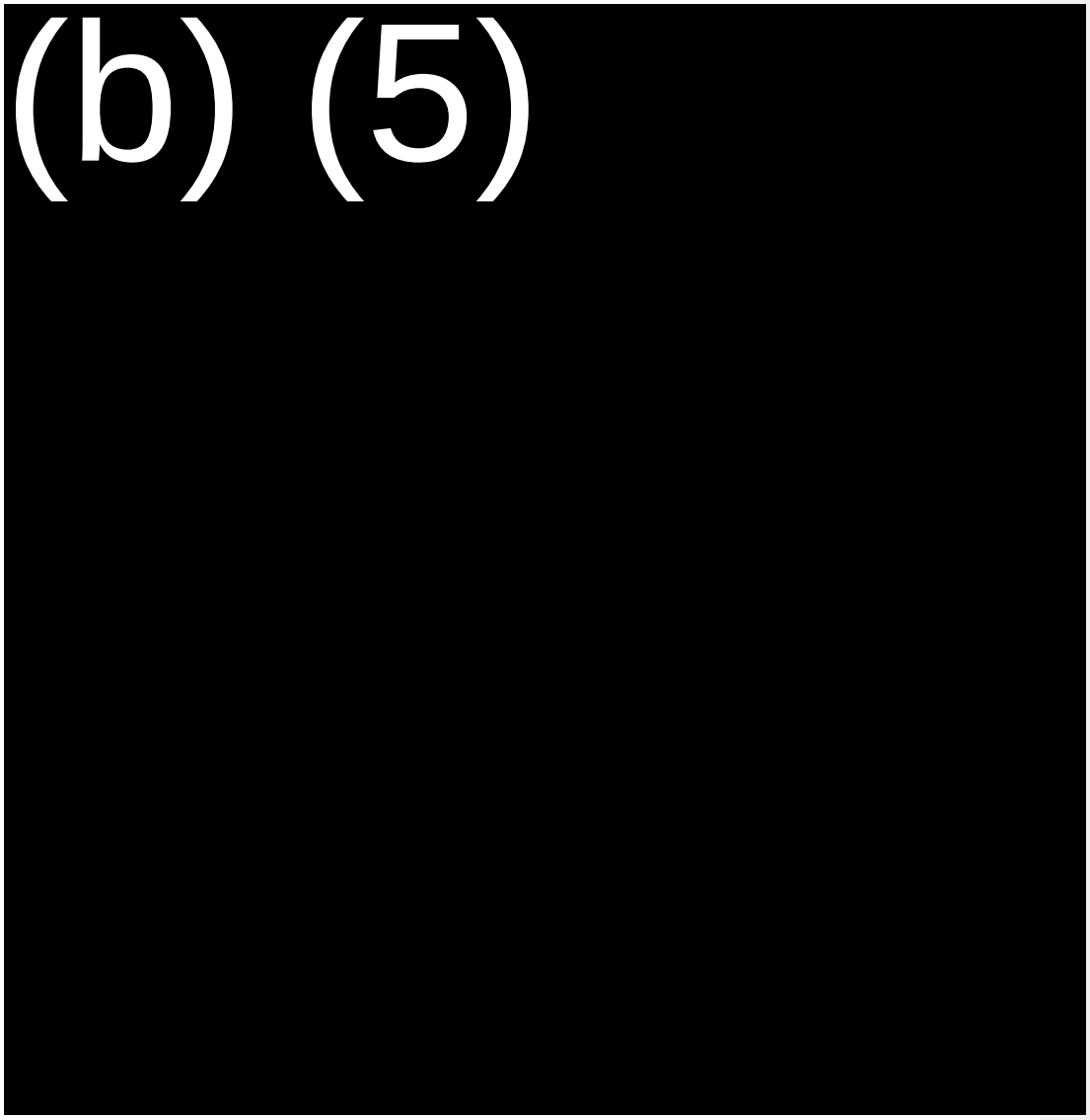

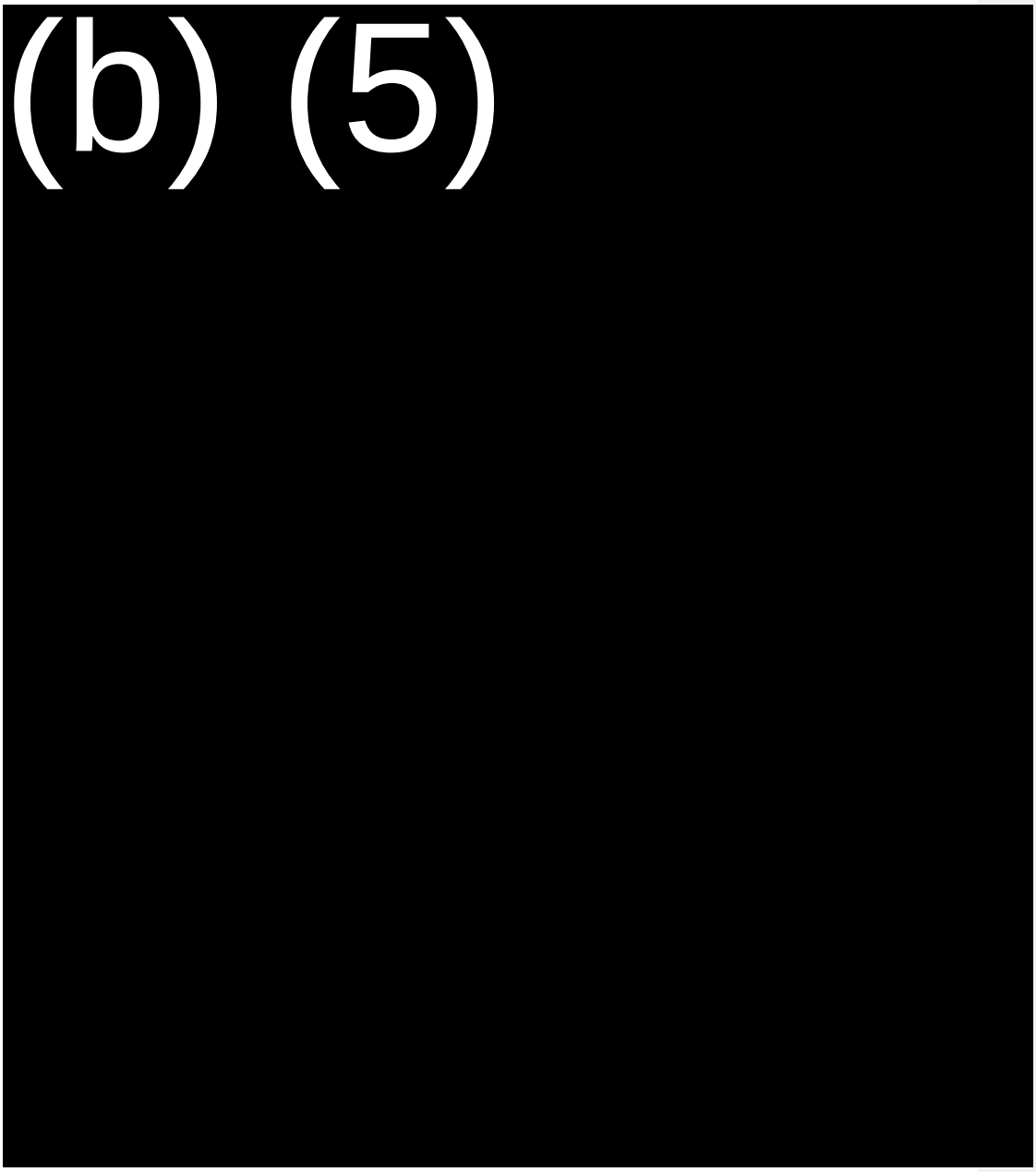

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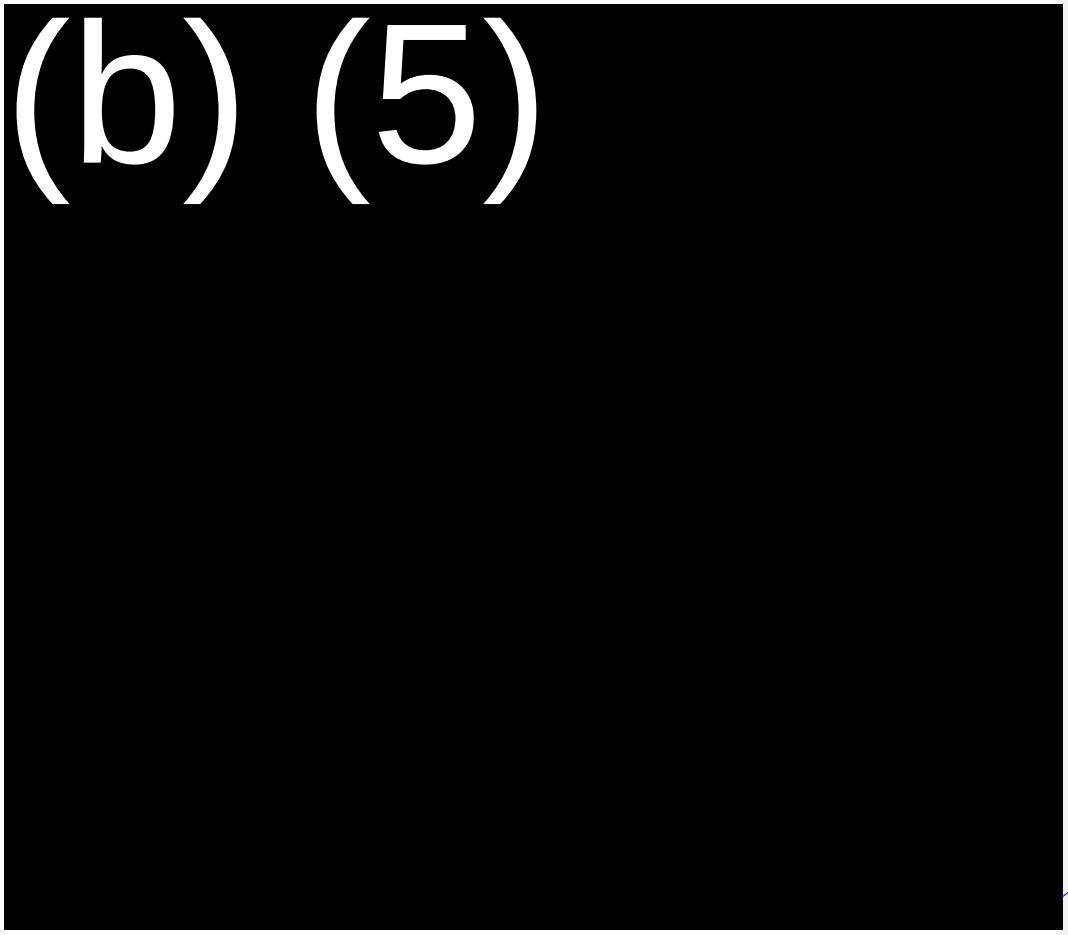

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(b) (5)

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From: Hall, Daniel
To: Jaffe, Judson; Tonkonogy, Bella
Subject: RE: updated G20 questionnaire
Date: Wednesday, September 19, 2012 3:14:32 PM
Attachments: G20 STUDY GROUP ON CLIMATE FINANCE_US Questionnaire_mh dh edits.docx

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(b)(5) [redacted]

[redacted]

[redacted]

From: Jaffe, Judson
Sent: Wednesday, September 19, 2012 1:54 PM
To: Tonkonogy, Bella; Hall, Daniel
Subject: RE: updated G20 questionnaire

Regarding Mark's first comment:

(b) (5) [redacted]

(b)(5) [redacted]

Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

From: Tonkonogy, Bella
Sent: Wednesday, September 19, 2012 1:51 PM

To: Hall, Daniel; Jaffe, Judson
Subject: FW: updated G20 questionnaire

Daniel, Jud-

(b)(5) [redacted]

Thanks,
Bella

From: Heil, Mark
Sent: Wednesday, September 19, 2012 11:23 AM
To: Tonkonogy, Bella; 'Maurice LeFranc'
Cc: Hall, Daniel; Berg, Katie; Jaffe, Judson
Subject: RE: updated G20 questionnaire

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Sent: Tuesday, September 18, 2012 6:13 PM
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Cc: Hall, Daniel; Berg, Katie; Jaffe, Judson
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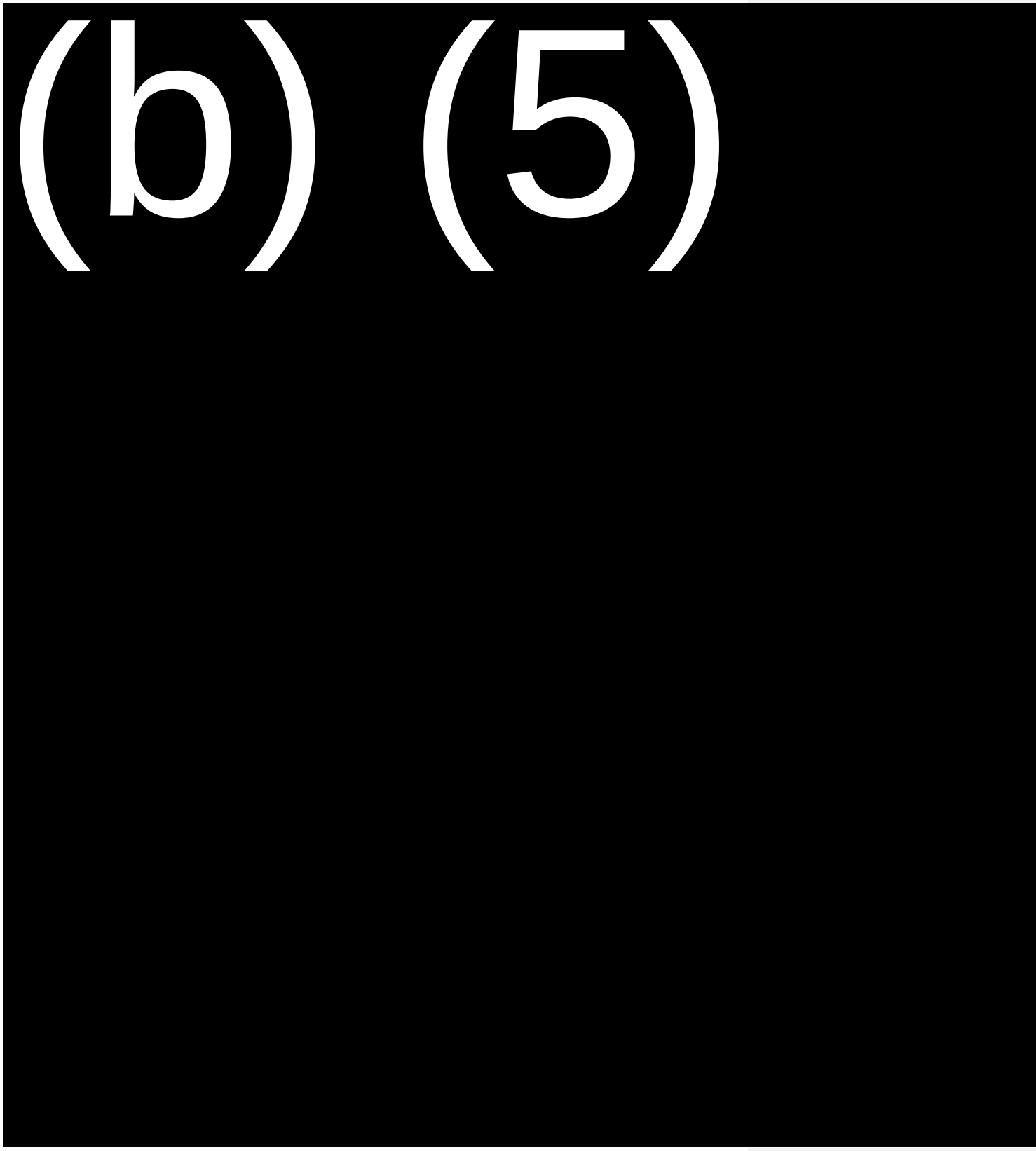
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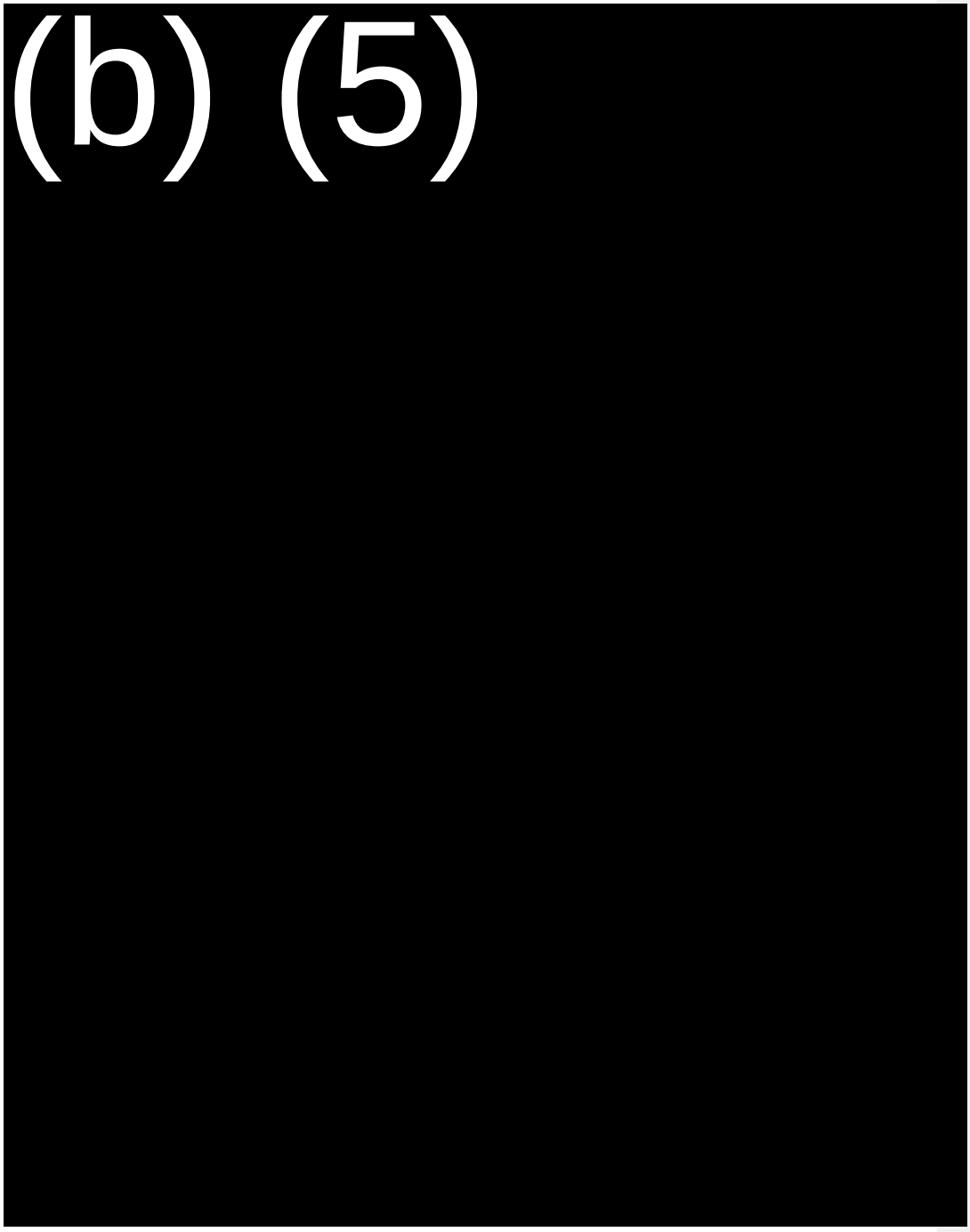

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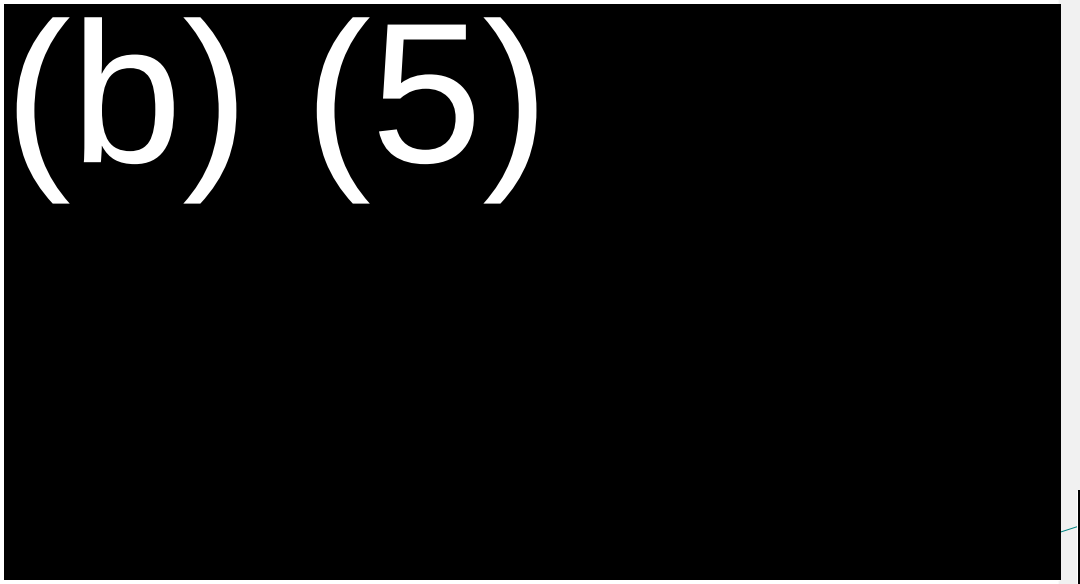

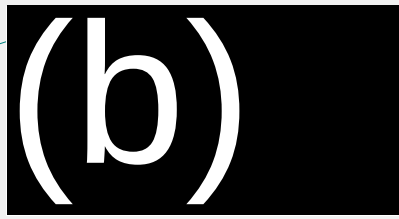

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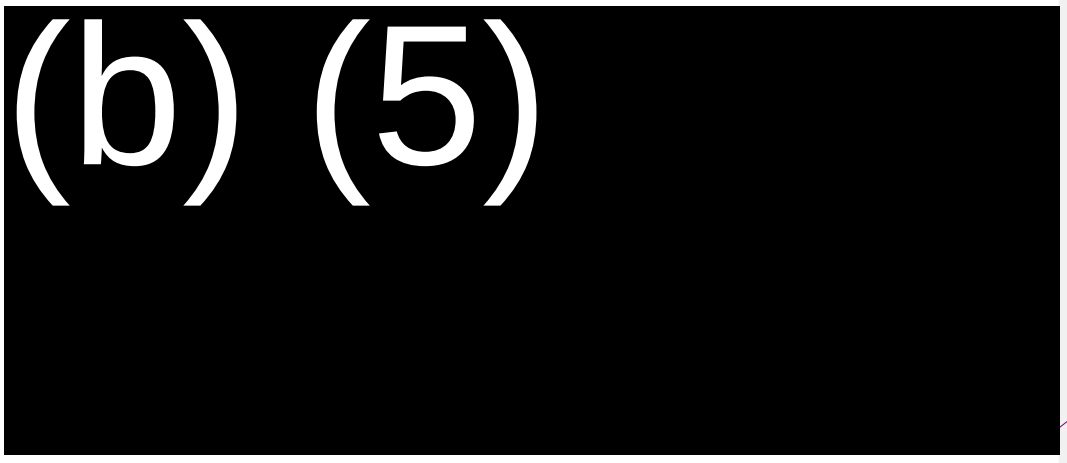

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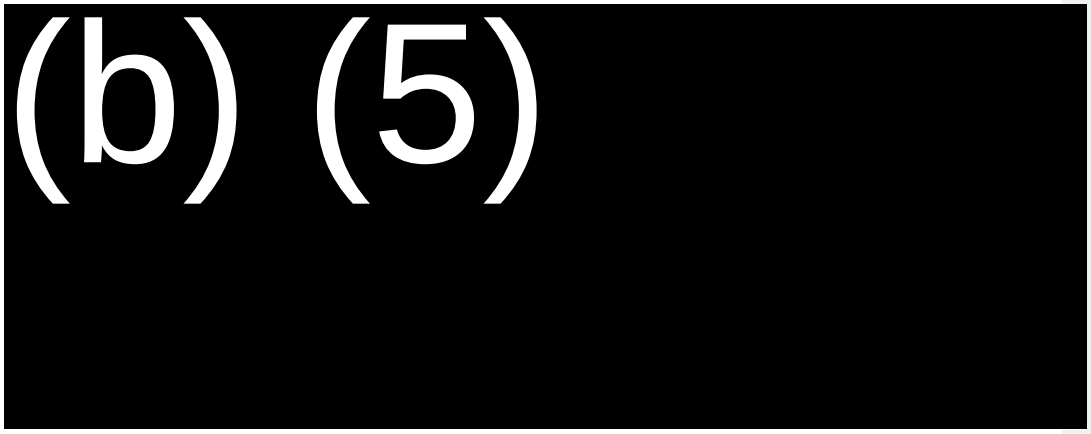
(b) (5)

From:	Tonkonogy, Bella
To:	Urbanas, Elizabeth (Beth)
Subject:	g20 questionnaire
Date:	Thursday, September 20, 2012 11:44:00 AM
Attachments:	G20 STUDY GROUP ON CLIMATE FINANCE_US_FINAL092012.docx

Beth,

Did you want to look at this? This reflects everyone's clearance except Pete who I'm waiting on.

Thanks,
Bella

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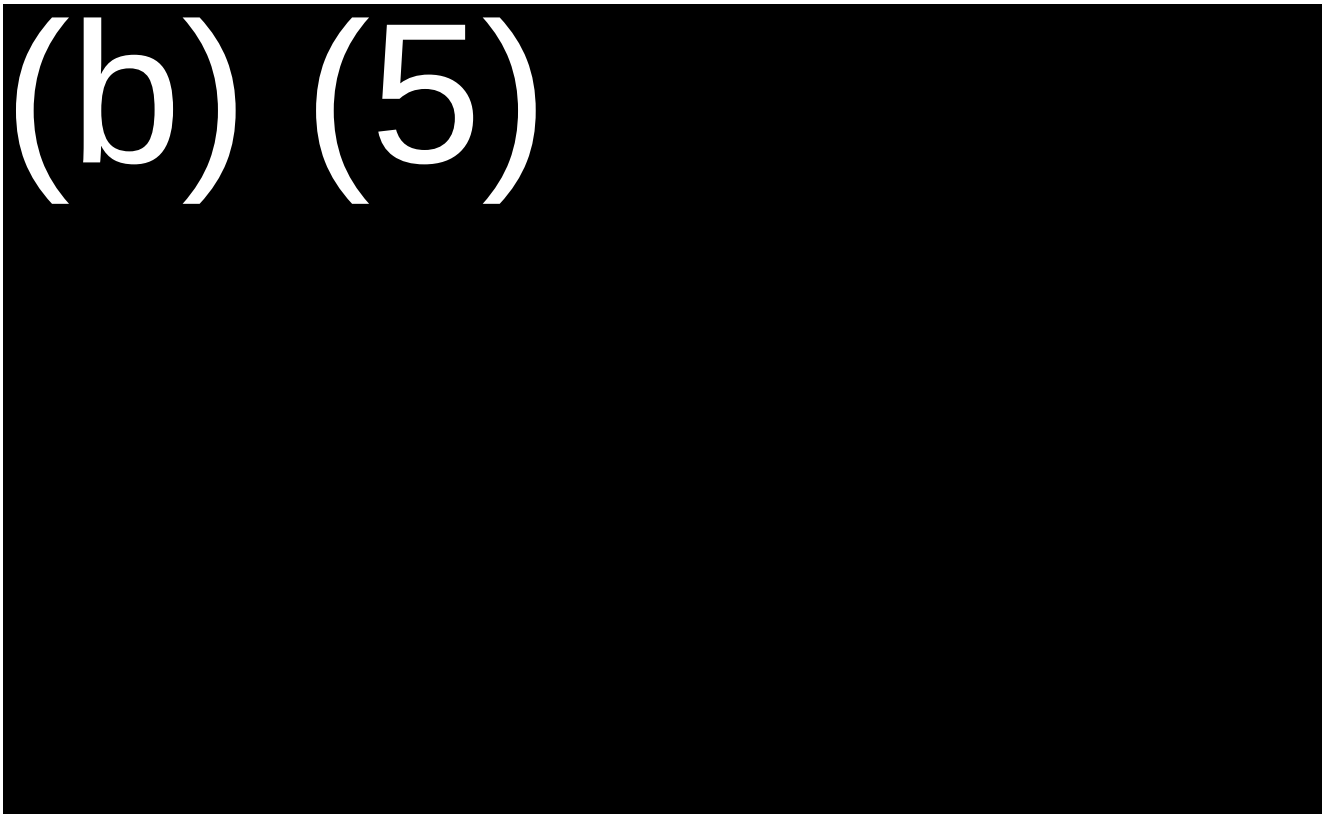

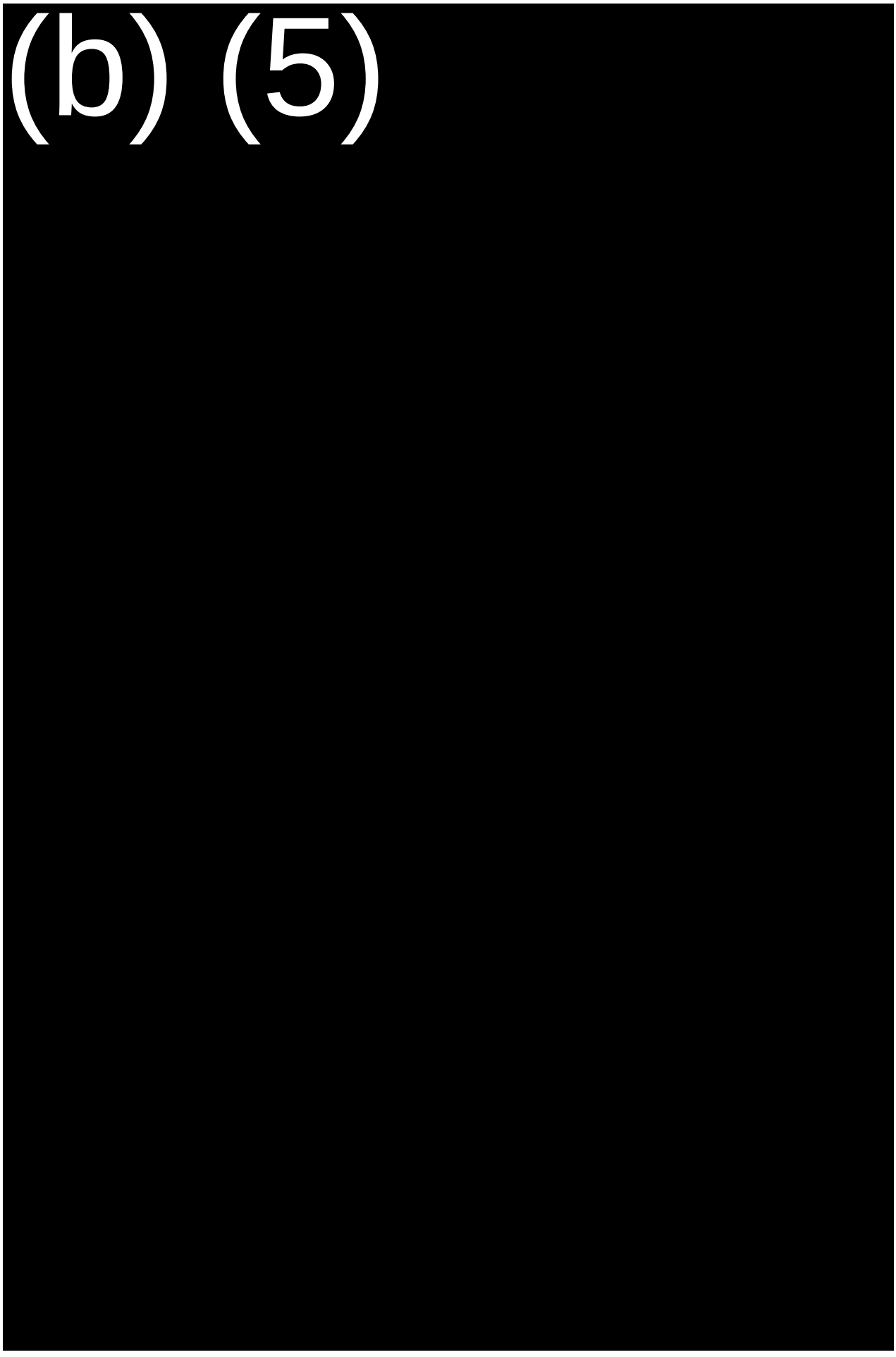
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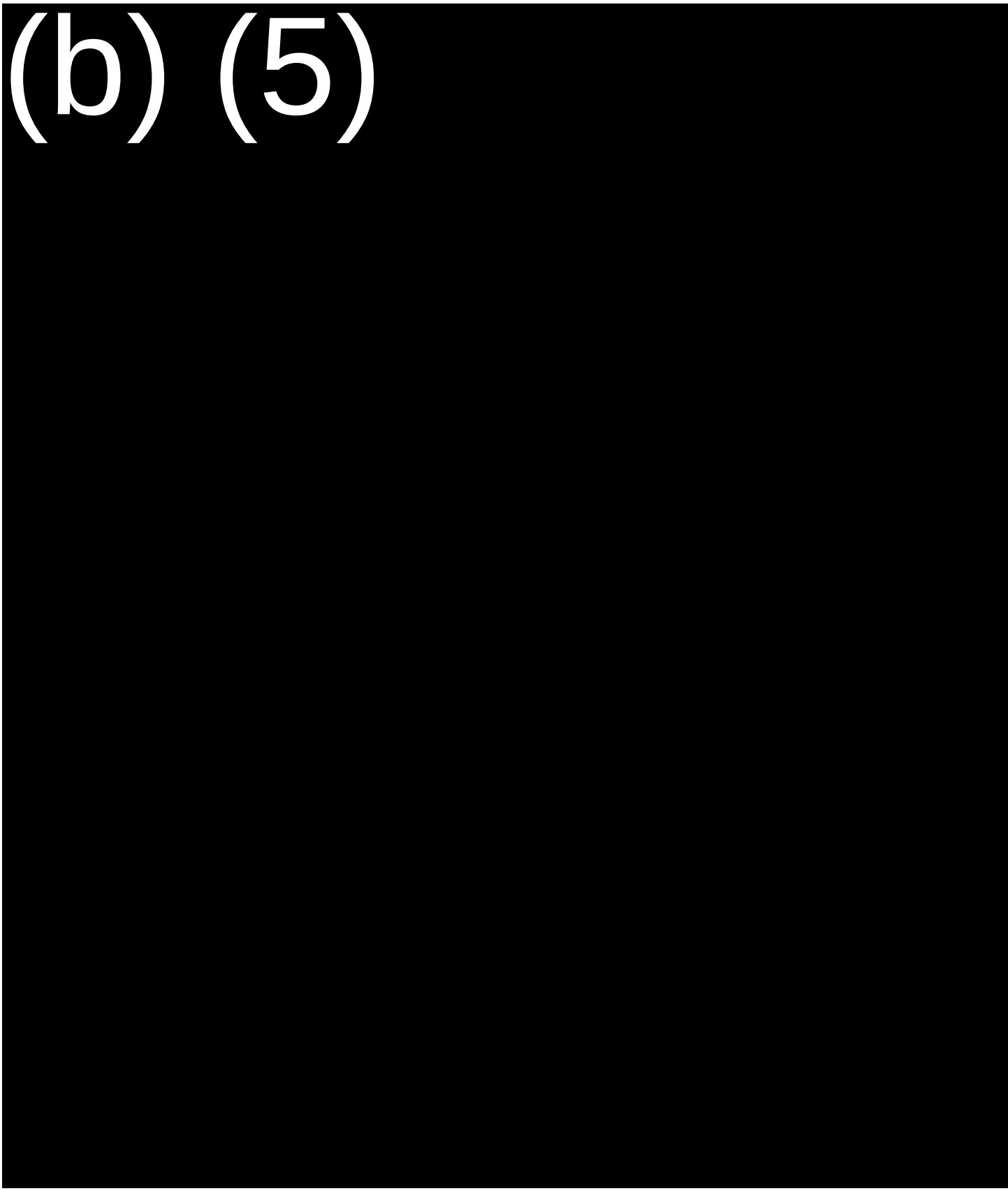

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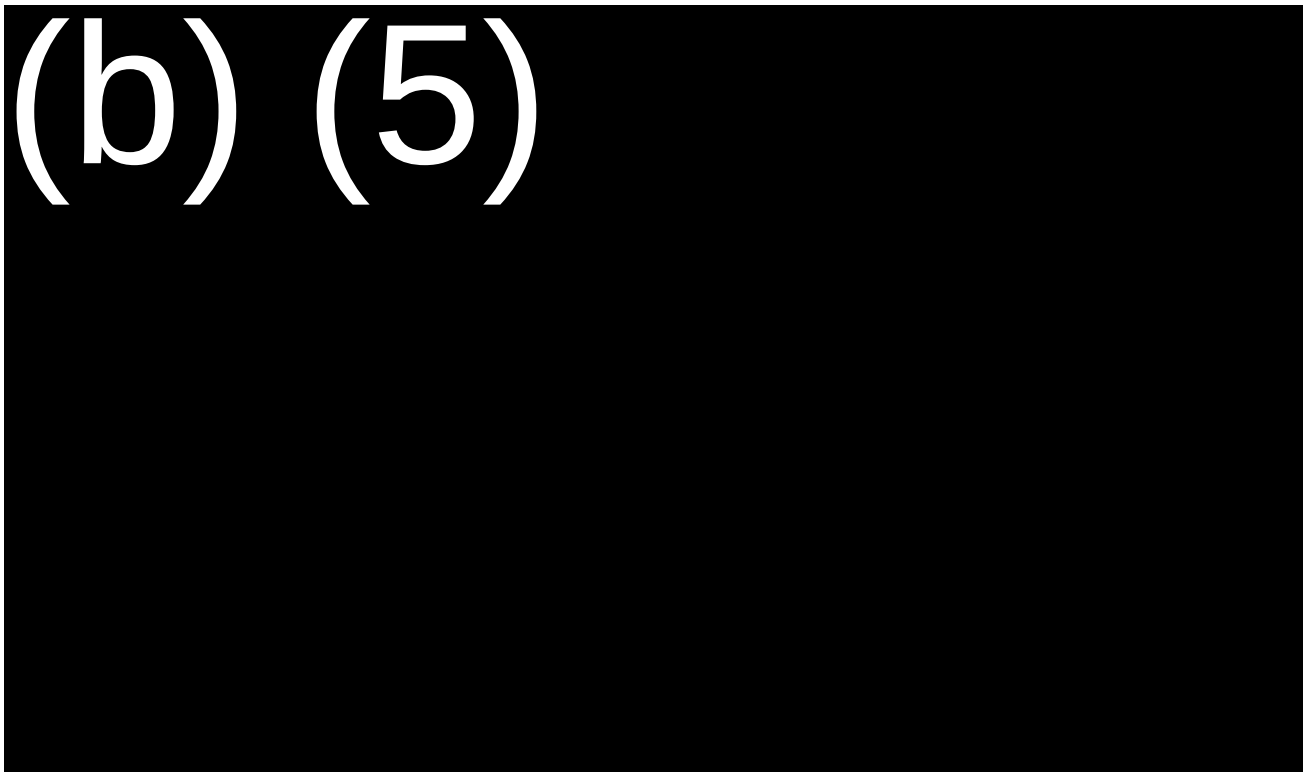

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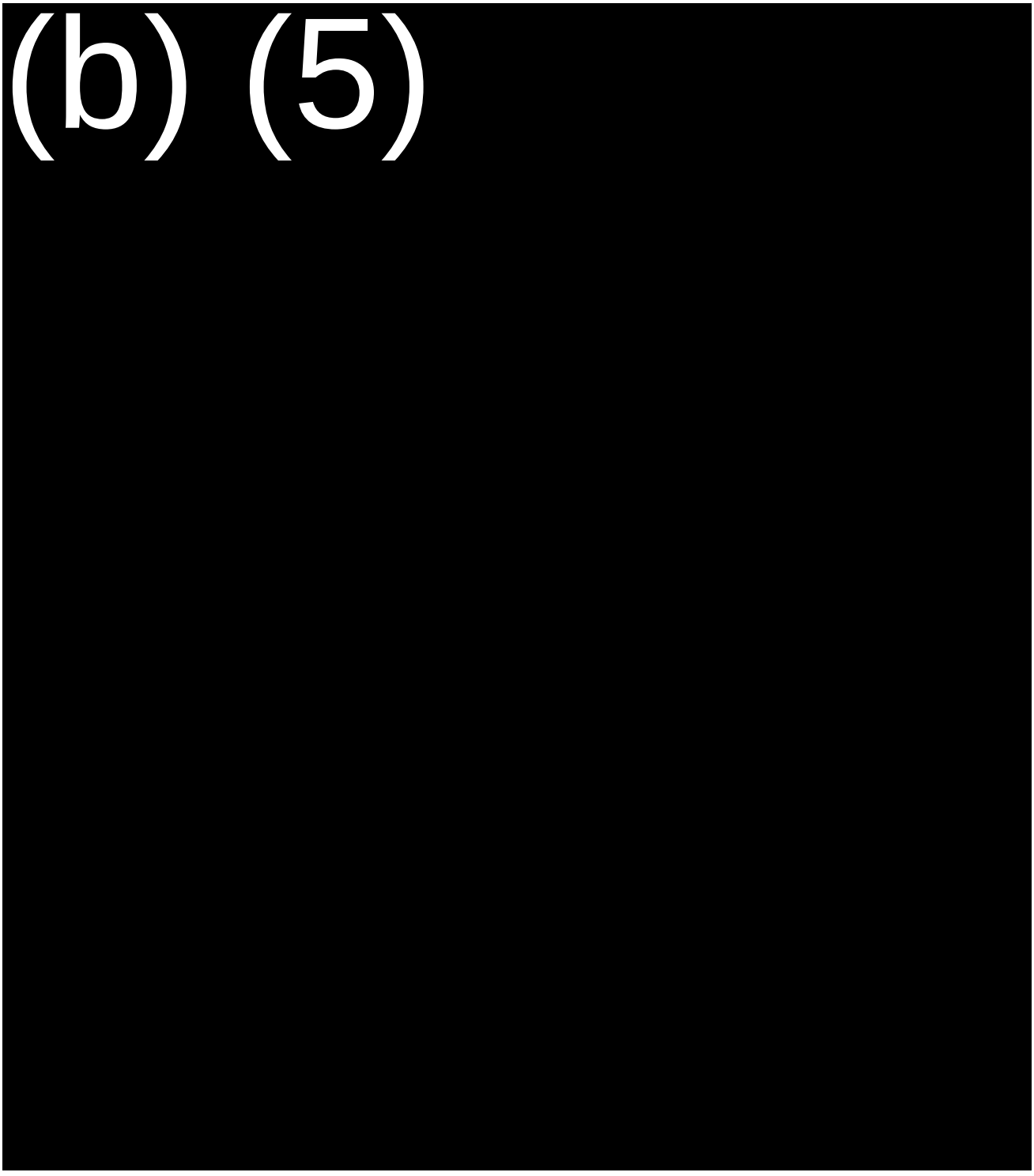
- *Are carbon markets, including offsetting mechanisms, a promising way to mobilize private flows? What could be done to deal with the challenges and short term concerns such as the volatility and low price of carbon credits and what could be learnt from countries that have dealt with these challenges?*
- *What could the G20 expect from the UNFCCC and other fora to enhance this instrument and what could be its own role?*

ISSUE 6: Direct Budget Transfers and instruments to engage Private Finance

Direct budget transfers a key role in the mobilization of climate finance, responding to needs which private flows may address only imperfectly. Nevertheless, the dominant scale of global private capital markets suggest that the private sector will need to play a central role in the mobilization of climate finance in the long run. Public policy and finance play a crucial dual role by establishing the incentive frameworks needed to catalyze high levels of investment in mitigation and adaptation activities including by generating public resources that can be targeted at market failures and other barriers to private finance.

- *What are the crucial elements of an incentive framework needed to catalyze high levels of climate-related investments, including from private finance??*
- *What role could direct budget contributions play in that regard?*
- *How should countries that have made commitments to additional public financing cooperate to leverage most effectively private sector investment?*
- *What measures could be taken to ensure that private finance also address adaptation projects and also take into account country ownership and national development priorities of developing countries?*

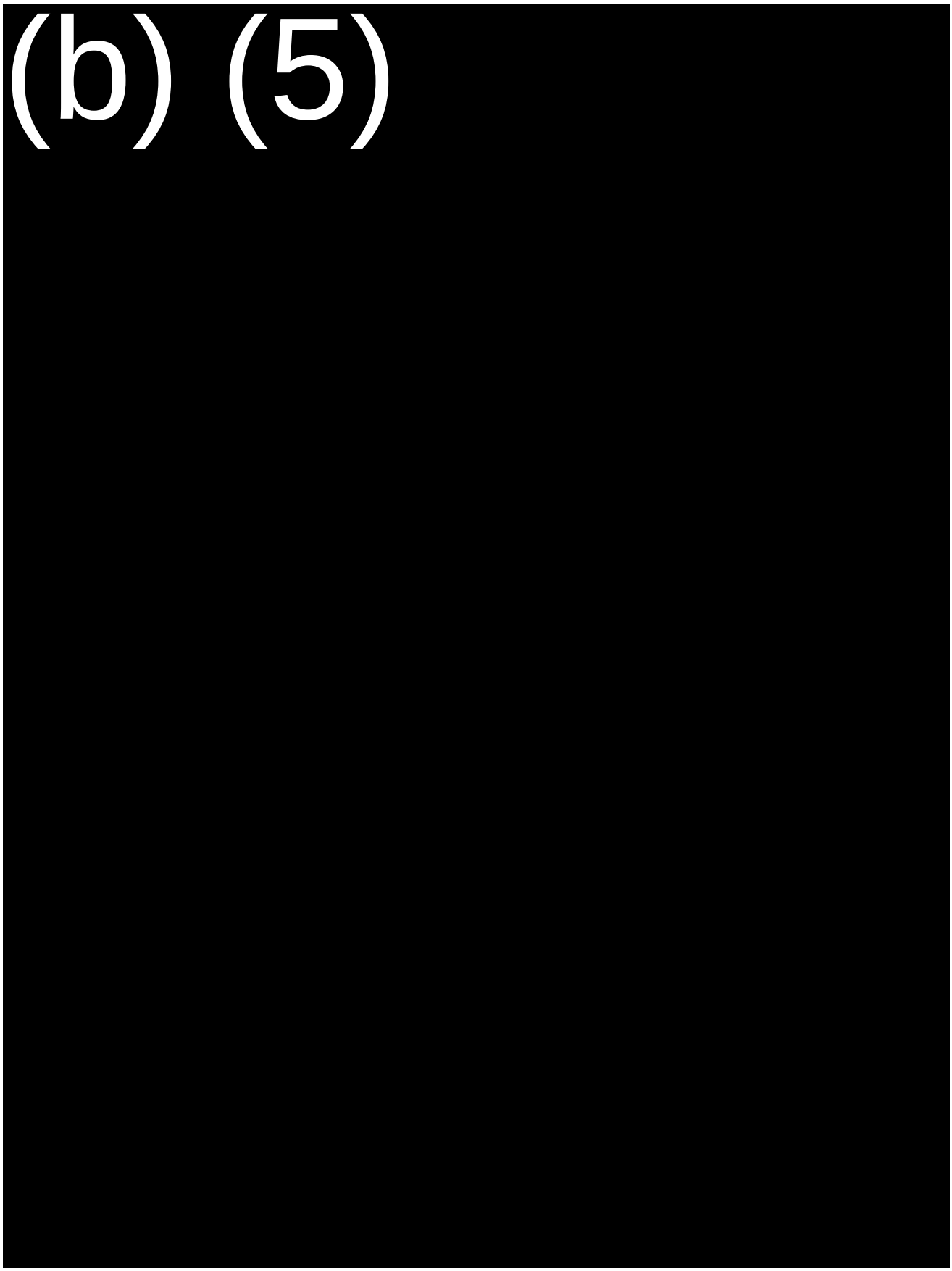


ISSUE 7: MDB resources

The *MDBs* also play a key role in leveraging financing flows, by using instruments such as loans, guarantees, grants or equity.

- *What role could MDB resources play with respect to climate finance?*

- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*



From: Metcalf, Gilbert
To: (b)(6)
Subject: Fw: g20 study group
Date: Friday, September 21, 2012 8:55:59 AM
Attachments: CFSG Agenda_Annotated.docx
G20 STUDY GROUP ON CLIMATE FINANCE_US_FINAL092012.docx

Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

From: Tonkonogy, Bella
Sent: Thursday, September 20, 2012 05:30 PM
To: Metcalf, Gilbert; Urbanas, Elizabeth (Beth)
Cc: Demopulos, Abigail
Subject: g20 study group

Gib-

I've drafted your points for Sunday. (b)(5)

Beth/Abby- would be great to get any additional thoughts.

We gave Charles basic TPs for the deputies meeting which is Monday- we will have to brief him or Jason on the outcome of the study group meeting right after it's over- they start their stuff at 4:30pm (ours ends at 3).

On the questionnaire- still waiting for Pete's ok. (b)(5)

Thanks,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

From: Tonkonogy, Bella
To: (b)(1) [redacted]
Subject: RE: [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City
Date: Saturday, September 22, 2012 7:38:22 PM
Attachments: CFSG Questionnaire_US Response.docx

On behalf of Gib Metcalf

Dear colleagues-
Attached please find the US responses to the questionnaire.

_____
Bella Tonkonogy
US Department of the Treasury
(b)(1) [redacted]

(b)(1)

[redacted]

Subject: RE : [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear all,

please find attached mexico's answers to the questionnaire that I am circulating to all of you.

Best,

Elise

(b)(1)

[redacted]

(b)(1)

[redacted]

Objet : RE : [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear all,

please find attadched Argentina's answers to the questionnaire that I am circulating to the whole group.

Best regards,

Elise Delaitre

(b)(1)

[redacted]

(b)(1)

[redacted]

Objet : RE: [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear colleagues,

Please find attached China and Japan's answers to the questionnaires. We thank them for their contributions and for letting us circulate their questionnaire to the whole group.

Best regards,

Elise Delaître
Ministry of Economy and Finance - France

(b)(1)

[redacted]

Importance : Haute

Dear co-chairs and colleagues,

Please find attached Italy's response to the questionnaire on climate finance.
We would like to thank the co-chairs for their efforts in progressing this work.

Best regards
Gisella Berardi

Gisella Berardi
Dipartimento del Tesoro - Ministero dell'Economia e delle Finanze
Direzione III – Rapporti Finanziari Internazionali
Ufficio II – Coordinamento G8/G20
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e-Mail: (b)(6) @tesoro.it<(b)(6) @tesoro.it>
Web: www.dt.tesoro.it<http://www.dt.tesoro.it>

[Descrizione: Descrizione: Descrizione: cid:A0AF691F-EE9C-4838-9523-C9A691ABCC7B]

(b)(1)

(b)(1)

[redacted]

Subject: TR: Climate Finance Study Group Meeting, September 23rd, Mexico City

On behalf of Cleo Rose Innes and Delphine d'Amarzit:

Dear members of the G20 climate finance study group,

We recirculate the logistical and administrative information for the first face to face meeting of the G20 climate finance study group (CFSG) sent by the Mexican presidency, with an updated and hopefully complete list of diffusion.

In order to respect the very short timeframe that will lead us to the November Ministerial meeting, we previously asked all members that their answers and additional contributions (if any) be sent at the very latest before September 19, COB (see TORs and questionnaire re-attached for your convenience). But, in order to allow these information to be compiled and to properly feed our face-to-face discussion in Mexico, we would really appreciate if you could make all possible diligence to provide us with all or part of your answers ahead of this deadline.
We are looking forward to seeing you all in Mexico,

Best regards,

Cleo and Delphine

(b)(1)

(b)(1)

[redacted]

Objet : Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear Members of the Climate Finance Study Group,

Below you can find the logistical and administrative information for the first face to face meeting of the Climate Finance Study Group (CFSG) this coming September 23rd in Mexico City from 8:00 hrs to 15:00 hrs. If you have questions on logistics please contact Alejandro Hernández (b)(1) hacienda.gob.mx<(b)(1) hacienda.gob.mx> from the Ministry of Finance in Mexico.

MEETING OF THE G20 STUDY GROUP ON CLIMATE FINANCE
AGENDA
23 September 2012

8:00 – 8:15 OPENING REMARKS

8:15-9:15 CONTEXT FOR WORK OF STUDY GROUP

9:30-11:30 WORKING SESSION 1

11:30-12:15 Break

12:15-14:15 WORKING SESSION 2

14:15- 15:00 CLOSING REMARKS AND WAY FORWARD

MEETING OF THE G20 STUDY GROUP ON CLIMATE FINANCE
ADMNISITRATIVE INFORMATION

1. ADMINISTRATIVE CIRCULAR: Please find attached the Administrative Circular with all the relevant information regarding the G20 events taking place in Mexico City the 21-24 September. This includes a specific annex with the information related to the Climate Finance Study Group Meeting on the 23rd, as well as important information regarding lodging and transportation.

2. REGISTRATION: You can already register to the Climate Finance Study Group Meeting on the following link:

https://g20mx.sharepoint.com/SepMeeting/add/Lists/AddAtendees/AddEvNew.aspx

with the following username: G20sept@banxico.org.mx<mailto:G20sept@banxico.org.mx> and password: G20Event092012

The username and password are for personal use. Please do not forward this information, as they will allow you to enter to the National Palace premises, that are guarded 24/7. Due to the fact that the meeting will take place at the National Palace, all delegates must have their passport with them at all times since it may be requested by National Palace security personnel.

NOTES: A few remarks regarding registration:

a. In the Administrative Circular there is a link regarding registration for the Deputies Meeting. PLEASE DO NOT REGISTRER at that link, since it is deemed for that single event, for deputies and accompanying delegates only. If you have already registered at this link because you will be attending more events, we ask you to re-register in the one provided above.

b. In order to register yourselves, please check the box “Climate Finance Study Group Meeting” at the end of the form, after filling your data in.

c. It is enough to click on the “save” button to finish your registration, the site won’t confirm your registration immediately. You will receive a confirmation mail afterwards.

d. Your registration has to be filled in a single session, you cannot save your data and come back later.

3. ADDITIONAL EVENTS: Among the events to be held on the margins of the Deputies Meeting there is the “Seminar on Challenges and Opportunities of the Global Economy” which will have as speakers academics, and economists from the OIs and finance ministries. The members of this Study Group are welcomed to attend, if you wish to do so please check the corresponding box (Seminar on Challenges and Opportunities of the Global Economy) at the in the registration form as well. A draft program is attached for your convenience.

Participants of the seminar:
- Peter A. Diamond, Institute Professor MIT, 2010 Nobel Laureate
- José Antonio Meade, Minister of Finance, Mexico

- Agustín Carstens Carstens, Governor of Banco de Mexico
- Gerardo Rodríguez, Deputy Minister of Finance, Mexico
- Manuel Ramos Francia, Deputy Governor, Banco de México
- David Backus, Heinz Riehl Professor, Stern School of Business, NYU
- Aaron Tornell, Professor of Economics, University of California, Los Angeles
- Íñigo Fernández, Treasury Secretary General, Spain
- Sebastian Galiani, Professor of Economics, University of Maryland
- Mario Marcel, Deputy Director of the Public Governance and Territorial Development Directorate, OECD
- Martin Ravallion, Senior Vice President Development Economics, World Bank
- Gonzalo Hernández Licona, Executive Secretary, CONEVAL
- Harald Uhlig, Chairman of the Department of Economics, The University of Chicago
- Laurence J. Kotlikoff, William Fairfield Warren Distinguished Professor, Boston University
- Alan Auerbach, Robert D. Burch Professor of Economics and Law, University of California, Berkeley
- Carlo Cottarelli, Director of the Fiscal Affairs Department, IMF
- Carlo Monticelli, Head of International Financial Relations, Treasury Department, Ministry of Economy and Finance, Italy
- Pier Carlo Padoan, Deputy Secretary-General and Chief Economist of the OECD
- Timothy Kehoe, Professor of Economics, University of Minnesota
- Lungisa Fuzile, Director-General of the National Treasury, South Africa

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

INTRODUCTION

The study group will report to G20 Finance Ministers on the state of discussion among members on ways to effectively mobilize resources for Climate Finance.

Among other analysis on which the work of the group can build upon are two reports already presented to G20 Finance Ministers but not yet discussed in significant detail. These are: *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers* (IFI Report to the G20) in 2011; and the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing* (AGF Report) in 2010. The AGF report provided an overview of a number of potential sources and the IFI report to the G20 elaborated on these providing additional details on the economic and financial rationale of the potential sources, their incidence and some issues to be dealt with for implementation.

The purpose of this Questionnaire is to initiate the work of the study group, by fostering an exchange views on options outlined in the aforementioned reports, as well as other options or potential issues not yet explored. The Questionnaire provides a tentative framework to organize the discussion, while leaving G20 members participating to the study group with all freedom to express their views on these and any other subject they judge adequate in the frame of the group and providing any additional appropriate information to feed the discussion.

QUESTIONS

ISSUE 1: Potential of sources identified and other sources to consider

Developed countries have committed, *"in the context of meaningful mitigation actions and transparency on implementation, to a goal of jointly mobilizing US$100bn per year by 2020 to address the needs of developing countries*". This funding will come from a variety of sources.

- *Do you consider that the variety of potential sources tackled by the IFI Report to the G20 could in principle bring sufficient revenues and predictable enough flows of finance to the fight against climate change and to reach in particular the goal of mobilizing $100bn a year?*
- *What other additional sources should the G20 also consider? For each of these sources, what measures would be required to mobilize them and what are the impediments, consequences and advantages of these measures? What could be the role of the G20 to move forward in this respect?*

U.S. RESPONSE:

The Report *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers* looked at a wide variety of sources for climate finance. A combination of these options could reach the goal of mobilizing $100bn a year by 2020, in the context of meaningful mitigation actions by developing countries and transparency on their implementation.

However, the acceptability of new sources will depend on national circumstances. There can be no uniform prescription for mobilizing the sources and instruments of climate finance as described in the Report to the G20 on *Mobilizing Climate Finance*.

ISSUE 2: Carbon Pricing Instruments

Carbon pricing policies through taxes or emission trading schemes have been pilot-tested however not universally adopted for a number of reasons.

- *For countries that have not implemented carbon pricing policies, what are the major impediments for introducing such a policy and what can be done to overcome them?*
- *For countries with carbon pricing policies, would you consider it desirable to extend domestic carbon pricing policies (taxes or emission trading schemes) to more sectors in your own country and/or to more countries? What would be the impediments to doing this?*
- *What adverse outcomes can be foreseen and how could they be dealt with?*
- *What are the comparative advantages of specific sector carbon tax proposals and broader tax on domestic sources?*
- *To what extent could expected revenues be directed to international climate finance?*
- *What could be in your view the role of the G20, if any, in terms of a shared approach to carbon pricing policies?*

U.S. RESPONSE:

Over the years, there have been a number of legislative proposals to enact a carbon pricing policy at a federal level in the United States. Such legislation would have to be passed by both the United States House of Representatives and the United States Senate, and then signed by the President of the United States. In 2009, the House of Representatives passed the American Clean Energy and Security Act of 2009, which would have established carbon pricing at a federal level. However, the Senate did not subsequently pass comparable legislation. A variety of factors are likely contributing to the fact that such legislation has not been enacted to date, and we cannot speculate on the range of these factors.

A significant body of literature has emerged evaluating the distributional effects of carbon pricing and opportunities to address those effects through the targeted use of revenue from carbon pricing, or the targeted use of the value of emission allowances that would be created if a cap-and-trade system were enacted.[1] Another commonly discussed issue is the

[1] For one summary of elements of this literature, see U.S. Congressional Budget Office, *The Distributional Consequences of a Cap-and-Trade Program for CO2 Emissions*, Statement of Terry M. Dinan (Senior Advisor) before the Subcommittee on Income Security and Family Support Committee on Ways and Means, U.S. House of Representatives, March 12, 2009. Available at

potential for unilateral carbon pricing to lead to "leakage," whereby unilateral domestic carbon pricing can lead to a shift in certain emissions overseas as a result of increases in the relative cost of domestic production of energy-intensive internationally-traded goods, relative to production in countries not implementing carbon pricing. Again, a substantial literature has emerged on this issue and means of addressing it.[2] While certain distributional consequences and leakage are two commonly cited issues that could become adverse consequences of carbon pricing if they are not appropriately addressed, this is not meant to be an exhaustive list. In the case of any carbon pricing policy that might be proposed, careful consideration would need to be given to the specifics of the proposal and its potential effects.

In conducting environmental policy analyses, three commonly considered criteria for evaluating alternative policy designs are: environmental effectiveness, economic efficiency, and distributional consequences. Any analysis of alternative policy designs would require careful consideration of the specific facts of and circumstances surrounding each policy proposal. However, holding constant the level of a proposed carbon price, it is generally the case that more narrowly targeted carbon pricing proposals are less environmentally effective (i.e., they achieve fewer emission reductions), and less economically efficient (i.e., broader application of carbon pricing can achieve the same level of emission reductions at lower cost). Yet, again holding constant the level of the carbon price, more narrowly targeted carbon pricing will have more limited distributional consequences.

There are many potential competing uses of any revenues that may be created by a carbon pricing proposal. Past legislative proposals have directed such revenue to a wide variety of uses, including (but potentially not limited to): mitigating distributional consequences, funding related or other domestic policy initiatives, deficit reduction, and international climate finance. As with any other revenue source, carbon pricing revenues collected by national governments should be disbursed according to their standard budgetary procedures. It is difficult to predict what share of revenues would go to each of these potential uses, including international climate finance, in any legislation that might be enacted.

Finance ministries in the G20 can exchange experiences and best practices in implementing carbon pricing policies.

ISSUE 3: Charges to mitigate emissions in international aviation and maritime transportation

The IFI Report to the G20 considers that this modality may have very significant financing and mitigation potential.

http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/100xx/doc10018/03-12-climatechange_testimony.pdf.

[2] For one U.S. Government analysis of issues surrounding leakage and of the provisions in particular proposed legislation to address this issue, see *The Effects of H.R. 2454 on International Competitiveness and Emission Leakage in Energy-Intensive Trade-Exposed Industries*, December 2, 2009. Available at: http://www.epa.gov/climatechange/Downloads/EPAactivities/InteragencyReport_Competitiveness-EmissionLeakage.pdf.

- *What could be the difficulties and adverse consequences to the implementation of such measures and what would be the ways to overcome them? In particular, could adequate compensation mechanisms be designed to prevent negative impacts on developing countries?*
- *Should such measures be implemented, to what extent could expected revenues be directed to international climate finance? What should be in this case the potential role of national tax agencies/authorities in the collection and disbursement of the bunkers revenues?*
- *What could be in your view the role of the G20 in advancing the common understanding around such instruments, in relation with other appropriate fora?*

U.S. RESPONSE:

Market-based instruments (MBIs) can under the right circumstances be effective tools to address emissions. The implementation of market-based instruments for international aviation and maritime transport faces significant challenges, however, that must be addressed.

For many reasons, the United States believes that mechanisms that attempt to compensate developing countries or entities within them for the specific impacts of an MBI are unlikely to be workable or consistent with longstanding IMO and ICAO principles.

National tax authorities have significant experience with administering a variety of excise tax systems, suggesting that it may be logical to have them administer the collection of any revenues. At a minimum, any MBI should include a mechanism that would allow national authorities to collect revenues for those countries, like the United States, that prefer to maintain sovereign authority over tax collection and administration within its borders and for its citizens. Similarly, MBI revenues collected by national governments should be disbursed according to their standard budgetary procedures (as for any other revenues). It is difficult to predict the extent to which governments would choose to direct revenues from an aviation or maritime MBI to climate finance.

Both the IMO and ICAO have unparalleled technical expertise in their respective sectors and comprise the various governments that will be needed to negotiate and agree on the principles and practices for an MBI for the international maritime and aviation sectors, respectively. IMO and ICAO should, therefore, be the venue for such negotiations and lead on any analysis that is done to understand the impacts of an MBI. The G-20 could support the ongoing work on MBIs at these organizations by ensuring that these organizations are given the lead on any future work that is requested or conducted on MBIs and by building political momentum among G-20 countries for continued progress within these organizations.

ISSUE 4: Fossil fuel subsidy reforms

G20 members have committed to "*rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption over the medium term while providing targeted*

support to the poorest"[3]. Tracking progress towards this objective is work undertaken within the G20 Energy Working Group.

- *To what extent could revenues saved by country governments in phasing out such subsidies be directed to climate finance?*

U.S. RESPONSE:

Removal of inefficient fossil fuel subsidies will not only encourage energy conservation, improve our energy security, and help reduce greenhouse gas emissions, but will also reduce wasteful spending. As with any other revenue source, the funds saved through elimination of fossil fuel subsidies should be disbursed by national governments according to their standard budgetary procedures. Governments could choose to use a portion of the budgetary savings from removing fossil fuel subsidies for climate finance. At the same time, as has been discussed in the G20 Energy Working Group, governments may also choose to use a portion of these savings to implement targeted support measures to mitigate the impact of subsidy removal on the poorest. Governments may also choose to use a portion of savings to pursue other objectives, including those that fossil fuel subsidies may have been intended to accomplish (for example, enhancing energy security through support for renewable energy technologies). In light of these considerations, it is difficult to predict the extent to which governments would choose to direct budgetary savings from removing subsidies to climate finance.

ISSUE 5: Carbon Markets

While the global institutional context is currently subject to uncertainties, carbon markets, including offsetting mechanisms such as the Clean Development Mechanism (CDM) are promising instruments.

- *Are carbon markets, including offsetting mechanisms, a promising way to mobilize private flows? What could be done to deal with the challenges and short term concerns such as the volatility and low price of carbon credits and what could be learnt from countries that have dealt with these challenges?*
- *What could the G20 expect from the UNFCCC and other fora to enhance this instrument and what could be its own role?*

U.S. RESPONSE:

Carbon markets are expected to play an important role in mobilizing and efficiently allocating private capital flows to mitigation opportunities. Experience shows that international offset mechanisms (such as the CDM) can promote technology transfer and scaled-up private sector finance. This experience can inform the development of robust market mechanisms.

[3] Paragraph XXX

The degree of volatility and level of carbon price are partly determined by the design of policy, balancing a variety of considerations. To the extent that lower volatility is desired, there are well established policy mechanisms to reduce such volatility. To the extent that there is a desire to adjust the level of carbon pricing, that too can be influenced by policy design.

A wide range of countries, including both developed and developing countries as well as several G20 members, are gaining experience with design and implementation of national market-based approaches to address climate change and non-greenhouse gas pollutants. The Partnership for Market Readiness is an important forum at which information about these programs is exchanged, and the G20 may wish to draw upon its products.

The UNFCCC will be continuing to address market-based mechanisms as a cost-effective means by which to address GHG mitigation. The UNFCCC will be considering a framework for ensuring environmental integrity of market-based measures as well as the design of a new market-based mechanism building on experience in the UNFCCC and by individual countries.

ISSUE 6: Direct Budget Transfers and instruments to engage Private Finance

Direct budget transfers a key role in the mobilization of climate finance, responding to needs which private flows may address only imperfectly. Nevertheless, the dominant scale of global private capital markets suggest that the private sector will need to play a central role in the mobilization of climate finance in the long run. Public policy and finance play a crucial dual role by establishing the incentive frameworks needed to catalyze high levels of investment in mitigation and adaptation activities including by generating public resources that can be targeted at market failures and other barriers to private finance.

- *What are the crucial elements of an incentive framework needed to catalyze high levels of climate-related investments, including from private finance??*
- *What role could direct budget contributions play in that regard?*
- *How should countries that have made commitments to additional public financing cooperate to leverage most effectively private sector investment?*
- *What measures could be taken to ensure that private finance also address adaptation projects and also take into account country ownership and national development priorities of developing countries?*

U.S. RESPONSE:

Effectively addressing climate change will require significant involvement from the private sector, including investment in infrastructure and technology deployment. Private firms are key investors in climate-friendly technology. Private finance is a major source of capital for investment in greenhouse gas (GHG) mitigation and adaptation either as stand alone projects (renewable energy) or a feature of other projects – energy efficient building or equipment or incorporated into business practices (e.g., water use). The Climate Policy Initiative, in its 2011 report on "The Landscape of Climate Finance," estimated $37.0-72.2

billion dollars of annual flows from the private sector to developing countries, constituting the "largest component in today's climate finance landscape."[4]

Despite increased private sector investment in climate-friendly projects, barriers to investment remain. Such barriers include those commonly associated with investing in infrastructure—such as cost of capital as well as currency, political, legal, regulatory, and counterparty risks—and those unique to investing in low-carbon solutions, including the incremental cost gap between some low-carbon and conventional technologies and a lack of a proven track record for some new mitigation and adaptation technologies and business models.

Leveraging private finance through the careful, targeted use of public finance tools can be an effective way to incentivize transformational change. Coordinated action by the public sector, with leadership from finance ministries and development finance institutions, is critical to addressing the barriers described above and attracting higher levels of private investment, in both climate mitigation and adaptation. For example, finance ministries can promote green investment policies that crowd in the private sector by addressing directly the market failures leading to greenhouse gas emissions greater than the socially optimum level. Development finance institutions can invest in risk mitigation, provide technical advisory services, and finance demonstration and deployment of new technologies and business models.

Any use of public money must come with appropriate accountability measures and safeguards. To be most effective, investments and investment policies should be coherent with country development strategies.

Finally, finance ministries should also seek opportunities to identify and phase out inefficient policies that promote non-green investment at the expense of green investment, including fossil fuel subsidies. Reforms implemented by some countries in the G20 demonstrate that it is possible to make choices that may be politically difficult now, but will provide clear long-term benefits.

ISSUE 7: MDB resources

The *MDBs* also play a key role in leveraging financing flows, by using instruments such as loans, guarantees, grants or equity.

- *What role could MDB resources play with respect to climate finance?*
- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*

U.S. RESPONSE:

[4] http://climatepolicyinitiative.org/publication/the-landscape-of-climate-finance/ See pp 21-24.

MDBs are already playing a significant role in climate finance. For example, over the past five years, the IFC has doubled its investments in climate-friendly projects to $1.7 billion per year, with a goal to increase its climate business to 20% of its long-term financing by 2015. EBRD invested EUR 8 billion between 2006 and 2011 and has a target of 25% of its annual investment volume going toward climate related projects. The World Bank reported over $6 billion committed from internal resources in 2011 for climate mitigation alone. Other MDBs have similarly scaled up their climate financing.[5]

Climate-friendly projects frequently make both financial and development sense, and therefore do not conflict with MDBs' mandates in these areas. For example, earlier this year eight MDBs pledged a $175 billion voluntary commitment to financing sustainable transportation over the next decade. This financing will promote inclusive economic development while also protecting the environment.

Where projects require some incremental or concessional financing for environmental protection – for example to demonstrate and deploy new technologies and business models, or to help the poorest countries adapt to climate change – funds like the Global Environment Facility and Climate Investment Funds are available to help bring these projects to fruition by supplementing MDB resources.

One example of how concessional funds have been used in conjunction with MDB resources to leverage private finance for market development is how the Clean Technology Fund (CTF) has been implemented in Mexico. As part of the implementation of the CTF investment plan, in May 2009, the CTF provided $15.6 million of concessional finance for a $187 million private sector wind development project. The project was designed to demonstrate the commercial viability of private wind projects in Mexico. In 2010, the first sub-project, a 67.5 MW wind farm developed by EDF Energies Nouvelles, received financing from CTF in conjunction with IFC, IDB and the U.S. Export-Import Bank.[6]

A second project, a 250 MW wind farm developed by Acciona Energia, also received support from CTF in order to fill the gap between senior lenders' risk perceptions and what sponsors needed to receive an acceptable return.

In February 2012, Macquarie announced the completion of financing for a 396 MW, $700 million wind energy project in Oaxaca that did not use CTF funds. It is estimated that in 2012 Mexico will have 2GW of wind capacity, over 20 times what it did in 2008.[7]

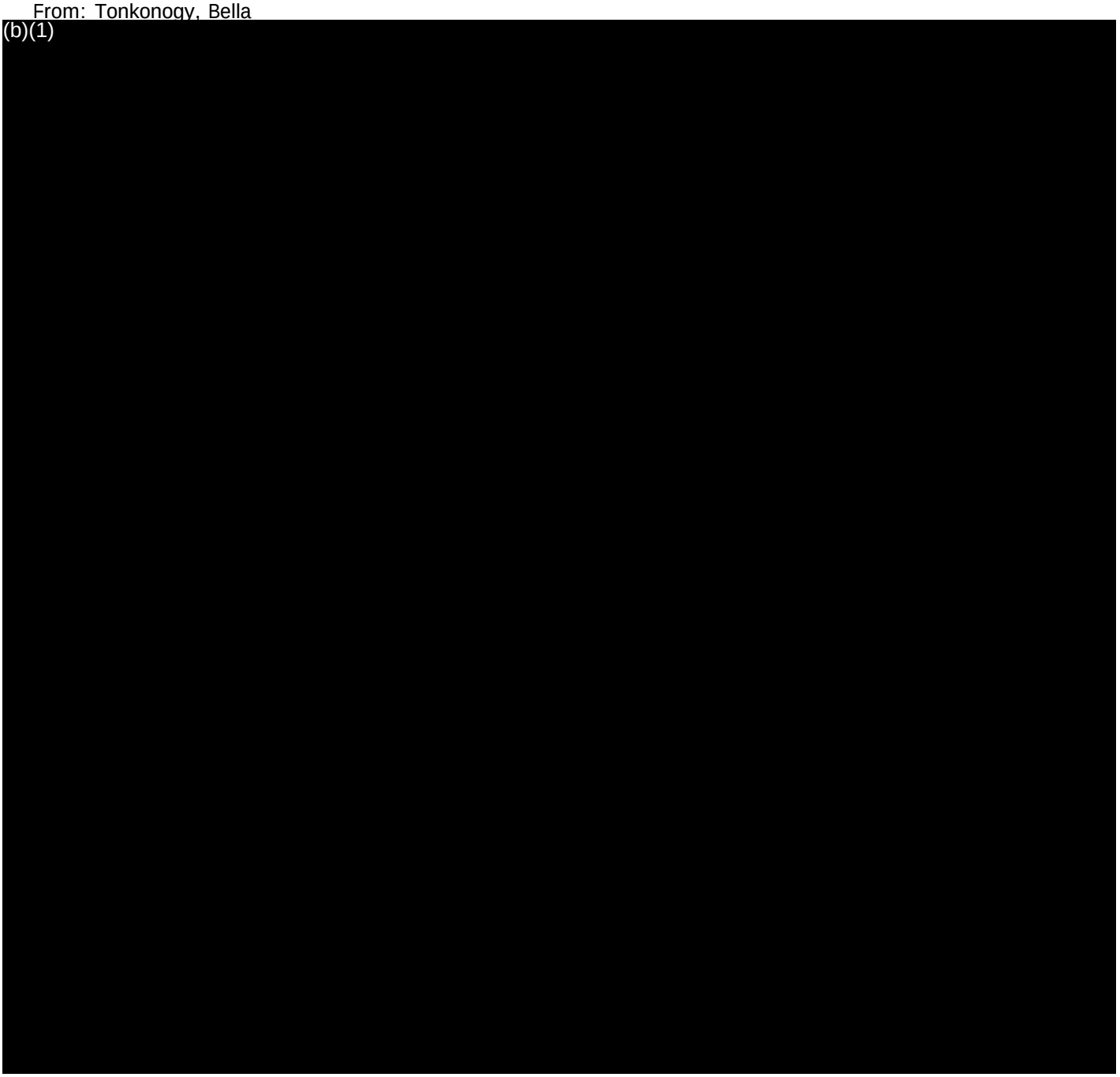
[5] See, e.g., Joint MDB Report on Mitigation Finance 2011, http://climatechange.worldbank.org/sites/default/files/MMF_2011_version_21.pdf
[6] http://www.clipperwind.com/pr_080508.html
[7] CTF PAD

From: Metcalf, Gilbert
To: (b) (6) @tufts.edu"
Subject: Fw: [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City
Date: Sunday, September 23, 2012 6:43:54 AM
Attachments: CFSG Questionnaire_US Response.docx

Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Tonkonogy, Bella

(b)(1)



(b)(1)

Subject: RE: [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City

On behalf of Gib Metcalf

Dear colleagues-
Attached please find the US responses to the questionnaire.

_____
Bella Tonkonogy
US Department of the Treasury

(b)(1)

(b)(1)

[redacted]

Subject: RE : [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear all,

please find attached mexico's answers to the questionnaire that I am circulating to all of you.

Best,

Elise

(b)(1)

[redacted]

(b)(1)

[redacted]

Objet : RE : [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear all,

please find attadched Argentina's answers to the questionnaire that I am circulating to the whole group.

Best regards,

Elise Delaitre

(b)(1)

[redacted]

(b)(1)

Objet : RE: [UNCLASSIFIED] RE: Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear colleagues,

Please find attached China and Japan's answers to the questionnaires. We thank them for their contributions and for letting us circulate their questionnaire to the whole group.

Best regards,

Elise Delaître
Ministry of Economy and Finance - France

(b)(1)

Importance : Haute

Dear co-chairs and colleagues,

Please find attached Italy's response to the questionnaire on climate finance.
We would like to thank the co-chairs for their efforts in progressing this work.

Best regards
Gisella Berardi

Gisella Berardi
Dipartimento del Tesoro - Ministero dell'Economia e delle Finanze
Direzione III – Rapporti Finanziari Internazionali
Ufficio II – Coordinamento G8/G20
Sede: Via XX Settembre, 97 – 00187 Roma
Tel. (b) (6)
Fax +39 06.4761.6594
e-Mail: (b) (6) @tesoro.it<(b) (6) .berardi@tesoro.it>
Web: www.dt.tesoro.it<http://www.dt.tesoro.it>

[Descrizione: Descrizione: Descrizione: cid:A0AF691F-EE9C-4838-9523-C9A691ABCC7B]

(b)(1)

(b)(1)

[redacted]

Subject: TR: Climate Finance Study Group Meeting, September 23rd, Mexico City

On behalf of Cleo Rose Innes and Delphine d'Amarzit:

Dear members of the G20 climate finance study group,

We recirculate the logistical and administrative information for the first face to face meeting of the G20 climate finance study group (CFSG) sent by the Mexican presidency, with an updated and hopefully complete list of diffusion.

In order to respect the very short timeframe that will lead us to the November Ministerial meeting, we previously asked all members that their answers and additional contributions (if any) be sent at the very latest before September 19, COB (see TORs and questionnaire re-attached for your convenience). But, in order to allow these information to be compiled and to properly feed our face-to-face discussion in Mexico, we would really appreciate if you could make all possible diligence to provide us with all or part of your answers ahead of this deadline.
We are looking forward to seeing you all in Mexico,

Best regards,

Cleo and Delphine

(b)(1)

(b)(1)

Objet : Climate Finance Study Group Meeting, September 23rd, Mexico City

Dear Members of the Climate Finance Study Group,

Below you can find the logistical and administrative information for the first face to face meeting of the Climate Finance Study Group (CFSG) this coming September 23rd in Mexico City from 8:00 hrs to 15:00 hrs. If you have questions on logistics please contact Alejandro Hernández (b)(1) acienda.gob.mx(b)(1) hacienda.gob.mx> from the Ministry of Finance in Mexico.

MEETING OF THE G20 STUDY GROUP ON CLIMATE FINANCE
AGENDA
23 September 2012

8:00 – 8:15 OPENING REMARKS

8:15-9:15 CONTEXT FOR WORK OF STUDY GROUP

9:30-11:30 WORKING SESSION 1

11:30-12:15 Break

12:15-14:15 WORKING SESSION 2

14:15- 15:00 CLOSING REMARKS AND WAY FORWARD

MEETING OF THE G20 STUDY GROUP ON CLIMATE FINANCE
ADMNISITRATIVE INFORMATION

1. ADMINISTRATIVE CIRCULAR: Please find attached the Administrative Circular with all the relevant information regarding the G20 events taking place in Mexico City the 21-24 September. This includes a specific annex with the information related to the Climate Finance Study Group Meeting on the 23rd, as well as important information regarding lodging and transportation.

2. REGISTRATION: You can already register to the Climate Finance Study Group Meeting on the following link:

https://g20mx.sharepoint.com/SepMeeting/add/Lists/AddAtendees/AddEvNew.aspx

with the following username: G20sept@banxico.org.mx<mailto:G20sept@banxico.org.mx> and password: G20Event092012

The username and password are for personal use. Please do not forward this information, as they will allow you to enter to the National Palace premises, that are guarded 24/7. Due to the fact that the meeting will take place at the National Palace, all delegates must have their passport with them at all times since it may be requested by National Palace security personnel.

NOTES: A few remarks regarding registration:

a. In the Administrative Circular there is a link regarding registration for the Deputies Meeting. PLEASE DO NOT REGISTRER at that link, since it is deemed for that single event, for deputies and accompanying delegates only. If you have already registered at this link because you will be attending more events, we ask you to re-register in the one provided above.

b. In order to register yourselves, please check the box “Climate Finance Study Group Meeting” at the end of the form, after filling your data in.

c. It is enough to click on the “save” button to finish your registration, the site won’t confirm your registration immediately. You will receive a confirmation mail afterwards.

d. Your registration has to be filled in a single session, you cannot save your data and come back later.

3. ADDITIONAL EVENTS: Among the events to be held on the margins of the Deputies Meeting there is the “Seminar on Challenges and Opportunities of the Global Economy” which will have as speakers academics, and economists from the OIs and finance ministries. The members of this Study Group are welcomed to attend, if you wish to do so please check the corresponding box (Seminar on Challenges and Opportunities of the Global Economy) at the in the registration form as well. A draft program is attached for your convenience.

Participants of the seminar:
- Peter A. Diamond, Institute Professor MIT, 2010 Nobel Laureate
- José Antonio Meade, Minister of Finance, Mexico

- Agustín Carstens Carstens, Governor of Banco de Mexico
- Gerardo Rodríguez, Deputy Minister of Finance, Mexico
- Manuel Ramos Francia, Deputy Governor, Banco de México
- David Backus, Heinz Riehl Professor, Stern School of Business, NYU
- Aaron Tornell, Professor of Economics, University of California, Los Angeles
- Íñigo Fernández, Treasury Secretary General, Spain
- Sebastian Galiani, Professor of Economics, University of Maryland
- Mario Marcel, Deputy Director of the Public Governance and Territorial Development Directorate, OECD
- Martin Ravallion, Senior Vice President Development Economics, World Bank
- Gonzalo Hernández Licona, Executive Secretary, CONEVAL
- Harald Uhlig, Chairman of the Department of Economics, The University of Chicago
- Laurence J. Kotlikoff, William Fairfield Warren Distinguished Professor, Boston University
- Alan Auerbach, Robert D. Burch Professor of Economics and Law, University of California, Berkeley
- Carlo Cottarelli, Director of the Fiscal Affairs Department, IMF
- Carlo Monticelli, Head of International Financial Relations, Treasury Department, Ministry of Economy and Finance, Italy
- Pier Carlo Padoan, Deputy Secretary-General and Chief Economist of the OECD
- Timothy Kehoe, Professor of Economics, University of Minnesota
- Lungisa Fuzile, Director-General of the National Treasury, South Africa

G20 STUDY GROUP ON CLIMATE FINANCE
QUESTIONNAIRE

Revised 5 September 2012

INTRODUCTION

The study group will report to G20 Finance Ministers on the state of discussion among members on ways to effectively mobilize resources for Climate Finance.

Among other analysis on which the work of the group can build upon are two reports already presented to G20 Finance Ministers but not yet discussed in significant detail. These are: *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers* (IFI Report to the G20) in 2011; and the *Report of the Secretary General's High Level Advisory Group on Climate Change Financing* (AGF Report) in 2010. The AGF report provided an overview of a number of potential sources and the IFI report to the G20 elaborated on these providing additional details on the economic and financial rationale of the potential sources, their incidence and some issues to be dealt with for implementation.

The purpose of this Questionnaire is to initiate the work of the study group, by fostering an exchange views on options outlined in the aforementioned reports, as well as other options or potential issues not yet explored. The Questionnaire provides a tentative framework to organize the discussion, while leaving G20 members participating to the study group with all freedom to express their views on these and any other subject they judge adequate in the frame of the group and providing any additional appropriate information to feed the discussion.

QUESTIONS

ISSUE 1: Potential of sources identified and other sources to consider

Developed countries have committed, *"in the context of meaningful mitigation actions and transparency on implementation, to a goal of jointly mobilizing US$100bn per year by 2020 to address the needs of developing countries*". This funding will come from a variety of sources.

- *Do you consider that the variety of potential sources tackled by the IFI Report to the G20 could in principle bring sufficient revenues and predictable enough flows of finance to the fight against climate change and to reach in particular the goal of mobilizing $100bn a year?*
- *What other additional sources should the G20 also consider? For each of these sources, what measures would be required to mobilize them and what are the impediments, consequences and advantages of these measures? What could be the role of the G20 to move forward in this respect?*

U.S. RESPONSE:

The Report *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers* looked at a wide variety of sources for climate finance. A combination of these options could reach the goal of mobilizing $100bn a year by 2020, in the context of meaningful mitigation actions by developing countries and transparency on their implementation.

However, the acceptability of new sources will depend on national circumstances. There can be no uniform prescription for mobilizing the sources and instruments of climate finance as described in the Report to the G20 on *Mobilizing Climate Finance*.

ISSUE 2: Carbon Pricing Instruments

Carbon pricing policies through taxes or emission trading schemes have been pilot-tested however not universally adopted for a number of reasons.

- *For countries that have not implemented carbon pricing policies, what are the major impediments for introducing such a policy and what can be done to overcome them?*
- *For countries with carbon pricing policies, would you consider it desirable to extend domestic carbon pricing policies (taxes or emission trading schemes) to more sectors in your own country and/or to more countries? What would be the impediments to doing this?*
- *What adverse outcomes can be foreseen and how could they be dealt with?*
- *What are the comparative advantages of specific sector carbon tax proposals and broader tax on domestic sources?*
- *To what extent could expected revenues be directed to international climate finance?*
- *What could be in your view the role of the G20, if any, in terms of a shared approach to carbon pricing policies?*

U.S. RESPONSE:

Over the years, there have been a number of legislative proposals to enact a carbon pricing policy at a federal level in the United States. Such legislation would have to be passed by both the United States House of Representatives and the United States Senate, and then signed by the President of the United States. In 2009, the House of Representatives passed the American Clean Energy and Security Act of 2009, which would have established carbon pricing at a federal level. However, the Senate did not subsequently pass comparable legislation. A variety of factors are likely contributing to the fact that such legislation has not been enacted to date, and we cannot speculate on the range of these factors.

A significant body of literature has emerged evaluating the distributional effects of carbon pricing and opportunities to address those effects through the targeted use of revenue from carbon pricing, or the targeted use of the value of emission allowances that would be created if a cap-and-trade system were enacted.[1] Another commonly discussed issue is the

[1] For one summary of elements of this literature, see U.S. Congressional Budget Office, *The Distributional Consequences of a Cap-and-Trade Program for CO2 Emissions*, Statement of Terry M. Dinan (Senior Advisor) before the Subcommittee on Income Security and Family Support Committee on Ways and Means, U.S. House of Representatives, March 12, 2009. Available at

potential for unilateral carbon pricing to lead to "leakage," whereby unilateral domestic carbon pricing can lead to a shift in certain emissions overseas as a result of increases in the relative cost of domestic production of energy-intensive internationally-traded goods, relative to production in countries not implementing carbon pricing. Again, a substantial literature has emerged on this issue and means of addressing it.[2] While certain distributional consequences and leakage are two commonly cited issues that could become adverse consequences of carbon pricing if they are not appropriately addressed, this is not meant to be an exhaustive list. In the case of any carbon pricing policy that might be proposed, careful consideration would need to be given to the specifics of the proposal and its potential effects.

In conducting environmental policy analyses, three commonly considered criteria for evaluating alternative policy designs are: environmental effectiveness, economic efficiency, and distributional consequences. Any analysis of alternative policy designs would require careful consideration of the specific facts of and circumstances surrounding each policy proposal. However, holding constant the level of a proposed carbon price, it is generally the case that more narrowly targeted carbon pricing proposals are less environmentally effective (i.e., they achieve fewer emission reductions), and less economically efficient (i.e., broader application of carbon pricing can achieve the same level of emission reductions at lower cost). Yet, again holding constant the level of the carbon price, more narrowly targeted carbon pricing will have more limited distributional consequences.

There are many potential competing uses of any revenues that may be created by a carbon pricing proposal. Past legislative proposals have directed such revenue to a wide variety of uses, including (but potentially not limited to): mitigating distributional consequences, funding related or other domestic policy initiatives, deficit reduction, and international climate finance. As with any other revenue source, carbon pricing revenues collected by national governments should be disbursed according to their standard budgetary procedures. It is difficult to predict what share of revenues would go to each of these potential uses, including international climate finance, in any legislation that might be enacted.

Finance ministries in the G20 can exchange experiences and best practices in implementing carbon pricing policies.

ISSUE 3: Charges to mitigate emissions in international aviation and maritime transportation

The IFI Report to the G20 considers that this modality may have very significant financing and mitigation potential.

http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/100xx/doc10018/03-12-climatechange_testimony.pdf.

[2] For one U.S. Government analysis of issues surrounding leakage and of the provisions in particular proposed legislation to address this issue, see *The Effects of H.R. 2454 on International Competitiveness and Emission Leakage in Energy-Intensive Trade-Exposed Industries*, December 2, 2009. Available at: http://www.epa.gov/climatechange/Downloads/EPAactivities/InteragencyReport_Competitiveness-EmissionLeakage.pdf.

- *What could be the difficulties and adverse consequences to the implementation of such measures and what would be the ways to overcome them? In particular, could adequate compensation mechanisms be designed to prevent negative impacts on developing countries?*
- *Should such measures be implemented, to what extent could expected revenues be directed to international climate finance? What should be in this case the potential role of national tax agencies/authorities in the collection and disbursement of the bunkers revenues?*
- *What could be in your view the role of the G20 in advancing the common understanding around such instruments, in relation with other appropriate fora?*

U.S. RESPONSE:

Market-based instruments (MBIs) can under the right circumstances be effective tools to address emissions. The implementation of market-based instruments for international aviation and maritime transport faces significant challenges, however, that must be addressed.

For many reasons, the United States believes that mechanisms that attempt to compensate developing countries or entities within them for the specific impacts of an MBI are unlikely to be workable or consistent with longstanding IMO and ICAO principles.

National tax authorities have significant experience with administering a variety of excise tax systems, suggesting that it may be logical to have them administer the collection of any revenues. At a minimum, any MBI should include a mechanism that would allow national authorities to collect revenues for those countries, like the United States, that prefer to maintain sovereign authority over tax collection and administration within its borders and for its citizens. Similarly, MBI revenues collected by national governments should be disbursed according to their standard budgetary procedures (as for any other revenues). It is difficult to predict the extent to which governments would choose to direct revenues from an aviation or maritime MBI to climate finance.

Both the IMO and ICAO have unparalleled technical expertise in their respective sectors and comprise the various governments that will be needed to negotiate and agree on the principles and practices for an MBI for the international maritime and aviation sectors, respectively. IMO and ICAO should, therefore, be the venue for such negotiations and lead on any analysis that is done to understand the impacts of an MBI. The G-20 could support the ongoing work on MBIs at these organizations by ensuring that these organizations are given the lead on any future work that is requested or conducted on MBIs and by building political momentum among G-20 countries for continued progress within these organizations.

ISSUE 4: Fossil fuel subsidy reforms

G20 members have committed to "*rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption over the medium term while providing targeted*

support to the poorest"[3]. Tracking progress towards this objective is work undertaken within the G20 Energy Working Group.

- *To what extent could revenues saved by country governments in phasing out such subsidies be directed to climate finance?*

U.S. RESPONSE:

Removal of inefficient fossil fuel subsidies will not only encourage energy conservation, improve our energy security, and help reduce greenhouse gas emissions, but will also reduce wasteful spending. As with any other revenue source, the funds saved through elimination of fossil fuel subsidies should be disbursed by national governments according to their standard budgetary procedures. Governments could choose to use a portion of the budgetary savings from removing fossil fuel subsidies for climate finance. At the same time, as has been discussed in the G20 Energy Working Group, governments may also choose to use a portion of these savings to implement targeted support measures to mitigate the impact of subsidy removal on the poorest. Governments may also choose to use a portion of savings to pursue other objectives, including those that fossil fuel subsidies may have been intended to accomplish (for example, enhancing energy security through support for renewable energy technologies). In light of these considerations, it is difficult to predict the extent to which governments would choose to direct budgetary savings from removing subsidies to climate finance.

ISSUE 5: Carbon Markets

While the global institutional context is currently subject to uncertainties, carbon markets, including offsetting mechanisms such as the Clean Development Mechanism (CDM) are promising instruments.

- *Are carbon markets, including offsetting mechanisms, a promising way to mobilize private flows? What could be done to deal with the challenges and short term concerns such as the volatility and low price of carbon credits and what could be learnt from countries that have dealt with these challenges?*
- *What could the G20 expect from the UNFCCC and other fora to enhance this instrument and what could be its own role?*

U.S. RESPONSE:

Carbon markets are expected to play an important role in mobilizing and efficiently allocating private capital flows to mitigation opportunities. Experience shows that international offset mechanisms (such as the CDM) can promote technology transfer and scaled-up private sector finance. This experience can inform the development of robust market mechanisms.

[3] Paragraph XXX

The degree of volatility and level of carbon price are partly determined by the design of policy, balancing a variety of considerations. To the extent that lower volatility is desired, there are well established policy mechanisms to reduce such volatility. To the extent that there is a desire to adjust the level of carbon pricing, that too can be influenced by policy design.

A wide range of countries, including both developed and developing countries as well as several G20 members, are gaining experience with design and implementation of national market-based approaches to address climate change and non-greenhouse gas pollutants. The Partnership for Market Readiness is an important forum at which information about these programs is exchanged, and the G20 may wish to draw upon its products.

The UNFCCC will be continuing to address market-based mechanisms as a cost-effective means by which to address GHG mitigation. The UNFCCC will be considering a framework for ensuring environmental integrity of market-based measures as well as the design of a new market-based mechanism building on experience in the UNFCCC and by individual countries.

ISSUE 6: Direct Budget Transfers and instruments to engage Private Finance

Direct budget transfers a key role in the mobilization of climate finance, responding to needs which private flows may address only imperfectly. Nevertheless, the dominant scale of global private capital markets suggest that the private sector will need to play a central role in the mobilization of climate finance in the long run. Public policy and finance play a crucial dual role by establishing the incentive frameworks needed to catalyze high levels of investment in mitigation and adaptation activities including by generating public resources that can be targeted at market failures and other barriers to private finance.

- *What are the crucial elements of an incentive framework needed to catalyze high levels of climate-related investments, including from private finance??*
- *What role could direct budget contributions play in that regard?*
- *How should countries that have made commitments to additional public financing cooperate to leverage most effectively private sector investment?*
- *What measures could be taken to ensure that private finance also address adaptation projects and also take into account country ownership and national development priorities of developing countries?*

U.S. RESPONSE:

Effectively addressing climate change will require significant involvement from the private sector, including investment in infrastructure and technology deployment. Private firms are key investors in climate-friendly technology. Private finance is a major source of capital for investment in greenhouse gas (GHG) mitigation and adaptation either as stand alone projects (renewable energy) or a feature of other projects – energy efficient building or equipment or incorporated into business practices (e.g., water use). The Climate Policy Initiative, in its 2011 report on "The Landscape of Climate Finance," estimated $37.0-72.2

billion dollars of annual flows from the private sector to developing countries, constituting the "largest component in today's climate finance landscape."[4]

Despite increased private sector investment in climate-friendly projects, barriers to investment remain. Such barriers include those commonly associated with investing in infrastructure—such as cost of capital as well as currency, political, legal, regulatory, and counterparty risks—and those unique to investing in low-carbon solutions, including the incremental cost gap between some low-carbon and conventional technologies and a lack of a proven track record for some new mitigation and adaptation technologies and business models.

Leveraging private finance through the careful, targeted use of public finance tools can be an effective way to incentivize transformational change. Coordinated action by the public sector, with leadership from finance ministries and development finance institutions, is critical to addressing the barriers described above and attracting higher levels of private investment, in both climate mitigation and adaptation. For example, finance ministries can promote green investment policies that crowd in the private sector by addressing directly the market failures leading to greenhouse gas emissions greater than the socially optimum level. Development finance institutions can invest in risk mitigation, provide technical advisory services, and finance demonstration and deployment of new technologies and business models.

Any use of public money must come with appropriate accountability measures and safeguards. To be most effective, investments and investment policies should be coherent with country development strategies.

Finally, finance ministries should also seek opportunities to identify and phase out inefficient policies that promote non-green investment at the expense of green investment, including fossil fuel subsidies. Reforms implemented by some countries in the G20 demonstrate that it is possible to make choices that may be politically difficult now, but will provide clear long-term benefits.

ISSUE 7: MDB resources

The *MDBs* also play a key role in leveraging financing flows, by using instruments such as loans, guarantees, grants or equity.

- *What role could MDB resources play with respect to climate finance?*
- *How in your view are MDB's mandates on development and poverty reduction and available funds affected by the effort to prioritize investment in mitigation and adaptation? What could be done to mitigate any of these potential negative effects?*

U.S. RESPONSE:

[4] http://climatepolicyinitiative.org/publication/the-landscape-of-climate-finance/ See pp 21-24.

MDBs are already playing a significant role in climate finance. For example, over the past five years, the IFC has doubled its investments in climate-friendly projects to $1.7 billion per year, with a goal to increase its climate business to 20% of its long-term financing by 2015. EBRD invested EUR 8 billion between 2006 and 2011 and has a target of 25% of its annual investment volume going toward climate related projects. The World Bank reported over $6 billion committed from internal resources in 2011 for climate mitigation alone. Other MDBs have similarly scaled up their climate financing.[5]

Climate-friendly projects frequently make both financial and development sense, and therefore do not conflict with MDBs' mandates in these areas. For example, earlier this year eight MDBs pledged a $175 billion voluntary commitment to financing sustainable transportation over the next decade. This financing will promote inclusive economic development while also protecting the environment.

Where projects require some incremental or concessional financing for environmental protection – for example to demonstrate and deploy new technologies and business models, or to help the poorest countries adapt to climate change – funds like the Global Environment Facility and Climate Investment Funds are available to help bring these projects to fruition by supplementing MDB resources.

One example of how concessional funds have been used in conjunction with MDB resources to leverage private finance for market development is how the Clean Technology Fund (CTF) has been implemented in Mexico. As part of the implementation of the CTF investment plan, in May 2009, the CTF provided $15.6 million of concessional finance for a $187 million private sector wind development project. The project was designed to demonstrate the commercial viability of private wind projects in Mexico. In 2010, the first sub-project, a 67.5 MW wind farm developed by EDF Energies Nouvelles, received financing from CTF in conjunction with IFC, IDB and the U.S. Export-Import Bank.[6]

A second project, a 250 MW wind farm developed by Acciona Energia, also received support from CTF in order to fill the gap between senior lenders' risk perceptions and what sponsors needed to receive an acceptable return.

In February 2012, Macquarie announced the completion of financing for a 396 MW, $700 million wind energy project in Oaxaca that did not use CTF funds. It is estimated that in 2012 Mexico will have 2GW of wind capacity, over 20 times what it did in 2008.[7]

[5] See, e.g., Joint MDB Report on Mitigation Finance 2011, http://climatechange.worldbank.org/sites/default/files/MMF_2011_version_21.pdf
[6] http://www.clipperwind.com/pr_080508.html
[7] CTF PAD

From: Baker, Jeffrey
To: Ambriz, Andrea; Douglass, Dora; Smart, Christopher
Cc: Jarpe, Rachel; Moghtader, Lailee; Le Bouder, Stephane; Fazili, Sameera
Subject: RE: Europe Talking Points TODAY 3pm
Date: Tuesday, January 31, 2012 5:11:52 PM
Attachments: NR [redacted].

Andrea -- Are you guys tracking down what if anything the members have said about Europe? For reference, we're focused on updating the attached, which was produced for Lael's HFAC briefing back in November.

Jeffrey K. Baker
Director
Office of Europe and Eurasia
U.S. Treasury Department
Tel: 202-622-4845
(b) (6) [redacted]

From: Ambriz, Andrea
Sent: Tuesday, January 31, 2012 5:08 PM
To: Douglass, Dora; Smart, Christopher; Baker, Jeffrey
Cc: Jarpe, Rachel; Moghtader, Lailee; Le Bouder, Stephane; Fazili, Sameera
Subject: RE: Europe Talking Points TODAY 3pm

Thank you.

After the briefing, I understand that Lael would like additional information to add to the Legislative Memo. Sameera has asked for it by 5:30pm to give to Lael, so she can prep tonight. So, if you have those additional items ready for the memo (attachments, fact sheets, etc.) please send over ASAP.

If not, Sameera asks that you email whatever you have later tonight and she'll hand it off to her tomorrow (please CC me too so I can keep track).

Thanks much,
Andrea

From: Douglass, Dora
Sent: Tuesday, January 31, 2012 3:39 PM
To: Le Bouder, Stephane; Ambriz, Andrea; Smart, Christopher; Baker, Jeffrey
Cc: Jarpe, Rachel; Moghtader, Lailee
Subject: RE: Europe Talking Points TODAY 3pm

(NR) [redacted]

(NR) [redacted]

-

From: Le Bouder, Stephane
Sent: Tuesday, January 31, 2012 10:47 AM
To: Ambriz, Andrea; Smart, Christopher; Baker, Jeffrey; Douglass, Dora
Subject: RE: Europe Talking Points TODAY 3pm

I would just add that, as we'd discussed last week, you all should keep this to a minimum, and feel free to recycle the most current materials you have. Lael knows this inside and out already, and will look more to the leg part of the memo going into each meeting.

Stéphane

From: Ambriz, Andrea
Sent: Tuesday, January 31, 2012 10:44 AM
To: Smart, Christopher; Baker, Jeffrey; Douglass, Dora
Cc: Le Bouder, Stephane
Subject: Europe Talking Points TODAY 3pm

Hi Europe Team,
As a follow up to the mention from last week, Lael has confirmed meetings with Senators Johanns (R-NE), Thune (R-SD), Shelby (R-AL), and Hatch (R-UT) to discuss the current situation in Europe (eurozone crisis) beginning tomorrow (Johanns), 2 on Thursday, and Hatch next week. I have previous Euro talking pts. from December, but I assume those are now out of date.

Could we please get 3 updated top line talking points on the latest update for Europe to include in her memo? Sorry for quick turn around, but please send over by **3pm today**, and I'll include it in all the four memos. All talking points will be the same, so no need to do more than one set.

Thanks much,
Andrea

Andrea Ambriz
Office of Legislative Affairs
US Department of the Treasury
(202) 622-5729
Andrea.Ambriz@treasury.gov

(NR)

[redacted]

Ireland

(NR)

[redacted]

- To boost revenues: a carbon tax at a rate of €15 per ton was introduced on fossil fuels.

(NR)

[redacted]

From: Fazili, Sameera
To: Ambriz, Andrea
Subject: FW: Europe Talking Points TODAY 3pm
Date: Friday, February 10, 2012 5:36:09 PM
Attachments: (b) (5) [redacted].

Unless this is the Europe TPs you were referring to.

From: Baker, Jeffrey
Sent: Tuesday, January 31, 2012 5:12 PM
To: Ambriz, Andrea; Douglass, Dora; Smart, Christopher
Cc: Jarpe, Rachel; Moghtader, Lailee; Le Bouder, Stephane; Fazili, Sameera
Subject: RE: Europe Talking Points TODAY 3pm

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U.S. Treasury Department
Tel: 202-622-4845
(b)(6) [redacted]

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Andrea

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To: Le Bouder, Stephane; Ambriz, Andrea; Smart, Christopher; Baker, Jeffrey
Cc: Jarpe, Rachel; Moghtader, Lailee
Subject: RE: Europe Talking Points TODAY 3pm

Here are some of our recent points.

(NR)

[redacted]

From: Le Bouder, Stephane
Sent: Tuesday, January 31, 2012 10:47 AM
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Cc: Le Bouder, Stephane
Subject: Europe Talking Points TODAY 3pm

Hi Europe Team,
As a follow up to the mention from last week, Lael has confirmed meetings with Senators Johanns (R-NE), Thune (R-SD), Shelby (R-AL), and Hatch (R-UT) to discuss the current situation in Europe (eurozone crisis) beginning tomorrow (Johanns), 2 on Thursday, and Hatch next week. I have previous Euro talking pts. from December, but I assume those are now out of date.

Could we please get 3 updated top line talking points on the latest update for Europe to include in her memo? Sorry for quick turn around, but please send over by **3pm today**, and I'll include it in all the four memos. All talking points will be the same, so no need to do more than one set.

Thanks much,
Andrea

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(NR)

[redacted]

Ireland

(NR)

[redacted]

- To boost <u>revenues</u>: a carbon tax at a rate of €15 per ton was introduced on fossil fuels.

(NR)

[redacted]

UNEP

United Nations Environment Programme

OVERVIEW OF THE REPUBLIC OF KOREA'S NATIONAL STRATEGY FOR GREEN GROWTH

April 2010

Prepared by the United Nations Environment Programme
as part of its Green Economy Initiative

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Overview of the Republic of Korea's National Strategy for Green Growth

Purpose of this report

This report is produced by the United Nations Environment Programme (UNEP) as part of its Green Economy Initiative. The purpose of this report is to present an overview of the Republic of Korea's strategies and policy goals set under National Strategy for Green Growth announced in August 2008. The report also examines Korea's Green New Deal launched in January 2009 along with the Five-Year Plan for Green Growth released in July 2009.

The objectives of the review are:

1) to analyze the change in strategic thinking and economic policy in the Republic of Korea, towards green growth;

2) to outline the plans that the Republic of Korea has put in place to achieve this vision;

3) to discuss the general approach and elements of the Republic of Korea's National Strategy for Green Growth relative to the issues outlined in UNEP's publication "Global Green New Deal: A Policy Brief", published in March 2009.

Acknowledgement

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Comments and suggestions were received from the Secretariat of the Organization for Economic Cooperation and Development (OECD), the Secretariat of the RAMSAR Convention on Wetlands, the International Labour Organization, and the Global Institute for Water, Environment and Health.

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Preparation of this report was directed by Pavan Sukhdev, Special Advisor and Head, UNEP Green Economy Initiative. Sylvie Lemmet, Director of UNEP's Division for Technology, Industry and Economics; Khalida Bouzar, Deputy-Director, of UNEP's Division for Technology, Industry and Economics, Steven Stone, Chief, Economics and Trade Branch and Young-Woo Park, Director, UNEP Regional Office for Asia and the Pacific provided guidance. The report was coordinated by Moustapha Kamal Gueye. Nidal Salim, Director, Global Institute for Water, Environment and Health contributed to the drafting.

The views and opinions expressed in this report are the sole responsibility of the authors, and do not necessarily reflect those of the institutions and individuals indicated above.

Foreword

On 15 August 2008, at a national address on the 60th anniversary of the Republic of Korea, President Lee Myung-Bak announced a “low-carbon, green growth” strategy as a new vision to guide the nation’s long-term development. Six months later, in January 2009, the Government of the Republic of Korea responded to the deepening recession with an economic stimulus package equivalent to US$ 38.1 billion of which 80 per cent (the highest ratio among comparable packages from other G20 governments) was allocated to more efficient use of resources such as fresh-water, waste, energy-efficient buildings, renewable energies, low-carbon vehicles, and the rail network.

Meanwhile, in March 2009, UNEP released a Policy Brief on a Global Green New Deal, encouraging governments to use the opportunity presented by the massive fiscal response to the financial and economic crisis to direct public spending and private investment in green sectors such as energy efficient construction, renewable energies, low carbon transport, sustainable agriculture, and restoring ecological infrastructure, especially forests and freshwater bodies. The UNEP Policy Brief argued that an investment of 1 per cent of global GDP over the next two years could provide the critical mass of green investment needed to reduce carbon dependency and to seed a significant greening of the global economy. UNEP observed that the Republic of Korea’s Green New Deal stimulus package provided a model for its allocation of stimulus towards green infrastructure and lowering carbon dependency.

More recently, on 6 July 2009, the Republic of Korea announced a Five-Year Plan for Green Growth to serve as a medium-term plan for implementing the National Strategy for Green Growth over the period 2009-2013. With total funding of US$ 83.6 billion, representing 2 per cent of GDP, this Five-Year Plan intends to turn the strategy into concrete and operational policy initiatives towards achieving green growth. Indeed, one of the interesting, but least reported, aspects of the current economic recovery efforts is that over two-thirds of global green stimulus has in fact been committed in Asia, led by China, the Republic of Korea, Japan, and Australia.

By extending the Green New Deal into a full five-year development plan, the Republic of Korea has signalled that it believes that green growth is a strategy well beyond current economic recovery efforts, and that it wants to create a green economic future for the Republic of Korea. The Republic of Korea has committed itself to moving away from the traditional "brown economy" growth-at-any-cost model to a "green economy" model where long-term prosperity and sustainability are the key objectives. This commitment by the Republic of Korea has the potential of creating a domino effect on the other major Asian economies.

This report shows that the Republic of Korea is more vulnerable than average to the effects of climate change, and more exposed than most to fossil fuel dependence. During 1912-2008, average surface temperatures in the Republic of Korea rose 1.74°C, which is above the world average. The Republic of Korea has shown the seriousness of its resolve on mitigation by announcing, unilaterally and, despite being a non-Annex I Party to the United Nations Framework Convention on Climate Change/Kyoto Protocol (i.e. not required to take on emissions reductions), a voluntary emission reduction targets. The Republic of Korea is 97 per cent dependent on fossil-fuel imports out of their total energy demand, and thus highly exposed to oil price shocks, as well as any secular rise in oil prices due to the observed peaking of oil. In their new strategy, the share

of renewable energy in total energy supply is planned to go up from 2.7 per cent (2009) to 3.78 per cent (2013), and more than doubling to 6.08 per cent (2020). UNEP encourages an even more aggressive target to improve the Republic of Korea's future energy security and to further support its strategy and plans for green growth.

Freshwater scarcity has long been, and still is, a critical challenge facing Korea. With global warming likely to continue, the levels of flooding and drought are expected to worsen. The large investment (22.2 trillion Korean won (US$ 17.3 billion)) in the Four Major Rivers Restoration Project has, among its five key objectives, securing sufficient water resources against water scarcity, implementing comprehensive flood control measures, and improving water quality whilst restoring the river-basin ecosystems. UNEP encourages the stepping up of investment in ecological restoration, to address this key ecological scarcity as well as to prepare effective and cheap adaptation strategies for the onset of climate change reducing recurrent costs associated with periodic flooding.

The overview presented in UNEP's earlier "Interim Report" has been incorporated into this "Final Report" submitted by UNEP to the Government of the Republic of Korea. These reports were prepared to further UNEP's strategy of supporting the Republic of Korea and other governments to engender deep change which targets a "Green Economy": an economy of permanence, one which generates wealth and well-being, increases employment, reduces poverty and inequality, and does so without exhausting natural capital or creating ecological scarcities and climate risks.

Pavan Sukhdev
Special Advisor and Head UNEP Green Economy Initiative

Executive Summary

Transforming the global economy away from dependence on fossil fuels and unsustainable use of the Earth's limited resources and achieving a transition towards a Green Economy[1] is not an option; it is a fundamental requirement for the survival of our economic and social systems in the 21st century.

The Republic of Korea's National Strategy and Five-Year Plan for Green Growth represent a major attempt to fundamentally transform the country's growth paradigm from "quantitative growth" to low-carbon, "qualitative growth". The green growth strategy contains encouraging policy goals and targets to tackle climate change and enhance energy security, create new engines of growth through investment in environmental sectors, and develop ecological infrastructure. The commitment to spend 2 per cent of gross domestic product (GDP) over the next five years, for investment in areas such as green technologies, resource and material efficiency, renewable energies, sustainable transport, green buildings, and ecosystem restoration, is a remarkable effort to reorient and refocus investment in the environment.

The Republic of Korea responded to the economic crisis with a stimulus package that included a significant portion of green spending. In fact, it has been particularly efficient in the actual disbursement of its fiscal stimulus, with almost 20 per cent of funds disbursed at the end of the first half of 2009, compared to 3 per cent for most countries.

Beyond its policies at the national level, the Republic of Korea is demonstrating engagement and leadership at the international level by boosting global efforts towards achieving a green economy. The Republic of Korea was instrumental in the adoption of a Declaration on Green Growth by the Ministerial Council Meeting of member countries of the Organisation for Economic Cooperation and Development (OECD) on 25 June 2009. It is also playing a key role in promoting an East Asia Climate Partnership.

The bullet points below summarise the key action areas contained in the Korean Green Growth Strategy, the outcome of the review done by UNEP, and the main recommendations.

Climate Change

- Korean carbon emissions have been growing fast and are expected to grow much faster than the average for the OECD countries. Under the International Energy Agency's (IEA) reference scenario, which assumes that the level of growth in carbon emissions continues from the 2002 level, the Republic of Korea would increase its emissions by close to 35 per cent in 2025, compared to less than 15 per cent for the whole of the OECD countries. In the IEA's low-emissions scenario, carbon emissions would grow by slightly less than 25 per cent in 2025, compared to 5 per cent for the whole of the OECD countries.

- This makes is critical and urgent for the country to address the challenges posed by the level and pace of growth of carbon emissions and their consequences. Moreover, achieving a low-carbon green growth will require an effort to reduce the carbon intensity of the Korean economy.

- Given its status as a non-Annex I Party to the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), the Republic of Korea's announcement, in a voluntary and independent manner, of a national mid-term target to reduce its greenhouse gas (GHG) emissions by 30 per cent by 2020 from its otherwise projected growth is very encouraging. This is the highest reduction level that the IPCC has recommended for developing nations.

- The creation of a carbon emission trading scheme in Korea can be an important step forward. But to be successful it should involve effective caps on emissions, a proper coverage of high-emission sectors, and mechanisms for allocation of emission permits that encourage mitigation efforts. It is also important to design new systems to work in harmonious ways with the existing ones.

- The Republic of Korea could enhance its capacity to respond and adapt to climate change impacts such as sea level rise, flooding, and heavy rains and reduced forest density by carefully assessing the capacity of measures proposed under the green growth plan to achieve such objectives.

- In particular, UNEP encourages ecosystem-based adaptation strategies, including ecological restoration and riparian reforestation. Forests and wetlands that are prevalent in a large part of the Korean peninsula, if properly conserved and made more resilient, could play important roles in climate change adaptation, as natural defences against increasing hazards associated with climate change, such as storms, cyclones, flooding and sea-level rise, thereby alleviating future expenditures associated with disaster recovery.

Energy Efficiency

- Enhancing energy efficiency is particularly important given that manufacturing and energy-intensive industries remain predominant in the Korean economy. With the world's largest shipbuilding industry and the fifth largest steel production, industry in the Republic of Korea accounts for 27.9 per cent of GDP. This is well above the 17.4 per cent OECD average.

- The 2006 OECD *Environment Performance Review of Korea* noted that "Korea is one of the few OECD countries which have not improved its energy intensity (energy use per unit of GDP) relative to 1990." In its 2006 *Energy Policy Review of Korea*, the International Energy Agency (IEA) found Korea's energy efficiency targets as not particularly ambitious.

- The new targets set under the green growth plan to enhance efficiency from 0.290 TOE/US$' 000 in 2013 and to 0.233 TOE/US$' 000 in 2020 appear to be an improvement on the targets in the General Energy Conservation and Efficiency Improvement Plan adopted in 2004. In comparative terms, however, energy intensity remains slightly above that of most IEA member countries.

- The Republic of Korea could improve its position by seeking greater convergence with other OECD countries by gradually raising its energy efficiency targets, with a view to match at least the OECD average.

- The Republic of Korea could improve compliance and results by monitoring voluntary agreements with industry, to ensure they achieve the expected targets, and consider alternative policies in case voluntary targets are not met.

Renewables and Nuclear Energy

- The Republic of Korea has daunting energy challenges. It is the world's fifth largest importer of oil (2007) and the second largest importer of coal (2008). The green growth plan to increase the share of new and renewable energy in total energy supply from 2.7 per cent in 2009 to 3.78 per cent in 2013, and 6.08 per cent in 2020 would double the share of renewables in energy supply. When renewable energy that will be generated from the 1 Million Green Homes Project is taken into consideration, the share of renewable energies in total energy supply would be 11 per cent in 2030. This will not only reduce the country's carbon footprint but also dependence on volatile fuel imports.

- In comparison with renewable energy targets adopted in many comparable countries, these Korean renewable energy targets appear to be relatively modest. However, the pace of change envisaged is remarkable considering that the country had increased its renewable energy supply only by 0.37 per cent in the past, from 2.06 per cent in 2005 to 2.43 per cent in 2008. UNEP encourages an even more aggressive target to improve future energy security and to further efforts toward green growth.

- Government will have to expand assistance for the national strategic technology development in such areas as solar and bio-energy technologies and pursue the target through various policy measures such as RPS, waste energy, and the 1 Million Green Homes Project.

- UNEP recommends that the Republic of Korea ensure that further development of nuclear energy continues to remain in line with best international standards, and that transfer and export of nuclear energy technology contributes to enhancing the safety, stability, and economic viability of nuclear energy generation in other countries pursuing nuclear energy options.

Transport, Cities and Fuel Efficiency

- The transport sector accounts for 21 per cent of Korean energy consumption, with an annual average increase rate of 6.3 per cent. As the world's fifth largest car manufacturer, the Republic of Korea has an important role to play in enabling greater efficiency in the automobile industry and significantly reducing emissions from the transport sector.

- In the area of fuel economy, countries around the world, including OECD member countries and several other countries, have set fuel economy standards. While the targets and timelines vary, there is growing convergence towards a global average reduction of 50 per cent by 2050, which would be around 25km/litre. The Republic of Korea's target of 15.1km/litre by 2016, from 11km/litre in 2009, is generally in that direction.

- In promoting a technology and innovation-driven automobile industry, the Republic of Korea could formulate specific policies and measures to provide the physical and policy

infrastructure in support of the development of a smart grid system by 2013 in order to encourage plug-in hybrid and electric vehicles.

- The Republic of Korea could further promote a modal shift by ensuring that non-motorized transport modes are encouraged through the integration of cycling lanes within the larger transport infrastructure, especially public transport, both in urban and rural areas.

- The Republic of Korea announced a GHG reduction target of 31 per cent by 2020 for the building sector, which is the highest level compared to any other country. The target includes strengthening energy standards by 30 percent by 2012, achieving passive level by 2017, and zero-energy housing by 2025.

Water and Ecological Infrastructure

- The Republic of Korea faces many water related challenges due to rapid economic growth and high population density. Reports indicate that current aqua-ecosystem protection mechanisms are insufficient. Climate change could exacerbate risks of water scarcity and increase the frequency and intensity of floods.

- In response to these challenges, the Four Major Rivers Restoration as a part of the "Green New Deal" policy attempts to secure abundant water resources; create systems for flood control; improve water quality; restore ecosystems; and to create opportunities for rural development. These are important policy goals that could bring numerous positive effects to the national economy and people's lives.

- The attempt of ecological restoration of four rivers (Han, Nakdong, Geum and Yeongsan) and their tributaries is commendable, but its implementation needs to follow approaches that will result in effective "ecological restoration", by making efforts to enhance the ecological integrity of river ecosystems, in order to achieve the important policy objectives pursued under this project.

- UNEP recommends paying particular attention to compliance with the results of environmental impact assessments, and to ensuring the maintenance of key ecosystem functions**,** since the four major rivers are ecologically sensitive.

Green Technologies

- As seen, industry accounts for a large part of the Korean economy, in proportions that are much higher than in other OECD countries. A technological transformation that reduces the carbon intensity of industry, in particular in Korea's manufacturing sector, is therefore a core component of a green growth strategy.

- The Korean Green Growth Plan seeks to promote the development of 27 core green technologies that would provide future engines of growth to the Korean economy. UNEP encourages that the development of new green technologies goes hand-in-hand with the greening of the existing manufacturing sector by adopting specific policy goals and targets to reduce carbon intensity and energy intensity.

- In addition, taking a more comprehensive reform of existing incentives and other support mechanisms in carbon and energy-intensive industries would complement and support efforts to spur green innovation.

Policy and Fiscal Reforms

- Carefully tailored, time-bound, and targeted fiscal and financial incentives are recognized as essential in facilitating the transition towards a green economy.

- The Republic of Korea is taking important policy and fiscal measures with include a reform of energy pricing, the creation of a national carbon market, the adoption of tax reforms that lower the tax burden on consumption of low-carbon goods, and fiscal incentives to encourage investment in green sectors.

- The creation of enabling conditions for low-carbon green growth must, however, be comprehensive. It is essential that harmful policies, including harmful subsidies in energy, transport, agriculture and fisheries that not only lead to economic and market distortions, but also undermine a proper accounting for natural capital, are reformed across the entire economy, or at least be part of a long-term plan.

- In addition, fiscal and financial incentives need to be provided in ways that will not create further production and trade-related distortions at national and international level, so that new industries can be created on an economically and environmentally sustainable basis.

Institutional Process and Participation

- The inter-agency process led by the Presidential Committee on Green Growth is an innovative approach to planning that seeks better coordination of policy-making among ministries of finance, transport, energy, environment, land, and tourism, among others, so that investment decisions are guided by multi-sectoral processes.

- The effort to clearly link the Korean Green Growth strategy with the design of the country's mid-term target for reducing greenhouse gas emissions offers a strategically important opportunity to connect growth and development policy with measures to address climate change. If successful, this would prove that changes in economic systems can simultaneously deliver prosperity and respond adequately to the challenge of climate change.

- At the same time, engaging the private sector and civil society as stakeholders and partners is fundamental. Civil society organizations in the Republic of Korea have been active participants in the debate on Green Growth; either by voicing their concerns or by contributing to analytical thinking with a view to making a contribution to the formulation and implementing of Green Growth policies.

- The Republic of Korea should further promote a process of broad-based dialogue and consultation with a cross-section of all stakeholders in order to generate the necessary public support that could prove to be essential for the success of such transformational public policies.

Learning for other Countries

- Governments should carefully weigh up the economic, social, and environmental costs and benefits of different strategies and policy options, including "green investments" as a means of achieving a more green economy. This is particularly important in times of economic crisis, when jobs are under threat and industries are re-tooling.

- Governments need to set clear and appropriate parameters and indicators in their pursuit of a green economic transformation, in order to ensure that their actions are guided by convincing sustainability goals and principles as well as environmental integrity. Such parameters and indicators should include, but are not limited to; measuring reduction in carbon dependency; reducing ecological scarcity; enhancing resource and material efficiency and decoupling growth and development from depletion of natural capital. Appropriate enhancements to the accounts of society may also be considered, in the form of adjustments to the System of National Accounts, to avoid over-dependence of accounting and reporting on the ubiquitous GDP yardstick which supports measurement of "quantitative" but not "qualitative" growth.

- A significant increase in public and private investment in green sectors such as clean technologies, renewable sources of energy, sustainable agriculture, green construction, sustainable cities and transport, and ecological infrastructure is essential to jump start a significant process of change.

- However, targeted investment alone, without concomitant domestic and international policy reforms will not lead to the enabling conditions needed for the emergence of a green economy. Governments should embrace a comprehensive portfolio of policy measures that remove harmful policies across their economies, including unsustainable subsidises and other incentives to resource extraction and pollution in areas such as energy, agriculture, fisheries, forestry, mining, and industry.

- Developing countries and emerging economies face specific challenges of achieving sustainable economic growth, reducing poverty, and enhancing well-being, while moving their economies towards a green transformation. Balancing these equally important policy goals is at the core of the green economy.

- Launching a process of transformative change that is able to re-orient resource allocation and set a long-term vision towards a green and sustainable path of growth and development requires bold leadership.

- At the same time, building a solid foundation to such a process demands broad-based dialogue and effective participation and contribution by all relevant actors and stakeholders, in order to generate the necessary public support that can prove to be essential for the success of such bold and transformational public policies.

1. The Republic of Korea's National Strategy for Green Growth

From 1962 up until the mid-1990s, the Republic of Korea implemented regular five-year economic development plans based on theories of a quantitative growth paradigm. These economic plans were developed on the premise that labour and capital were key factors of production in a quantitative growth paradigm. Extensive growth in labour and capital made extensive growth possible, but this often had the unintended consequence of fuelling the conflict between growth and quality of life, and led to increased pollution and environmental deterioration.

Despite significant economic progress, the Republic of Korea is faced with numerous challenges and constraints that require reforms and innovative approaches in various areas of the economy and the environment. The Republic of Korea is the world's sixth largest importer of petroleum and the second largest importer of liquefied natural gas (LNG). Overall it imports 97 per cent of its total energy requirements. Given its very high energy import dependence, the country is particularly vulnerable to fluctuations in energy prices and supplies. In 2008, when oil prices reached almost US$ 150 per barrel, Korea spent over US$ 140 billion on imports of energy. This represented over one-third of the country's US$ 400 billion revenues from exports, making it critical for the Republic of Korea to explore other sources of energy supply.

The rapid industrialization and urbanization has led to a significant pressure on the environment and natural resources such as forests and water resources, biodiversity and the urban environment. There is a need to alleviate such pressures on the environment by redefining growth strategies in ways that better integrate economic and environmental objectives.

The Republic of Korea's carbon emissions have increased significantly during the past 15 years, making Korea one of the countries with the fastest growth of carbon emissions. These causes and consequences of climate change require urgent responses both with regard to mitigation of, and adaptation to climate change, including by injecting supplementary investments to lessen the damage caused by climate change.

In responding to these challenges, Korean leaders are focusing efforts on the development of environmentally-friendly industries and technologies in order to stimulate the economy through additional investment, innovation, and employment generation, while having minimal adverse effects on the environment. In this context, President Lee Myung-Bak announced a "low-carbon, green growth[2]" strategy as a new vision to guide the nation's long-term development on 15 August 2008, during a national address on the 60th anniversary of the establishment of the Republic of Korea. The Korean government has presented its Green Growth Vision as an innovative development approach involving a fundamental shift in the country's growth paradigm, from "quantitative growth" to "qualitative growth". The new vision is based on a long-term strategy of green growth up to 2050, which is implemented through Five-Year Plans for Green Growth.

Under the new paradigm of qualitative growth, the essential factors of production are new ideas, transformational innovations, and state-of-the-art technology. Economic growth based on these drivers is expected to generate substantially intensive, qualitative growth unlike the extensive quantitative growth of the past. This approach facilitates a mutually beneficial relationship

between economic growth and the environment. The green growth strategy has three key objectives:

1) Creating new engines of a higher and sustainable growth path by developing low-carbon, environmentally-friendly industries;

2) Ensuring climatic and environmental sustainability; and

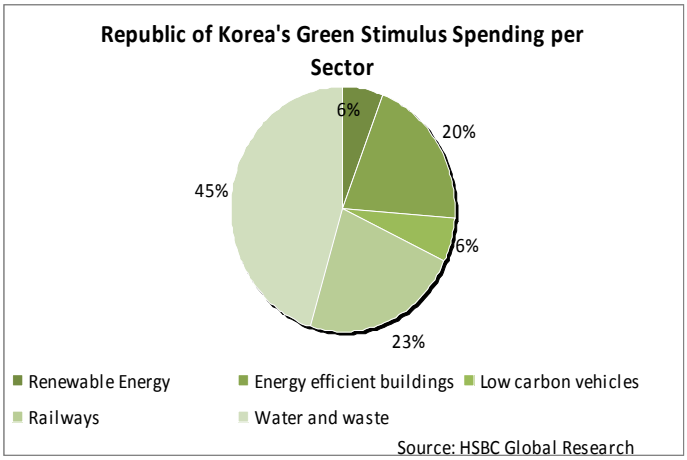
3) Contributing to the international negotiations to fight climate change.

This set of objectives provides the foundation for the green growth strategy which has been articulated through a substantial green stimulus package and a plan of action for the next five years.

1.1 Green Stimulus

The eruption of the financial and economic crisis in late 2008 resulted in a fall in the Republic of Korea's growth rate below 4 per cent in the fourth quarter of 2008. This is a significant reduction when compared to an average rate of growth of between 7 to 8 per cent in the last ten years.

Figure 1: Republic of Korea's green stimulus spending per sector



The Republic of Korea launched a "Green New Deal" on 6 January 2009 as a means of stimulating job creation and revitalizing the economy. The stimulus package, which is comprised of a mix of financial, fiscal and taxation policies, amounted to a total of US$ 38.1 billion, the equivalent of 4 per cent of Gross Domestic Product (GDP), to be implemented over the period 2009-2012. A total of US$ 30.7 billion (about 80 per cent of the total stimulus package) was allocated to environmental themes such as renewable energies (US$ 1.80 billion), energy efficient buildings (US$ 6.19 billion), low carbon vehicles (US$ 1.80 billion), railways (US$ 7.01 billion) and water and waste management (US$ 13.89 billion)[3].

A recent report noted that the Republic of Korea has been particularly efficient in the actual spending of its green stimulus, with almost 20 per cent of funds disbursed at the end of the first half of 2009, compared to only 3 per cent for most countries[4].

In addition, the Korean Government introduced income and corporate tax cuts. Income tax was reduced by 2 per cent. The threshold of tax deductions was raised from 1 million to 1.5 million won (approx. US$ 1,284 – 1,784). Corporate tax will also be reduced from 25 per cent to 22 per cent in 2009 and to 20 per cent in 2010 for large companies and from 13 per cent to 11 per cent in 2009 and to 10 per cent in 2010 for small and medium enterprises (SMEs)[5].

These measures seem to have contributed to stimulating economic recovery. The Republic of Korea was one of the few member countries of the Organization for Economic Co-operation and Development (OECD) that registered a positive growth in the first quarter of 2009 (0.1 per cent). It recorded the highest growth rate in the second quarter (2.3 per cent)[6].

The Korean Green New Deal represents a policy for creating jobs and revitalizing the economy. In the short-term, it aims to respond to the recent economic downturn, and in the mid- and long-term, to boost green growth[7]. The Green New Deal will run through 2012, while the long-term strategy will continue to be pursued through five-year green growth plans; the first of which is implemented from 2009 to 2013.

1.2 Five-Year Plan for Green Growth

Beyond the green stimulus, the Republic of Korea appears to be making a major shift in orienting its economy towards a long-term strategy for green growth. In July 2009, the country adopted a Five-Year Plan for Green Growth (2009/2013) to serve as a medium-term plan for implementing a "low-carbon, green growth vision" announced a year earlier.

The Five-Year Plan encompasses a number of projects that were previously announced as part of the Green New Deal. For instance, the Five-Year Plan integrates the Four Major Rivers Restoration Project previously designated as the main project in the Green New Deal, as well as the "Strategy for New Growth Engines", announced by the Korean Government on 13 January 2009. As such, the Five-Year Plan is an amalgam of several existing and newly designed projects on green growth, articulated as part of a mid- to long-term strategy. In some respects, the Five-Year Plan has expanded the Korean Green New Deal in terms of overall government investment, the number of projects, and the set of policy and fiscal reforms envisaged. In other cases, it streamlined the number of existing projects thus focusing on projects the Korean Government deemed of primary importance, such as the promotion of green technologies.

The plan represents a guide for national policy directions for the green growth vision, specifying future action plans on investments, target goals for each year, including the role of the various actors and stakeholders, such as ministries, along with other government agencies in pursuing the green growth strategy. Under the plan, US$ 83.6 billion, representing 2 per cent of GDP, will be spent in the area of climate change and energy, sustainable transportation and the development of green technologies (for details on the investment plan, see Annex 1).

The Five-Year Plan outlines a set of three strategies, ten policy directions, and 50 core projects. The three strategies comprise measures for addressing climate change and securing energy independence; the creation of new growth engines; and the improvement of the quality of life. Legislators in Korea have been considering a "Basic Law for Green Growth", which will provide the legal basis for Korea's green growth strategy. On December 29, 2009, the Korean National Assembly adopted the Basic Law, which President Lee Myung-Bak signed into law on January 13, 2010.

Table 1: Three strategies and 10 policy directions in Korea's 5-year green growth plan	
Strategies	**Policy directions**
Measures for climate change and securing energy independence	Reduce carbon emissions
	Decrease energy dependence and enhance energy self-suffici
	Support adaptation to climate change impacts
Creation of new growth engines	Develop green technologies as future growth engines
	Greening of industry
	Develop cutting-edge industries
	Set up policy infrastructure for green growth
Improving quality of life and strengthening the status of the Country	Green city and green transport
	Green revolution in lifestyle
	Enhance global cooperation on green growth

Spending on the green growth plan is expected to stimulate production worth 182 to 206 trillion won (US$ 141.1 billion to US$ 160.4 billion) during 2009-2013 with a yearly average production inducement of 36.3 to 41.2 trillion won. This production inducement corresponds to 3.5 to 4.0 per cent of estimated 2009 GDP. The value-added inducement is calculated at 75.0 to 94.9 trillion won 58.4 billion to US$ 73.9 billion) over the five years, with a yearly average of 15.0 to 19.0 trillion won (US$ 11.7 billion to US$14.8 billion). These estimates are based on two scenarios developed by the Presidential Committee on Green Growth, using input-output tables[8] to calculate the expected macro-economic gains from the country's five-year green growth plan.

Through the implementation of the Five-Year Plan, the Korean government expects to create jobs in green industries for 1.18 to 1.47 million people during the five years. In the design of the 50 projects included in the Five-Year Plan, there appears to be a strategy focusing first on large infrastructural projects such as the Four Major Rivers Restoration Project. It is planned that investment will then be directed into the high-technology sectors (the 27 core technologies), which should provide future engines of growth for the country, making use of its highly-educated work force.

Table 2: Estimated economic effects of Korea's Five-Year Plan for Green Growth						
Indicator/period	**Economic gains**					
	Production inducement (US$ Billion)		Value-Added inducement (US$ Billion)		Job creation (thousand people)	
	Case 1	Case 2	Case 1	Case 2	Case 1	Case 2
2009-2013	141.1	160.4	58.4	73.9	1,561	1,805
Yearly average	28.3	32.1	11.7	14.8	312	362
Ratio of Yearly Average to GDP (%) **	3.5*	4.0*	1.5*	1.8*	34.4**	39.8**

* Estimated 2009 GDP = 1,029.5 trillion won (= US$801.0 Billion)
** Number of unemployed in 1st quarter 2009 (908,000)

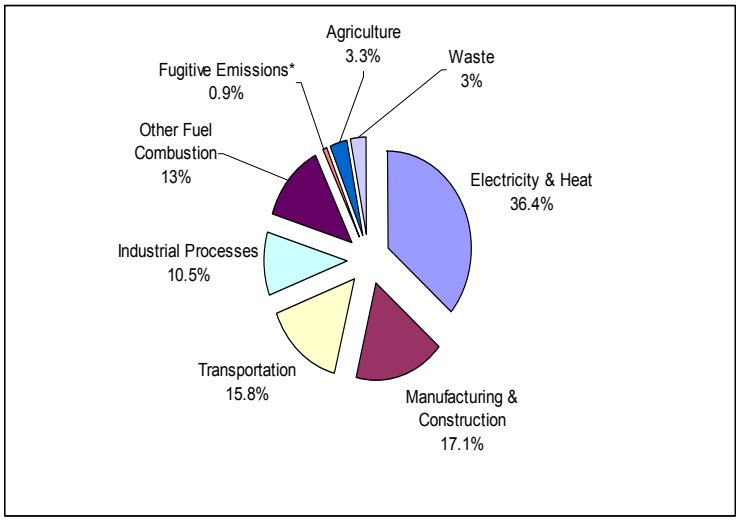
2. Key Aspects of the National Strategy and Five-Year Plan for Green Growth

2.1. Climate Change

Achieving an effective mitigation of greenhouse gas emissions and strengthening the capacity to adapt to climate change are two key aspects of the Republic of Korea's strategy for green growth. Throughout 1912-2008, the average surface temperature in Korea rose by 1.74°C, which is above the world average. Moreover, for the last 40 years, the sea level around Korea (Jeju Island) rose by 22 cm, which is three times higher than the global average sea level rise[9].

Korea's carbon emissions both in total and per capita doubled between 1990 and 2005, making it the fastest growing source of emissions in the OECD (see Annex 5). This has given raise to concerns about the climate change impacts of the country's rapid pace of growth and industrialisation.

Figure 2: GHG Emissions by Sector in 2005 (CO_2, CH4, PFCs, HFCs, SF6, excludes land use change).

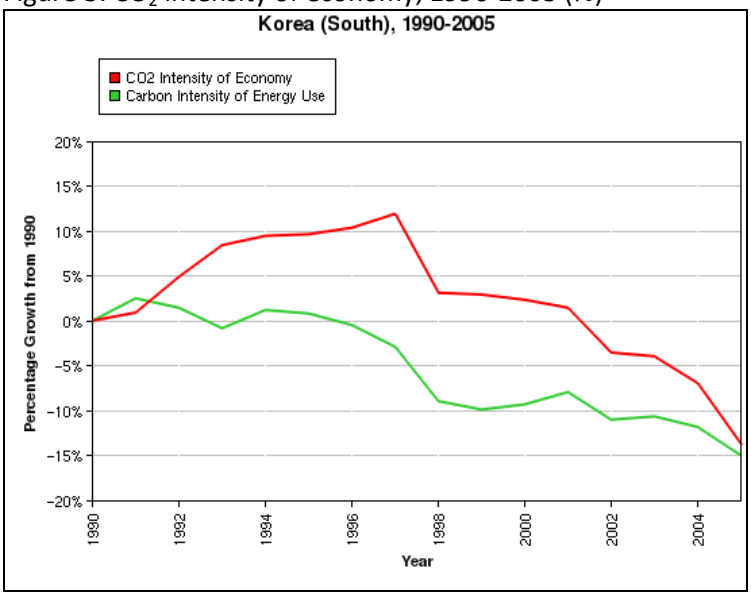


Source: Based on data from Climate Analysis Indicators Tool (CAIT) Version 6.0. World Resources Institute, 2009.

On a sectoral basis, the Republic of Korea's greenhouse gas emissions are concentrated in electricity and heat, manufacturing, transportation, and industrial processes. Energy-related emissions from all sectors cumulating to 456.6 Mt CO_2e in 2005, account for the bulk of GHG emissions (see Figure 2).

The Korean Presidential Committee on Green Growth estimates that under a business-as-usual scenario, the Republic of Korea's carbon emissions are estimated to increase by 30 per cent by 2020.

Figure 3: CO_2 intensity of economy, 1990-2005 (%)



Source: World Resources Institute. The Climate Analysis Indicators Tool (CAIT).

The carbon-intensity of the Korean economy has declined noticeably since 1997 (Figure 3), but remains relatively high in comparison with other OECD member countries.

In fact, compared to the IEA average, in 2004 Korea's energy-related CO_2 emissions per unit of GDP (a measure of CO_2 intensity) was over 40 per cent higher than Japan, nearly 23 per cent higher than the IEA Pacific average (Australia, Japan, Korea and New Zealand), and 15 per cent above the total IEA average[10].

The Republic of Korea is a non-Annex I country, and as such is not bound by mandatory greenhouse gas reduction obligations under the Kyoto Protocol. However, as a growing economy and a member of the OECD, Korea is increasingly regarded as having an important role to play in the global effort to mitigate climate change.

The OECD 2006 Environmental Performance Review of Korea stressed that the Republic of Korea's carbon dioxide (CO_2) emissions as well as its use of energy, pesticides, and fertilizers are among the highest in the OECD relative to GDP or area[11]. The Review recommended that the Republic of Korea set out in the next national plan on climate change "specific objectives and precise measures to be taken over the next few years to reduce the rate of growth of greenhouse gas emissions in order to participate actively in the UNFCCC process."

2.1.1. Korean Green Growth plans and objectives

At the G-8 extended summit held in Toyako, Hokkaido, Japan in July 2008, President Lee Myung-bak indicated that Korea would announce its mid-term emissions reduction goal in 2009. Korea announced on 4 August 2009 that it would voluntarily reduce its carbon emissions by 2020, from the 2005 level, using a target from three options. Under these scenarios, the country's emissions would be reduced by 21, 27, and 30 per cent, compared to projected growth in 2020[12].

Box 1: Korea's 2020 midterm greenhouse gas (GHG) mitigation target

Scenario 1: 21 per cent reduction from BAU (8 per cent increase from 2005 level)

- Achieved through implementation of measures with short-term cost but potential long-term benefits.

Scenario 2: 27 per cent reduction from BAU (Return to 2005 level)

- Implementation of additional measures from scenario 1, which have a mitigation cost of less than 50,000 WON (approx. US$ 28) per ton of CO_2.

Scenario 3: 30 per cent reduction from BAU (4 per cent reduction from 2005 level)

- Implementation of aggressive measures with high mitigation cost.

Notes:
Korea's 2005 GHG emission = 594 $MtCO_{2e}$
BAU = Business as Usual
Not including offsets from forest management

On 17 November 2009, the Presidential Committee on Green Growth announced a decision taken at a cabinet meeting presided over by President Lee Myung-bak to adopt the most ambitious of the three options considered, that is a 30 per cent reduction of future emissions.

Along with a mid-term mitigation goal, climate change initiatives laid out in the five-year green growth plan include the adoption of a legal and regulatory framework, carbon emissions trading, the creation by 2010 of a national GHG inventory report system, in addition to raising public awareness. Other measures announced include the adoption of new auto emission standards, a waste-to-energy programme to reduce GHG emissions from waste materials, promoting low-carbon transportation, the introduction of light-emitting diodes (LEDs); stricter heat insulation standards for buildings, and development of carbon capture and storage (CCS) technologies. A Basic Law on Low-carbon and Green Growth, which was adopted by the Korean National Assemble in December 2009, provides the basic legislation for Korea's green growth strategy, including countermeasures on climate change.

The carbon market is projected to be a major policy tool for GHG reductions in Korean Plan. It is further expected that the growing carbon market will create an innovative business environment for domestic and international industries. Although details of the carbon market, including the auctioning and/or pricing of carbon emission permits, and industries to be covered under the scheme, are yet to be defined, Korea is positioned to capitalize on this market.

Forests cover more than two-thirds of the Korean land surface. The potential for reducing emissions from the forest sector is expected to be enhanced from 1.452 billion CO_2 ton to 1.613 billion CO_2 ton in 2013. The Five-Year Plan also incorporates provisions for aid for forest projects in the Democratic People's Republic of Korea.

Additionally, the establishment of a "Carbon Point System" will reward achievement at reducing carbon emissions or the purchase of low-carbon products with "carbon points", which can be exchanged for discounts at public facilities. In October 2008, the Korean Ministry of Environment kicked off a public awareness campaign entitled "Green Start Movement". The initial participants in the programme were officials from governmental agencies, local administrations, and civic groups. The Ministry seeks to expand the movement among the general public.

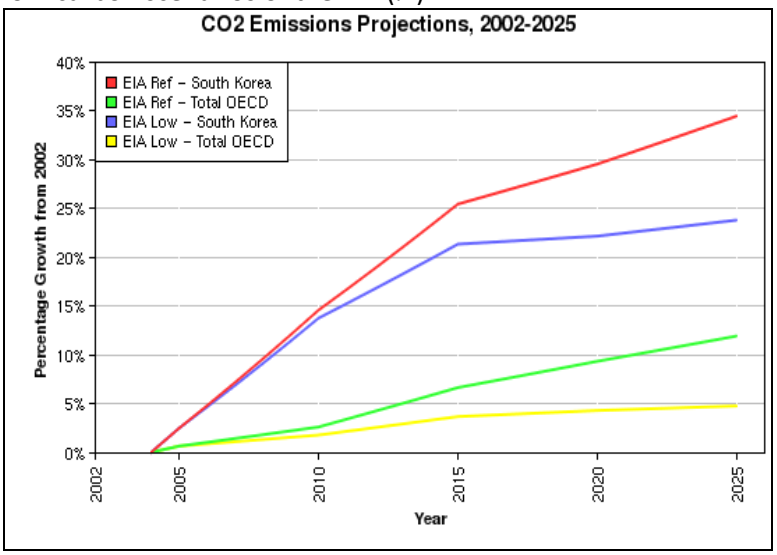
The Five-Year Plan includes measures to undertake climate change risk assessment and to develop action plans to prepare for the likely impacts of climate change on infrastructure, health, water management, agriculture, biodiversity and housing, and options for dealing with them. Efforts will focus on improving the validity of climate change forecasting.

Securing water resources is a critical dimension of climate change adaptation objectives. In that respect, around 1.3 billion cubic meters will be secured by 2012, as part of the Four Major Rivers Restoration Project (see discussion below). Ecological defence systems will be developed through the setting up of forest protection and forest ecosystem management programmes. The Republic of Korea aims to increase the capacity of national forest resources from 862 million cubic meters to 953 million cubic meters by enhancing forest protection and forest ecosystem management programmes.

2.1.2. Review

Given its status as a non-Annex I country to the Kyoto Protocol to the UNFCCC, the Republic of Korea's announcement of a national mid-term climate change mitigation target is a voluntary step that is very encouraging. The Korean Government made it explicit that its carbon emissions reduction target was not conditional to the outcome of the United Nations Climate Change Conference in December 2009. It is a "unilateral and voluntary mitigation action to be undertaken without any foreign support."[13]

Figure 4: Projected growth in CO_2 emissions under reference and low-carbon scenarios of the IEA (%)



Source: World Resources Institute. The Climate Analysis Indicators Tool (CAIT).

Although the nature and level of the emissions reduction that Korea may have to undertake under the framework of global climate change negotiations are yet to be defined, it appears clearly that achieving the objectives of a low-carbon green growth will require an effort to reduce the carbon intensity of the Korean economy and the pace of growth of carbon emissions.

In 2004, Korea recorded a 105 per cent increase in its carbon dioxide emissions compared to the level of the 1990s; a rate second only to China's. Future emissions are expected to keep growing fast. Both in the reference scenario and low-emission-scenario, projections by the International Energy Agency indicate that the growth of carbon emissions in Korea will remain well above that of the average in the OECD countries. Under the reference scenario, which assumes that the level of growth in carbon emissions continues from the 2002 level, Korea would increase its emissions by close to 35 per cent in 2025, compared to less than 15 per cent for the whole of the OECD countries. In the low-emissions scenario, the Republic of Korea's carbon emissions would grow by slightly less than 25 per cent in 2025, compared to 5 per cent for the whole of the OECD countries (see Figure 4). This makes it even more urgent and challenging to reduce GHG emissions, in order to achieve convergence with other OECD countries.

There is growing convergence of views that achieving a global reduction target that would limit the global temperature increase since pre-industrial times below 2°C – the threshold beyond which irreversible and possibly catastrophic changes become far more likely – is essential. Parties to the UNFCCC and the Kyoto Protocol have announced emission reduction targets that are being considered as negotiations proceed. The EU has announced reducing its overall emissions to at least 20 per cent below 1990 levels by 2020, and expressed readiness to scale up this reduction to as much as 30 per cent under a new global climate change agreement if other developed countries make comparable efforts.

The global effort to tackle climate change is guided, among others, by the principle of common but differentiated responsibilities and respective capabilities. As a result, the same level of emission reduction undertaken by Annex I Parties may not be demanded of countries such as the Republic of Korea. Nonetheless, it is clear that the more ambitious the target, the greater the contribution will be in responding to the urgency of action on climate change. Climate change poses serious challenges to Korea's own future development, prosperity, and security against natural disasters and other climate risks that warrant the utmost attention to reduce greenhouse gas emissions.

The Korean Government has stated that its 30 per cent GHG emissions reduction goal represents the highest reduction target recommended by the Inter-governmental Panel on Climate Change (IPCC) for developing countries. Nonetheless, the Korean Government recognizes that indicators such as economic growth, population growth, and assumptions on oil prices used to project future emissions under a reference scenario by 2020 may need to be adjusted to reflect changes in actual conditions by 2020. It is accordingly putting in place an inventory of emissions to ensure accuracy of data.

On 29 December 2009, the National Assembly passed the Framework Act on Low-carbon Green Growth. On 6 April 2010, the government adopted the Enforcement Decree of the Framework Act on Low Carbon during the 15th Cabinet meeting. Both the law and its enforcement decree are due to come into effect on 14 April 2010. The Law includes a system of mandatory reporting of carbon emissions by all carbon and energy-intensive industries. It provides a basis for the creation of a carbon trading system. The Basic Law mandates a cap on emissions, but leaves out the operational structure, the method of allocation of emissions permits, the sectoral coverage, and other details for implementing laws to decide.

The creation of a carbon emissions trading scheme is an important step forward. But its effectiveness will depend on the actual cap on emissions, the mechanism for allocation of emissions permits, and the sectoral coverage. In particular, whether the power generation sector, the steel and automobile industries and other high-emission sectors are covered or not, and modalities of granting them emission allowances, are likely to be determinant. For example, the potential that an increased share of renewable energy will lead to lower CO_2 emissions can easily be diffused by a carbon trading scheme that allows power plants to receive free allowances or to operate under a very loose "cap" on emissions.

As a non-Annex I Party to the Kyoto Protocol Korea is not bound by mandatory annual reporting and annual review of GHG emissions under the Kyoto Protocol national greenhouse gas inventory system. However, as for all non-Annex I Parties to the Kyoto Protocol, Korea is compelled to produce periodical reporting as part of national communications. A further step forward to the creation of a national GHG inventory system would be to consider articulating it on a measurable, reportable, and verifiable basis under existing or future global reporting schemes of the UNFCCC and Kyoto Protocol.

The Five-Year Plan identifies adaptation to climate change as a key priority for Korea. A significant portion of the funds set for adaptation to climate change will be used as part of the Four Major Rivers Restoration Project (discussed below). For Korea and other countries in Asia, sea-level rise and associated flooding are among the most serious risks posed by climate change. The fourth assessment report by the IPCC indicates that for one metre sea-level rise with high tide and storm surge, an estimated 2,643 km2 or about 1.2 per cent of the total area of the Korean Peninsula could face inundation. Measures to respond to sea-level rise could take the form of protection, accommodation, and retreat. As substantial socio-economic activities and populations are currently highly concentrated in the coastal zones, protection should remain a key focus area in Asia. The IPCC reports suggest that coastal protection constructions in Asia for 5-year to 1,000-year storm-surge elevations need to be considered.

A number of measures proposed under the Four Major Rivers Restoration Project are meant to provide such defences. At the same time, forests and wetlands that are prevalent in a large part of the Korean peninsula, if properly conserved and made more resilient, could play important infrastructural functions, and provide natural defences against increasing hazards associated with climate change, such as storms, cyclones, flooding and sea-level rise. However, as a result of global warming, the coverage of broad-leaved Korean pine forests is projected to decrease by 20 to 35 per cent, which may affect the capacity of forests to remain as effective natural defences against future climate impacts. This makes it critical that protection of forests be strengthened as expected effects of climate change will reduce forest density in parts of the country.

The implementation of ecological restoration, through reforestation, including riparian reforestation, can significantly enhance resilience. The review of a large number of restoration projects under the UNEP-led study on The Economics of Ecosystems and Biodiversity (TEEB) suggests that through ecological restoration, resilience improvements can be found in three significant areas of adaptation: (1) freshwater security; (2) food security (both artisanal fisheries and small farms productivity); and (3) natural hazard risk management (cyclones, storms, floods, droughts)[14].

2.2. Energy Efficiency

A successful execution of the green growth strategy, such that it delivers low-carbon growth entails a decoupling of economic growth from carbon emissions and intensive-energy use. This, in turn, requires significant reductions in the carbon-intensity and the energy-intensity of growth. Korea faces challenges in that regard, given that despite important progress in the past several years, energy-intensity remains high in comparison with other OECD countries. The 2006 OECD Review noted that "Korea is one of the few OECD countries, which has not improved its energy intensity (energy use per unit of GDP) relative to 1990".

2.2.1. Korean Green Growth plans and objectives

The Five-Year Plan involves measures targeting high-emission industries, through a "negotiated agreement" between the government and large energy-consuming companies in order to reduce energy consumption. The "negotiated agreement" will be applied to companies with an annual energy consumption over 500 thousand TOE in 2010, over 50 thousand TOE in 2011, and over 20 thousand TOE in 2012. In the transport sector, there will be new standards to increase the fuel efficiency for automobiles and institute a reporting system on transport companies with high-energy consumption (further discussed in section 2.4 below). A ban on incandescent lights, which are considered to have a low energy performance, will be introduced by 2013 in order to promote the diffusion of light emitting diode bulbs (LEDs) with 3 to 5 times higher energy-efficiency.

The electricity pricing system will be changed into a cost-based electricity pricing system. It is expected that the change in pricing will give a strong signal to corporate and household energy users which may translate in important behavioural change and energy savings. At the same time, there appears to be an attempt to minimize the effects of energy pricing on lower-income households, with an objective of reducing the number of households whose energy expenditure is worth 10 per cent of their total revenue from 7.3 per cent of total households in 2009 to 5.0 per cent in 2013.

Overall, this set of measures for the development and dissemination of hybrid electric vehicles, the adoption of stringent standards on fuel efficiency, energy conservation and green buildings, and the promotion of investment in energy conservation facilities should increase total energy efficiency from 0.317 ton of oil equivalent TOE/US$' 000 in 2009 to 0.290 TOE/ US$' 000 in 2013 and to 0.233 TOE/ US$' 000 in 2020.

2.2.2. Review

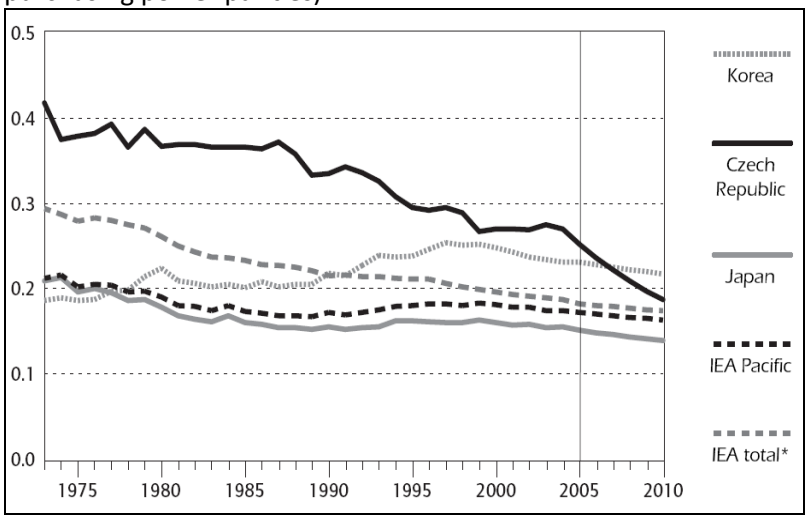
Enhancing energy efficiency is particularly important given that manufacturing and energy-intensive industries remain predominant in the Korean economy. With the world's largest shipbuilding industry and the fifth largest steel production, industry in Korea accounts for 27.9 per cent of GDP which is well above the 17.4 per cent OECD average.

In 2004, the Korean Government adopted a General Energy Conservation and Efficiency Improvement Plan, which set the objective of enhancing energy efficiency so that Korea's energy intensity is reduced from 0.359 TOE/US$' 000 in 2004 to 0.328 in 2007, and then to 0.294 by 2012. In its 2006 Energy Policy Review of Korea, the International Energy Agency noted that

Korea's current energy efficiency targets were not high at that time and could be improved. The new targets set under the Five-Year Plan to enhance efficiency from 0.290 TOE/US$' 000 in 2013 and to 0.233 TOE/US$' 000 in 2020 appear to be an improvement on the targets in the General Energy Conservation and Efficiency Improvement Plan. In comparative terms, however, energy-intensity will remain slightly above that of most IEA countries (see Figure 5).

The banning of inefficient light bulbs is in line with policies that are being implemented in a number of countries around the world. Measures to phase out incandescent lights have already been announced in countries such as Australia (by 2010), the Philippines (by 2010), and the member countries of the European Union (by 2012). In Denmark, the ban became operational as of October 2009.

Figure 5: Energy Intensity in Korea and other Selected IEA Countries, 1973 to 2010 (TOE/US$' 000 at 2000 prices and purchasing power parities)



*excluding Luxembourg and Norway throughout the series, as forecast data are not available for these countries.
Sources: *Energy Balances of OECD Countries*, IEA/OECD Paris, 2006; *National Accounts of OECD Countries*, OECD Paris, 2006; and country submissions (IEA, *Energy Policies of IEA Countries: The Republic of Korea,* 2006, Figure 8).

The focus of the effort to reduce energy intensity in the industrial sector will depend of the effectiveness of implementing voluntary agreements with industry. Whereas such an approach is not new in Korea, having been practiced in the past, more stringent monitoring may be required as Korea is in the process of setting measurable carbon reduction goals at the international level.

This will make it necessary for the country to ensure that objectives and targets are met within the timeframe indicated, and that measures to reward compliance or otherwise sanction non-compliance are also part of the policy approach.

The experience with collective voluntary approaches in the OECD countries suggests that failing such a stringent approach, "negotiated agreements" may lead to significant problems of free-riding, as firms manage to avoid the imposition of mandatory targets while maintaining a *status quo* on their emissions and energy-intensity. Therefore, it is critical that voluntary agreements with industry are monitored to ensure that they achieve the expected targets, and that alternative policies are considered in case voluntary targets are not met. The Korean Government's newly announced "negotiated agreements" with measuring, reporting, and monitoring (MRV) processes will help in this regard.

Reforming energy prices so that they reflect true market costs is a natural complement to setting standards and targets on energy efficiency. The energy pricing reform discussed below will therefore play an important part in advancing the effort on efficiency improvement.

2.3. Renewables and Nuclear Energy

Korea has daunting energy challenges. It is the world's fifth largest importer of oil (118 Mt of imports in 2007 and second largest importer of coal (100 Mt of hard coal imports in 2008)[15]. Given its high energy import dependence, Korea is seeking to expand its renewable energy generation through target setting and regulator measures.

2.3.1. Korean Green Growth plans and objectives

Under the Five-Year Plan, the share of new and renewable energy in total energy supply is expected to increase from 2.7 per cent in 2009 to 3.78 per cent in 2013, and 6.08 per cent in 2020. Renewable energy generation from the "1 Million Green Homes" project would increase this share to 11 per cent in 2030.

In 2006 the amount of waste generated daily in Korea was approximately 320 thousand tons. Currently, energy generated from waste accounts for 76 per cent of the renewable energy in Korea. To develop such a potential, the Korean Government plans to implement measures for waste resources and biomass energy by utilizing waste energy, agricultural and marine biomass, forest biomass, and building low carbon and green villages. To generate energy from 3.86 million tons per year of combustible and organic waste resources, 48 environmental energy facilities will be installed by 2013. In addition, in order to recollect and reuse the heat from incinerators, 17 remaining heat collecting facilities are planned to be built, and to recollect and reuse the landfill gas from landfill sites all over the country, 25 landfill gas recollecting facilities are planed to be built. A comprehensive system for treatment of waste resources from the industrial sector will be prepared by 2011. Technologies that are currently employed in the chemical industry will also be deployed to promote the development of renewable energy. To efficiently produce and utilize waste energy, integration and broad-banding of energy plants will be pursued by 2020.

Nuclear energy has been an important source of energy supply in Korea. Under the green growth strategy, Korea seeks to further develop its nuclear technology. The country will gradually increase the proportion of nuclear energy in power generation from 24 per cent in 2009, to 27 per cent in 2013, and to 32 per cent in 2020.

The development of tidal power is a notable change in the country's energy matrix. Starting virtually from nil in 2008, tidal power generation will expand to 0.9 per cent of total renewable energy generation in 2010 and 5.2 per cent in 2020, representing a 50 per cent annual increase.

Hydropower generation is also expected to increase, with the construction of new dams and 42 hydroelectric plants that would generate 278,471 MWh per year. Nonetheless, the share of hydropower in the total renewable energy supply will decrease, as a result of larger increases in the other renewable resources such as bioenergy, wind, tidal power, and solar PV and solar thermal.

Other targets include building fourteen "Environment Energy Towns" in eight areas nationwide by 2020. Such towns will employ efficient use of waste resources, green power, and biomass. In small regional communities, a total of 600 low-carbon green villages are expected to be built. The government plans to build one million energy-saving green homes by 2020 and to refurbish one million existing houses using new and renewable energy.

Table 3: New and renewable energy (NRE) deployment in Korea: Status and projections (Unit: Thou. TOE, %)

	2008	**2010**	**2015**	**2020**	**2030**	**Annual increase (%)**
Solar thermal	33 (0.5)	40 (0.5)	63 (0.5)	342 (2.0)	1,882 (5.7)	20.2
PV	59 (0.9)	138 (1.8)	313 (2.7)	552 (3.2)	1,364 (4.1)	15.3
Wind	106 (1.7)	220 (2.9)	1,084 (9.2)	2,035 (11.6)	4,155 (12.6)	18.1
Bioenergy	518 (8.1)	987 (13.0)	2,210 (18.8)	4,211 (24.0)	10,357 (31.4)	14.6
Hydro	946 (14.9)	972 (12.8)	1,071 (9.1)	1,165 (6.6)	1,447 (4.4)	1.9
Geothermal	9 (0.1)	43 (0.6)	280 (2.4)	544 (3.1)	1,261 (3.8)	25.5
Marine	0 (0.0)	70 (0.9)	393 (3.3)	907 (5.2)	1,540 (4.7)	49.6
Waste	4,688 (73.7)	5,097 (67.4)	6,316 (53.8)	7,764 (44.3)	11,021 (33.4)	4.0
Total	**6,360**	**7,566**	**11,731**	**17,520**	**33,027**	**7.8**
Primary Energy (M TOE)	**247**	**253**	**270**	**287**	**300**	**0.9**
Share (%)	**2.58%**	**2.98%**	**4.33%**	**6.08%**	**11.0%**	

Source: Korea Energy Management Corporation, April 2010.

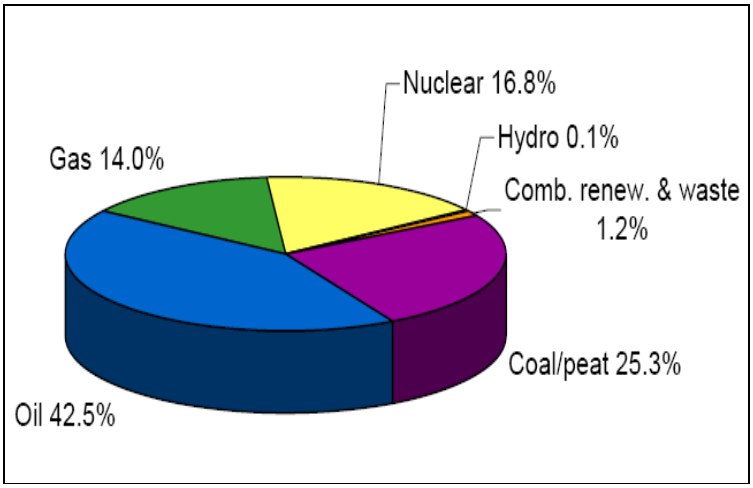
Apart from these technological options and targets, measures are being considered to create economic incentives and regulatory standards that will create a market for demand and supply of renewables. These include economic incentives to increase the use of solar energy in homes and small buildings. To increase the distribution of new and renewable energy, measures such as Renewable Portfolio Standard (RPS) and Renewable Fuel Standard (RFS) will be adopted from 2012. The RPS will require large-scale energy plants to supply new and renewable energy, and the required supply share will be increased annually up to 10 per cent by 2022.

By 2030, a smart grid system will be established comprising a network of electric power suppliers that incorporates advanced control and communication systems to efficiently manage power production and distribution. The information technology-based network would lead to more efficient overall energy production and consumption. Furthermore, it would allow renewable energy sources with variable production rates like solar and wind energy to be better utilized and make a larger contribution to energy supply. This system is expected to drastically reduce CO_2 emissions and contribute to enhancing energy security.

2.3.2. Review

The Korean energy matrix is largely dominated by fossil fuels, accounting for over 80 per cent of total primary energy supply, the remaining consisting of nuclear energy mainly, and a little fraction of renewables (see Figure 6). As such, the new targets for renewable energy generation in the Republic of Korea are an important step forward in reducing the country's reliance on fossil energy and energy import-dependence. Increased use of clean energies will also be critical in order to reduce carbon emissions in the industrial and residential sectors.

Figure 6: Share of total primary energy supply in the Republic of Korea in 2007 (excl. electricity trade)



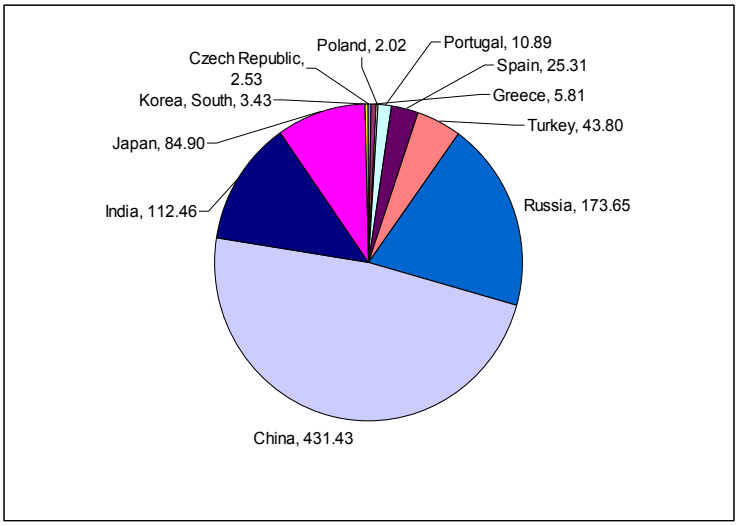
Source: IEA Energy Statistics, 2009.

Measures to improve energy and material efficiency, by converting waste into energy and expanding the potential in energy generated from biomass appear to be encouraging, given that these two sources of energy have shown a potential to increase energy generation from renewable sources. Together with hydroelectricity, they made up the bulk of renewable energy generation, accounting for 95 per cent in the share of renewable energy in 2005.

However, despite the importance of hydroelectricity in the Republic of Korea's renewable energy supply, the volume of hydro-electricity generation remains relatively low when compared with the installed capacity in many other developed and developing countries (see Figure 7). In its search

for new and cleaner sources of energy, the Republic of Korea could further expand its potential to generate electricity from hydropower.

Figure 7: Net hydroelectric power generation, 2006 (Bn Kw/h)



Source: Energy Information Administration, International Energy Annual 2006.

There appears to be efforts in that direction. As part of the Four Major Rivers Restoration project, there are plans to construct 42 hydroelectricity generating plans. These 42 hydroelectric plants with a total cost of around US$ 163 millions are expected to generate 278,471 MWh per year. In addition to expanding the share of hydropower in total energy use, this will contribute to reducing about 150 thousand tons of CO_2 and replace 470 thousand barrels of oil for power generation per year.

To respond to the increasing energy demand, Korean authorities plan to expand nuclear energy supply and also improve infrastructure and continuous development of capacities in accordance with the results of regular safety assessments. The Republic of Korea is the world's sixth largest generator of nuclear electricity, accounting for 4.8 per cent of global generation[16].

In its 2006 Energy Policy Review of the Republic of Korea, the International Energy Agency concluded that Korea's nuclear energy industry is a model for other countries. The report noted that the nuclear energy regulatory framework implemented by Korea is comprehensive and in line with best international practices[17].

Overall, there appears to be an increased interest in nuclear power generation in OECD countries, in large part as a result of policies to address climate change. The IEA projects in its 450 ppm scenario that nuclear power along with renewable energies will have increased shares in the total global energy mix by 2030[18].

Typically, a number of environmental and social concerns arise with respect to the development of nuclear energy. They range from safe storage and long-term disposal of nuclear waste to risk of proliferation of nuclear weapons. The specific procedures for further developing nuclear energy should carefully consider these issues and devise ways to address them in a manner compatible with agreed international norms. Cautious and diverse measures to strengthen public trust on nuclear energy should also be considered. In addition, it is important to ensure that further development of nuclear energy continues to remain in line with best international standards, and that transfer and export of nuclear energy technology contributes to enhancing the safety, stability, and economic viability of nuclear power generation in other countries pursuing nuclear power options.

The rapid expansion in tidal power will add to the country's renewable energy supply. In addition to tidal power plants that are operating in Shiwa Lake, new plants are being proposed at Incheon/Ganghwa Bay and Garorim Bay. These proposed sites have large tidal ranges, up to 9 meters, with extensive areas of intertidal mudflats that are of high ecological value, especially for waterbirds, in addition to their importance as fishery grounds. The tidal-flats around Incheon/Ganghwa include nationally designated protected areas such as the Republic of Korea's Natural Monument No. 419 under the title of "Ganghwa tidal flat and Black-faced Spoonbill Breeding Sites." The Republic of Korea has recognized the importance of natural resources such as tidal flats and bays in its 4th National Report under the Convention on Biological Diversity[19]. In pursuing efforts of conservation of such valuable ecosystems, the construction of the tidal power plants demand a careful assessment of its possible negative effects and ways to mitigate them.

In 2002, the Republic of Korea adopted a fixed minimum price for renewable energy, which contributed to increase renewable energy use. New measures to regulate energy pricing and offer incentives for clean energy generation are important steps in creating an environment conducive to behaviour change and investment in clean energy. The launching of a RPS with attracting private investment and market based mechanism is an innovative trial. The experience in other countries could provide useful insights for the Republic of Korea's efforts in this direction.

Overall, the target of achieving 3.78 per cent share of renewable energies in 2013; 6.08 per cent in 2020, and 11 per cent in 2030 appear to be modest in comparison with targets that exist in many comparable developed countries. However, the pace of change that is envisaged is remarkable considering that the country had increased its renewable energy supply only by 0.37 per cent in the past, from 2.06 per cent in 2005 to 2.43 per cent in 2008.
In order to achieve the target of 11 per cent of renewable energy supply by 2030, the implementation of policies and measures set in the Five-Year Plan will be essential. In addition, to expand renewables in mid- and long-terms, new renewable technology development and fostering the industry are very critical. In this sense, national strategic technology development assistants in solar, wind, fuel cell, bio energy sectors should be increased further.

2.4. Transport, Cities and Fuel Efficiency

The Intergovernmental Panel on Climate Change (IPCC) has indicated that the global vehicle fleet's fuel economy needs to improve by 50 per cent by 2050 to stabilize emissions from road transport[20]. The Global Fuel Economy Initiative (GFEI) launched by UNEP, together with the International Energy Agency, FIA Foundation (Fédération Internationale de l'Automobile), and the International Transport Forum, seeks to double the fuel economy, in line with IPCC and G8 recommendations. As the world's fifth largest car manufacturer, the Republic of Korea has an important role to play in enabling greater efficiency in the automobile industry and significantly reducing emissions from the transport sector.

2.4.1. Korean Green Growth plans and objectives

The Five-Year Plan sets regulatory standards on fuel efficiency and GHG emissions from the transport sector that will require a redesign of cars to either drive 17 kilometres per litre or cut greenhouse gas emissions below 140 grams per kilometre between 2012 and 2015. New fuel efficiency and emission rules will be applied to 30 per cent of automobiles sold in 2012, rising to 100 per cent by 2015.

Efforts are being made to develop renewable transport fuels. In this regard Korea plans to adopt a renewable fuel standard (RFS), which will make it mandatory for transport fuel suppliers to provide bio-diesel, bio-ethanol, and bio-gas for automobiles. Fuel suppliers will have to supply 3 per cent of their transportation fuel from bio-diesel sources by 2012, and 7 per cent in 2020.

An investment of 25.3 trillion won (US$ 19.7 billion) in green cities and further development of railway and other means of mass transport are expected to increase the role of public transportation to 55 per cent of total transport use by 2013. The passenger transport load of trains is set to increase from 19 per cent in 2009 to 30 per cent in 2013.

Bicycle use will be promoted with the construction of 3,114 km of additional bicycle lanes nationwide between 2009 and 2018. About 1,700 km of bicycle lanes will be constructed along the waterfront pavements of the four major rivers. It is anticipated that this would increase the use of bicycles from 1.5 per cent in 2009 to 5 per cent of the modal split in 2013.

2.4.2. Review

The transport sector accounts for 21 per cent of energy consumption in Korea, with an average annual increase rate of 6.3 per cent. The number of vehicles is at 17 million, and increases by 13 per cent a year[21]. Policies and measures to enhance sustainability in the transport sector are therefore critical to promoting green growth.

In July 2006, the Korean government set long-term sectoral energy consumption reduction goals of reducing emissions by 7 per cent in the transport sector and by 6 per cent in the building sector by 2020, as compared with projected emissions[22]. The Five-Year Plan seeks to expand that effort with additional strategies and standards in the transport and construction sectors.

The effort by the Korean Government to orient its car industry into technology, rather than cost-driven, competition is considered to be an important strategic direction. As a leading car manufacturer, expanding investment in the development of low-carbon vehicles such as hybrid cars and electric vehicles deserve to be a high priority in Korea. Around US$1.80 billion was allocated to the promotion of low carbon vehicles in the Korean stimulus plan. In order to realize the full potential of greening the automobile industry, specific policies and measures will need to be defined, including the development of a smart grid system by 2013 as well as specific policies and measures to encourage plug-in hybrid and electric vehicles.

There appears to be an effort in modal shift towards non-motorized transport systems with the construction of over 3000 km worth of cycling lanes. Experience suggests that to be effective, non-motorized transport facilities such as cycling lanes need to be integrated into a larger network of non-motorized transport, public transport, and private vehicle. The creation of a long segment of bicycle lanes along the waterfront pavements of the four major rivers can promote sustainable forms of transportation in recreational activities. However, the larger potential, in particular for mitigating climate change, lies in a cycling network that allows users to use bicycles instead of personal cars for commuting for work, schooling and other urban mobility uses. Without the integrated planning of cycling lanes within the larger transport infrastructure, the full potential of promoting low-carbon transportation may not be realized.

In the building sector, the retrofitting of the existing buildings stock has proved to be an effective way of reducing energy consumption in the residential sector and improve material efficiency. There are also important opportunities for new employment. In Germany, for instance, a programme on retrofitting the existing housing stock to improve energy efficiency has succeeded in retrofitting over 200,000 apartments, creating 25,000 new jobs and sustaining 116,000 existing jobs[23]. In its stimulus package, Korea has allocated US$ 6.19 billion to improving energy efficiency in buildings. The development of green buildings is also part of the 27 priority green technologies (discussed below).

Currently available advanced building technologies can reduce residential energy use by 80 per cent compared to traditional designs[24], while simple adoption of common technologies such as insulation can reduce energy with an estimated 30 per cent at a net negative life cycle cost. Experience from around the world indicates that, due to the fragmentation of the building sector, economic incentives are comparatively ineffective as compared to "command and control" measures such as green building standards and utility-demand control programmes. The Republic of Korea announced a GHG reduction target of 31 per cent by 2020 for the building sector. There are encouraging targets of strengthening energy standards by 30 percent till 2012, achieving passive level by 2017, and reaching zero-energy housing by 2025.

2.5. Water and Ecological Infrastructure

Amid rapid economic growth and high population densities, Korea continues to face challenging water-related issues. A 2006 Environmental Performance Review of Korea undertaken by the OECD[25] concluded that much work must still be undertaken to reach the country's water quality objectives for rivers and reservoirs. Biochemical oxygen demand remains the primary focus of these management efforts, while heavy metals and persistent contaminants have not so far received much attention. Moreover, the protection of aquatic species and biodiversity requires proactive management.

Water scarcity is another challenge facing the Republic of Korea. Water scarcity becomes most acute when one considers demand and supply in the context of future socio-economic and natural changes that may occur. The socio-economic factor with the greatest potential impact is population growth; the natural factor of greatest concern is climate change.

With global warming likely to continue, levels of flooding and drought are expected to worsen. In Korea, it is expected that the level of precipitation during the summer months will increase with almost no change of level in the winter. As temperatures are also projected to rise with global warming, more severe droughts may occur in the winter.

The recurrence of flooding has significant costs to the Korean economy, some of which could have been saved by investing in disaster prevention measures. The annual flood damage was estimated at 170 billion won (US$ 132.3 million) in the 1970s. It reached 2.7 trillion won (US$ 2.1 billion) since the 2000s. The Republic of Korea currently spends an average of 5.3 trillion won (US$ 4.3 billion) as annual investment in flood prevention and recovery expenses.[26] In order to weather expected climate irregularities, additional water control policies will likely be necessary.

2.5.1. Korean Green Growth plans and objectives

In response to these challenges, the Five-Year Plan includes a project on the restoration of the Republic of Korea's four major rivers. The Four Major Rivers Restoration Project was first announced as part of the "Green New Deal" policy launched in January 2009. It was later included in the Five-Year Plan released in July 2009. Its funding, a total of 22.2 trillion won (US$ 17.3 billion), is reflected in the Five-Year Plan total investment[27].

The Four Major Rivers Restoration Project concerns not only the four main rivers – Han, Nakdong, Geum and Yeongsan – but also a number of related projects on tributaries**.** The overall project consists of three sets of projects: 1) the main project – the Han, Nakdong, Geum and Yeongsan rivers restoration projects; 2) projects on the 14 tributaries of the four major rivers; and 3) maintenance of local rivers and other small rivers that directly inflow into the four major rivers. These projects have five key objectives: 1) securing abundant water resources against water scarcity; 2) preparing well-coordinated measures for flood control; 3) improving water quality and restoring ecosystems; 4) creating multipurpose spaces for local residents; and 5) promoting regional development centred on rivers.

The Four Major Rivers Restoration Project will aim at securing sufficient water volume by building 16 weirs. These 16 weirs are expected to secure 800 million cubic meters of water. The project will increase peak water levels of 96 agricultural reservoirs so as to secure 250 million cubic meters of water. Additionally, the construction of 3 small and medium size multipurpose dams is expected to yield another 250 million cubic meters of water.

Flood control measures involve an expansion of the water gates of tributaries, which would allow a quick water level decline and fast draining of flood. In addition, 2 flood-control areas and 3 underflow areas of river sides will together expand the flood control capacity up to 920 million cubic meters of water.

Additionally, the project seeks to ensure that, by 2012, 86 per cent of river reaches should maintain water quality (BOD less than 3ppm) by expanding sewage treatment facilities and establishing green algae reduction facilities. In terms of adaptation strategies to climate change and sea level rise, federal and local governments are bound to maintain an adequate level of salinity concentration to protect drinking water supply and other water usages. In order to monitor water quality, Korea's Ministry of Environment has expanded the existing Tele-Monitoring System (TMS) to 586 sewerage and waste water treatment facilities by the end of 2009. This includes 323 sewerage facilities, 58 waste water treatment facilities, and 205 operating sites.

On ecosystem restoration, an Eco-river Restoration Programme (ERP) initiated in 2008 is being implemented in the context of the Four Major Rivers Restoration Project. One of the ultimate goals of the programme is to restore indigenous and endangered aquatic species and maintain the quality of water and ecosystems. The other national programme to restore freshwater ecosystems is to develop an aquatic ecosystem-monitoring network. Since 2007, preliminary field surveys have been conducted at more than 540 locations. More than 929 km of national streams will be restored as part of the Four Major Rivers Restoration Project. A follow-up project will be planned by 2010 to restore about 120 local streams. More than 84 riparian wetlands will also be

reconstructed. Riparian areas will be afforested or reforested, and will also be used for biomass production.

Finally, the project seeks to support regional economic development. This is pursued through the creation of multipurpose spaces for cultural and touristic activities near rivers which are expected to contribute to job creation and local economic revitalization. Overall, it is expected that the project will create 340,000 jobs and generate an estimated 40 trillion won (US$ 31.1 billion) of positive economic effects.

The implementation of the project follows three phases. In phase 1, approximately 16.9 trillion won (US$ 13.1 billion) will be spent on the "main project" dredging operations, and building weirs, small dams and embanking reservoirs on the four major rivers. Most of the main projects are planned to be completed by 2011; projects for small dams and reservoirs for storing water will be completed by 2012. In phase 2, another 5.3 trillion won (US$ 4.1 billion) will be invested on improving water flow and sewage systems of tributaries. Projects for the development of Seomjin River and other tributaries to the four rivers would be completed by 2012. Phase 3, includes restoring local and small rivers, and developing cultural and tourism attractions around the four major rivers. The Ministry of Culture, Sports and Tourism is involved in this phase.

The Office of National River Restoration under the Ministry of Land, Transport, and Maritime Affairs is the lead agency for the project. In the implementation of the project, the office will operate in cooperation with the Ministry of Culture, Sports and Tourism, the Ministry for Food, Agriculture, Forestry and Fisheries, the Ministry of Environment and the Ministry of Land, Transport and Maritime Affairs.

The Korean government conducted an environmental impact assessment (EIA) of the Four Major Rivers Restoration Project in order to assess the potential effects of the project and to devise response measures. The results of the EIA were announced on November 6, 2009[28].

On ecosystems, the assessment identified around 68 legally designated protected species and natural treasures that may be affected by the Four Major Rivers Restoration Project. The assessment concluded that direct impacts would be minimal if mitigation measures are implemented. Measures planned include an adjustment and reduction of the intensity of the construction work during the winter time when migratory birds arrive. Small size habitats such as small rivers corridors and food places will be created to provide sanctuaries and places for laying eggs. In addition, green belts will be constructed to provide additional habitats for animals to live in a natural environment.

With regard to the natural environment, the assessment mainly addressed potential risks to wetlands that surround the four rivers. It was found that out of 100 wetland sites located in the project area, 54 wetlands may be directly or indirectly affected by the project. These 100 wetlands cover 12.5 per cent of the total area which will be affected by the project. Considering ecological functions of the wetlands, the Korean Ministry of Environment decided to conserve wetlands that have high ecosystem value. Parts of the wetland areas that are likely to be affected are compensated for through the construction of man-made wetlands. As a result, after the four major rivers projects, in total 84 alternative or new wetlands are expected to be created and ecological and environmental functions of the rivers are expected to be improved. In addition,

lower river ways will be created with mild slopes of 1.5 ratio so as to lead to a natural creation of wetland areas after the completion of the projects.

Regarding water quality, Korea's National Institute of Environmental Research, which was entrusted with an assessment of water quality, concluded that water quality will generally be improved as a result of the project. It has been estimated that pollution from mud that may occur during the construction phase will not lead to weighted density (by standard of dry season) of more than 10 mg/litre. In the case that floating matters exceed 15 mg/litre, it is planned that the construction period and intensity will be adjusted and that additional pollution reduction facilities will be installed. As 570 million of cubic meters of dredged materials will result from the dredging of the rivers, there is plan to create a sedimentation basin and a diversion waterway will be installed at the storage yards of the dredged material in order to prevent secondary water pollution. The Korean government is considering options for a differentiated use of the dredged material according to the grain size and the level of contamination.

The Korean Ministry of Environment has the responsibility to ensure follow-up and implementation of the conclusions of the IEA. In that process, the existing Environment Evaluation Board will be transformed into a Post-management Investigation Commission after a re-composition of its membership. The future Post-management Investigation Commission will be entrusted with monthly investigation, monitoring and inspection of the implementation of measures to mitigate identified environmental effects.

2.5.2. Review

Challenges facing Korea in relation to climate change and its impact on rainfall, flooding and water are indeed serious. The Four Major Rivers Restoration Project seeks to respond to these challenges. It is expected to bring numerous positive effects by providing significant ecological infrastructures for the national economy and people's lives. However, a prudent ecological approach is necessary given the significant scale of the project, and the fact that the four major rivers are sensitive ecosystems.

In line with the significance of the challenges that it seeks to address, the Four Major Rivers Restoration Project is a large project involving among others the building of 16 new weirs on the main streams of the four rivers and 2 new dams on their tributaries; the renovation of two estuarine barrages; the embankment of 87 existing irrigation dams; the strengthening of 377 km of river bank; and the dredging of 570 million cubic meters of sand and gravel from a total 691 km of the rivers. These imply major infrastructural work in the implementation of the project.

Therefore, the attempt of ecological restoration of the four main rivers and their tributaries is commendable, but its implementation needs to follow approaches that will result in effective "ecological restoration" by making efforts to enhance the ecological integrity of river in order to achieve the important policy objectives pursued under this project. The study on The Economics of Ecosystems and Biodiversity's (TEEB) review of a large number of restoration projects suggests that resilience improvements can be found in three significant areas of adaptation: (1) freshwater security; (2) food security (both artisanal fisheries and small farms productivity); and (3) natural hazard risk management (cyclones, storms, floods, droughts). An ecosystem-based adaptation could yield many of these benefits in the context of the Korean river restoration.

The Republic of Korea showed commitment to international efforts to protect and conserve wetlands by hosting the 10th Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands in 2008. Many of the resolutions and other outcomes of that conference, including Resolution X.19 "Wetlands and river basin management: consolidated scientific and technical guidance"[29] and Resolution X.24 on "Climate change and wetlands," are relevant instruments to consider[30].

The follow-up and implementation of the conclusions and recommendations of the EIA done by the Ministry of Environment are also critical to ensure environmental integrity of the project. In addition, it is important that communication with relevant stakeholders continue to be strengthened in order to achieve an effective implementation of measures identified through the EIA and to develop appropriate measures for unexpected environmental impacts.

2.6. Green Technologies as Future Growth Engines

Technology is a crucial factor in promoting green growth. In the Korean green growth strategy, the development of green technologies is conceived as the pillar of the country's economic transformation in the medium and long-term, after a first phase of investment in large infrastructure projects as part of the Green New Deal.

2.6.1. Korean Green Growth plans and objectives

The technology component of the green growth plan was derived from a "Strategy for New Growth Engines" announced by the Korean Government on 13 January 2009. The "Strategy for New Growth Engines" was reclassified as a part of the five-year green growth plan, focusing on 27 core technologies. These 27 technologies are considered to have a potential to provide new engines for growth to the Korean economy. They are divided into four categories: (1) technologies for short-term intensive investment, (2) technologies for mid-term intensive investment, (3) technologies for long-term intensive investment, and (4) technologies for long-term gradual investment (see Table 4).

To achieve this technological transformation, a substantial investment plan has been put in place, covering phases from research and development, deployment to commercialization of the technologies. A total investment of more than 2.8 trillion won (US$2.2 billion) is earmarked to fund research and development up to 2013.

Projects in the area of information technology (IT) will contribute to enhancing the use of IT in the economy and society. Investment in such projects will amount to about 4.2 trillion won (US$ 3.3 billion) by 2013. The Presidential Committee on Green Growth estimated that the projects would generate 7.5 trillion won (US$ 5.8 billion) in production, create 52,000 jobs during 2009-2013, and reduce 18 million tons of carbon emissions in 2013.

The "greening" of key industries in the Korean economy is another important aspect of the envisaged technological shift. This involves a transformation of production processes in the steel, fibre and textile, petro-chemistry, and the shipbuilding industries to increase resource and energy efficiency. The Korean Government is focusing its efforts in this regard on investment in research and development and facility upgrades.

Table 4: List of 27 core technologies in Korea green growth national plan		
Sector	**27 Core Technologies**	
Climate change	1. Monitoring and modelling for climate change	(4)
	2. Climate change assessment and adaptation	(4)
Energy source technology	3. Silicon-based solar cells	(1)
	4. Non silicon-based solar cells	(4)
	5. Bio-energy	(4)
	6. Light water reactor	(1)
	7. Next-generation fast reactor	(3)
	8. Nuclear fusion energy	(3)
	9. Hydrogen energy R&D	(3)
	10. High-efficiency fuel cell	(3)
Efficiency improvement technologies	11. Plant growth promoting technology	(3)
	12. Integrated gasification combined cycle	(3)
	13. Green cars	(2)
	14. Intelligent infrastructure for transportation and logistics	(4)
	15. Green city and urban renaissance	(3)
	16. Green building	(3)
	17. Green process technology	(2)
	18. High-efficiency light-emitting diodes / Green IT	(1)
	19. IT-combined electric machines	(3)
	20. Secondary batteries	(2)
End-of-pipe technology	21. CO_2 capture, storage and processing	(3)
	22. Non- CO_2 processing	(2)
	23. Assessment of water quality and management	(2)
	24. Alternative water resources	(2)
	25. Waste recycling	(2)
	26. R&D in monitoring and processing of hazardous substances	(3)
R&D in Virtual Reality	27. Virtual reality	(2)
(1) Technologies for short-term intensive investment; (2) Technologies for mid-term intensive investment; (3) Technologies for long-term intensive investment; and (4) Technologies for long-term gradual investment.		

By 2013, the government plans to build "Green Industry Complexes," which will mainly use waste resources, green power, biomass, and other new and renewable energy sources. Finally, the government will encourage green partnerships between large and small and medium-sized companies. It is envisaged that this green partnership between the large companies and SMEs will help accelerate the development of advanced technologies for fuel efficiency and emissions reduction.

There is an effort to develop a set of cutting-edge technologies, which have the potential to promote growth in service industries and minimize impact on environment and natural resources.

These include robotics, Advanced Nano Products (ANP), IT-convergence high-tech products, biomedicines, and the telecommunications and information technologies and broadcasting services. Over the next five years, a total of 10.9 trillion won (US$ 8.5 billion) will be invested to cultivate development of these industries. In the area of telecommunication and broadcasting services, the Korean Government expects to increase the amount of exports by more than two-fold from US$ 52 billion in 2008 to US$ 123.7 billion in 2013.

2.6.2. Review

Industry accounts for a large part of the Korean economy, in proportions that are much higher than in other OECD countries. A technological transformation that reduces the carbon intensity of industry, in particular in Korea's manufacturing sector, must be a core component of a green growth strategy. There appears to be an approach relying on quick-return technologies, including those able to deliver end-of-the-pipe solutions to pollution and carbon emissions. At least 10 out of 27 core technologies identified are energy, material, and process efficiency improvement technologies. Many of these are specific to the automobile sector, including investment in the development of electric cars and intelligent infrastructure for transportation and logistics.

In the development of new and renewable energy technologies that are dearly needed to reduce the country's reliance on fossil energy, the Republic of Korea appears to be putting a clear emphasis on nuclear, solar photovoltaic and bioenergy technologies. Questions have been raised about the effectiveness of government support to specific industries and technologies, as opposed to promoting innovation based on competition among various possible technologies depending on their technical potential and economic costs and benefits. For example, silicon-based solar cells and non-silicon based solar cells figure among those technologies that will receive support for further development. In its 2006 review of Korea's energy policies[31], the International Energy Agency remarked that support provided for the development of solar photovoltaic through a feed-in-tariff was more than six times that of wind. In this sense, the government is keen on gradually reducing such feed-in-tariffs in certain sectors and is planning to introduce RPS (Renewable energy Portfolio Standard) by 2012. The RPS is expected to generate better competition among the various renewable energy technologies without "picking winners".

It is not self-evident to what extent some of the technologies included in the list of 27 core technologies quality as "green technologies", when referring to parameters such as climate change or carbon and energy-intensity. Certain technologies, including information technologies, virtual reality, and the development of a medicinal service industry, have therefore be considered in the context of a broader policy objective of promoting desirable qualitative growth and further diversification of the Korean economy into a knowledge and service economy.

A clear linkage between investment in the development of green technologies, and the phasing out of support and subsidies to fossil-based and energy-intensive technologies may need to be considered to ensure a consistent approach to technological transformation. To that effect, fiscal reforms that previous reports by UNEP and other institutions have called for need to be reaffirmed (see section on fiscal and policy measure below).

Overall, the development of green technologies is expected to generate 481,000 jobs by 2012 and 1.18 million jobs by 2020. Green technologies are projected to reduce 130 million tons of carbon

dioxide emissions by 2020, which corresponds to around a quarter of the country's' total GHG emission of 594 $MtCO_{2e}$ in 2005.

3. Policy and Fiscal Reforms

In March 2009, UNEP released a report on the "Global Green New Deal"[32], which benefited from contributions from several intergovernmental and civil society organizations and experts. The report underscored the central importance of reform in the international and domestic policy architecture, in order to provide the enabling conditions for the emergence of a green economy. It recommended domestic policy reforms to substantially reduce carbon-inducing or regressive subsidies (e.g. fossil fuels) and instead to create positive fiscal and other incentives and appropriate taxes to encourage a greener economy. Domestic reforms were also discussed in order to deal with some common issues in land use and urban policy, public transport, and the pricing of carbon.

The Global Green New Deal report encouraged governments and other decision makers to capitalize on the historic opportunity presented by the financial and economic crisis by refocusing public spending and private investment in green economic sectors, such as green construction, renewable energies, sustainable transport, and water management. The report argued that an investment of 1 per cent of global GDP (i.e. approximately US$ 750 billion) over the next two years could provide the critical mass of green infrastructure needed to reduce carbon dependency and to generate a significant greening of the global economy.

3.1. Korean Green Growth plans and objectives

The Republic of Korea's green growth strategy includes a range of measures towards policy, regulatory and fiscal reforms aimed at supporting a transition to a green economy. The Five Year Plan attempts to provide policy signals on the effective control of carbon emissions. It contains measures to enhance energy and resource efficiency and to address ecosystem degradation. Climate change mitigation and adaptation, energy security, resource efficiency and waste management, water supply and water quality, flood control, and green technological innovation would be some of the measurable outcomes, were the plan to be successfully implemented.

The Korean Government has committed to injecting into the greening of its economy a total of 107.4 trillion won (US$ 83.6 billion) between 2009 and 2013. This represents 2 per cent of the Korean GDP and is twice the amount of investment suggested in the UNEP report.

The investment plan for Green Growth projects was developed in close collaboration with relevant government agencies, in particular the Korean Ministry of Strategy and Finance. The Ministry of Ministry of Strategy and Finance has given assurance that funding for green growth projects will be given priority over other funding, in order to enable a swift implementation[33].

Carefully tailored, time-bound, and targeted fiscal and financial incentives are recognized as essential in facilitating the transition towards a green economy. A range of incentives are to be offered for private sector investments. These include tax benefits to individual investors, the issuance of long-term and low-interest green bonds and savings, and the creation of a green fund aimed at facilitating access to credit by small and medium-sized enterprises. Individual investors

will also be given tax exemptions on their interest income from "green bonds" and other financial products to be issued by banks. Credit guarantees for green projects will increase from 2.8 trillion won (US$ 1.9 billion) in 2009 to 7 trillion won (US$ 5.4 billion) in 2013. In addition, the government seeks to mobilize investment from pension schemes and to launch a green private equity fund.

3.2. Review

The OECD's 2006 Environmental Performance Review of Korea noted that environmental expenditure in Korea – covering expenditure for pollution abatement and control, public water supply and nature protection – reached over 2 per cent of GDP, "a relatively high level by OECD standards". The 2 per cent of GDP announced for the green growth plan represents a good indication of an effort to mobilize a sizable amount of resources for investment in green sectors and a significant re-orientation of resource allocation.

There are preliminary indicators that the Korean private sector is supportive of these initiatives. A survey of 300 Korean companies undertaken by the Federation of Korean Industries revealed that 70 per cent of the companies supported the green growth strategy and expected the strategy to improve the economy. Moreover, 41.4 per cent of the surveyed firms expressed a willingness to make investments in green growth projects. Similarly, the Korean Chamber of Commerce and Industry (KCCI) has, in general, expressed support for the government's road map[34].

The fiscal measures and incentives designed in the Korean Green Growth plan are instrumental in mobilizing green investments and can be expected to yield environmental benefits that would contribute to addressing national and global environmental challenges, while enhancing the quality of life and well-being of the Korean people. The Korean Presidential Committee on Green Growth estimates that spending US$ 83.6 billion on the Green Growth plan would stimulate production worth between US$ 141.1 billion and US$ 160.4 billion during 2009-2013 and create between 1.18 and 1.47 million jobs.

Policy and fiscal measures contained in the green growth plan are encouraging, but they need to be complemented with further reforms, particularly in sectors that consume natural capital and contribute to ecological scarcity (e.g. resource extraction and polluting activities). The Republic of Korea's indicators of carbon and energy intensity remain among the highest in the OECD. While important efforts are being made and more action is announced to enhance energy efficiency, these need to be complemented with further reforms of energy pricing, subsidies, and taxation.

The Green Growth plan envisions a reform of energy pricing to reflect full cost, which represents a step forward. However, there does not appear to be a major attempt at reforming energy subsidies that keep distorting energy markets. A UNEP report that examined Korea's energy pricing and taxation policy concluded that reforming energy subsidies and the system of energy taxation could yield environmental gains with minimal potential adverse social and economic effects[35].

Following a trend common in most OECD countries, the share of agriculture in the Korean economy decreased from 9 per cent of GDP in 1986-88 to below 3 per cent of GDP in 2006-2008. However, the Republic of Korea remains among the countries with the highest rate of producer support as a percentage of GDP within the OECD (nearly three times the average percentage of

support in the OECD)[36]. Korea's CO_2 emissions and use of energy relative to its GDP and land area are among the highest, while its use of pesticides and chemical fertilizers are the highest among OECD countries. Agricultural subsidies not carefully targeted may continue to support unsustainable forms of production and run counter to the social, economic, and environmental policy goals of the Green Growth strategy.

Subsidies in the fishery sector continue to be a matter of concern. The 2006 Review by the OECD noted that the doubling of budgetary transfers to fishery policies since 2000 was mainly to preserve the marine environment. A recent Review of Fisheries in OECD Countries Policies found that half of transfers in 2004 (US$ 562 million) were used for fisheries infrastructure, such as the improvement of fishing ports; 10 per cent for resource enhancement; 10 per cent for the improvement of fish farms; and 10 per cent for the modernisation of fish markets[37]. However, it is also understood that in certain cases, fisheries subsidies meant for environmental conservation purposes may directly or indirectly contribute to over-capacity and over-fishing and should therefore be designed and implemented with caution.

In addition, where countries have succeeded in establishing effective fishery management regimes at the domestic level, distant fishing, in which Korea is involved through fishery access arrangements, presents a risk that excess capacity is transferred to other fishing grounds that often lack effective management regimes. The net effect is growing pressure on global fishing stocks that inhibit efforts to achieve a sustainable level of fishing at the global level.

4. Institutional Process and Participation

The Republic of Korea formulated its green growth strategy by relying on an institutional approach that leverages on existing as well as new structures within government. There is an ongoing effort to involve other actors in the private sector, academia and civil society; as well as measures aimed at fostering education, awareness and behavioural change among the general public.

4.1. Korean Green Growth plans and objectives

The planning and formulation of the Republic of Korea's Green Growth strategy and its five-year plan has brought about an inter-agency process that involves all government ministries. The Presidential Committee on Green Growth, established in 2009, is a fundamental pillar of this institutional set-up. With representatives from all government ministries, the private sector, academia, and civil society, the Committee has met four times since its creation and before the release of the Five-Year Plan for Green Growth.

At each ministry, a Chief Green Officer, generally at Director-General level, is the designated focal point for interacting with the Committee. Korea Environment Institute, Korea Institute for Industrial Economics and Trade, Korea Institute of Public Finance, and scholars from economics and environment circles participated in the formulation of Korea's Green Growth strategy.

Korean policy makers have sought to foster understanding and awareness of the objectives of the Green Growth strategy among the general public and to induce public action to support those objectives. Educational programmes have been developed, that focus on providing information

and raising awareness to encourage behavioural change in daily consumption patterns. Measures in this area include the expansion of a "carbon labelling system" started in January 2009 and the launching of a new "green lifestyle index".

Box 2: Carbon labelling system in Korea

Since July 2008, the Korean Ministry of Environment has conducted a pilot project of carbon labelling on ten categories of products in order to promote low-carbon consumption. The carbon-labelling scheme was fully launched in January 2009. The purpose of the scheme is to show the overall amount of carbon dioxide and other greenhouse gases associated with the life-cycle of a product including production, distribution, use and disposal. Korea's Eco-Product Institute under the Ministry of Environment is in charge of the certification of low-carbon products. Manufacturers apply for the certification on a voluntary basis.

Changes in consumption patterns are also being promoted within government and the private sector. The Republic of Korea has adopted a green procurement law (the Green Consumption Enhancement Act) to increase the consumption of environmentally-friendly products by central and local government agencies. Private consumption of eco-friendly products is promoted through a "Carbon Cash-back System", which grants "carbon points" to consumers purchasing low-carbon products. Carbon points can then be exchanged for concessions at public facilities.

Additionally, a Carbon Point System is promoted to encourage households to save energy, water, and gas. About 400,000 households were participating in this program as of October 2009. There is an effort to stimulate the production of environmentally-friendly goods so as to supply products that respond to changing consumers choices. In that regard the Korean government plans to double the share of its eco-friendly agricultural products from 4.5 per cent in 2009 to 10 per cent in 2013.

4.2. Review

In the follow-up to the United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil, in 1992, and the adoption of Agenda 21, Korea established a Presidential Committee on Sustainable Development. The Committee included representatives of government, the private sector, academia, and civil society. It was seen as an innovative approach to promote multistakeholder involvement in the formulation and implementation of environment and sustainable development policies and was heralded by the United Nations in its review of the implementation of Agenda 21.

The new Presidential Committee on Green Growth established as an institutional mechanism for the Green Growth Strategy is structured following a relatively similar model. There is an indication that this policy and institutional process has contributed to streamlining government action. Green growth related projects that were planned under the different ministries were integrated in ways that would enable focused policy direction and provision of financial and fiscal support in a more effective manner. For example, the Korean Ministry of Strategy and Finance reported that in 2008, 267 Green Growth-related projects were submitted by 20 ministries and offices, with a total

budget of 148 trillion won. The green growth planning process resulted in packaging these projects into nine core projects and 27 related industries that form the Green Growth plan.

There appears to be an effort to link the Green Growth strategy with the formulation of a long-term strategy to address climate change. If successful, this would prove that changes in economic systems can simultaneously deliver prosperity and respond adequately to the challenge of climate change.

Beyond central government agencies, there appears to an effort to promote green growth at the local level. Local governments in the Republic of Korea are developing their respective five-year plans on Green Growth, which would translate the national plan into local implementation. It is expected that through such plans, local authorities will be able to tailor green growth projects to the needs and priorities of their constituencies[38].

A series of presentations and public hearings were undertaken to introduce the green growth strategy to the Korean public. The general public and consumers can be significant drivers of change and should be actively engaged in the implementation of the green growth strategy. Further promoting a process of broad-based dialogue and consultation with a cross-section of all stakeholders could prove to be essential for the success of such transformational public policies.

5. Conclusion

Despite remarkable economic progress, the Republic of Korea is still faced with numerous sustainable development challenges that require reforms and innovative approaches in various areas of the economy. The country's energy challenges are enormous, as it imports 97 per cent of its total energy requirements. The rapid industrialization and urbanization have resulted in a significant pressure on the environment and natural resources such as forests and water resources, biodiversity and the urban environment. Freshwater scarcity remains a critical challenge facing Korea.

The Republic of Korea's carbon emissions have increased significantly during the past 15 years, making Korea one of the countries with the fastest growth of carbon emissions. Climate change presents risks of higher levels of flooding and drought, which are already costing the country billions of dollars in damage. Urgent measures are needed to address climate change both with respect to mitigation and adaptation.

In responding to these challenges, the Republic of Korea has embarked onto a major attempt to fundamentally transform the country's growth paradigm from "quantitative growth" to low-carbon, "qualitative growth"; from an economy that is based on extensive growth in labour and capital to an economy driven by investment in natural capital assets, transformational innovations and state-of-the-art technology.

The Republic of Korea responded to the financial and economic crisis in January 2009 with an economic stimulus package equivalent to US$ 38.1 billion of which 80 per cent was allocated to more efficient use of resources such as freshwater, waste, energy-efficient buildings, renewable energies, low-carbon vehicles, and development of the rail network. Beyond this immediate response to the crisis, the Korean Government has initiated a new plan to achieve transformative

change through a Five-Year Plan for Green Growth. The Korean National Strategy for Green Growth has set ambitious goals for addressing climate change, enhancing energy and material efficiency, developing renewable sources of energy, promoting sustainable forms of transportation, investing in water and ecological infrastructure, and promoting a new set of green technologies as future engines of growth. It is significant in size, mobilising over US$ 83 billions or 2 per cent of GDP over five years.

The Republic of Korea is equally taking important steps in the area of policy and pricing reforms by creating a new carbon market, reviewing energy pricing, and expanding incentives for environmentally-friendly businesses and consumer behaviour. The country's unilateral decision to set a national GHG emissions reduction target is an indication of the seriousness of its resolve to respond to the challenge of climate change and to contribute to the global effort to address this challenge.

This report shows that these measures are encouraging steps in creating a policy architecture that could stimulate green investment and contribute to making such investment economically viable. UNEP encourages the stepping up of investment in addressing the key ecological scarcities facing the Korean society and economy, and to fuel a new dynamism that reorients the economy towards a green path of growth and development. To that effect, as outlined in the previous sections of this report, UNEP encourages further policy, regulatory and fiscal reform in order to remove existing policy and market distortions in areas such as energy, agriculture, and fisheries.

UNEP also encourages a careful assessment of the economic, social, and environmental costs and benefits of different strategies, policy options, or choice of projects so as to minimise potentially negative effects and maximise sustainable development gains. In that regard, effective use of environmental and sustainability assessment is warranted, given the scale and nature of certain green growth projects relating to highly sensitive ecosystems.

Achieving the fundamental changes pursued in the Korean green growth strategy requires a strong government commitment, but equally necessitates positive engagement of the private sector and civil society as stakeholders and partners. UNEP encourages a process of broad-based dialogue and consultation with a cross-section of all stakeholders in order to generate the necessary public support that could prove to be essential for the success of such transformational public policies.

6. Annexes

Annex 1: Investment in the Five-Year Plan (2009 – 2013) in billion US$

Category of action plan and policy direction		Amount of investment			
		Total	2009	2010-11	2012-13
		83.6	13.6	37.6	32.4
[1] Measures for climate change and securing energy independence		44.3	6.7	22.7	14.9
	1. Reduce carbon emissions	4.4	0.8	1.7	1.9
	2. Decrease energy dependence on oil and enhance energy self-sufficiency	11.6	2.2	4.4	5.1
	3. Support adaptation to climate change impacts	28.3	3.7	16.7	7.9
[2] Creation of new growth engines		22.3	3.7	8.3	10.2
	4. Develop green technologies as future growth engine	8.8	1.6	3.3	3.9
	5. Greening of industry	3.6	0.6	1.4	1.6
	6. Develop cutting-edge industries	8.5	1.2	3.0	4.2
	7. Set up policy infrastructure for green growth	1.4	0.2	0.5	0.6
[3] Improving quality of life and strengthening the status of the country		21.7	4.0	8.2	9.5
	8. Green city and green transport	19.7	3.7	7.4	8.6
	9. Green revolution in lifestyle	1.5	0.3	0.6	0.6
	10. Enhance national status as a global leader in green growth	0.5	0.1	0.2	0.2
Note: Currency rate (= Korean Won / U.S. Dollar) = 1284.7 (June 30, 2009)					

Annex 2: Investment plan for the Four Major Rivers Restoration Project "Main project" (US$ billion)

Lead ministry	**Investment**				
	Total	2009	2010	2011	2012*
Ministry of Land, Transport and Maritime Affairs	10.6	0.6	4.8	4.7	0.4
Ministry of Food, Agriculture, Forestry and Fisheries	2.2	0.1	0.4	0.8	0.9
Ministry of Environment	0.4	-	0.2	0.2	
Total	13.1	0.7	5.4	5.7	1.3
(Note) Most of the main projects are planned to be completed by 2011. * Building small dams and embanking reservoirs for increasing water storage capacity will be completed by 2012.					

Annex 3: Investment plan for the Seomjin **river and the tributaries to the four major rivers (US$ billion)**

Lead ministry	Investment				
	Total	2009	2010	2011	2012
Ministry of Land, Transport and Maritime Affairs	1.3	-	0.4	0.5	0.4
Ministry of Food, Agriculture, Forestry and Fisheries	0.2	-	-	0.1	0.1
Ministry of Environment	2.6	0.8	0.9	0.5	0.5
Total	4.1	0.8	1.2	1.2	0.9
Note: These projects are planned to be completed by 2012.					

Annex 4: Issues to address in the assessment of the usefulness and feasibility of wetland restoration projects

Assessments for the selection of appropriate wetland restoration projects should include the following questions (adapted from the Annex to Resolution VII.17):
a. Will there be environmental benefits (for example, improved water quantity and quality, reduced eutrophication, preservation of freshwater resources, biodiversity conservation, improved management of "wet resources", flood control)?

b. What is the cost-effectiveness of the proposed project? Investments and changes should in the longer term be sustainable, not yielding only temporary results. Aim for appropriate costs in the construction phase and appropriate running costs for future maintenance.

c. What options, advantages or disadvantages will the restored area provide for local people and the region? These may include health conditions, essential food and water resources, increased possibilities for recreation and ecotourism, improved scenic values, educational opportunities, conservation of cultural heritage (historic or religious sites), etc.

d. What is the ecological potential of the project? What is the present status of the area in terms of habitats and biological values, and in particular will any current features of wetland conservation or biodiversity importance be lost or damaged? How is the area expected to develop with respect to hydrology, geomorphology, water quality, plant and animal communities, etc?

e. What is the status of the area in terms of present land use? The situation will differ widely between developed countries, countries with economies in transition, and developing countries, and within such countries depending on local circumstances, with respect to the objectives of restoration and rehabilitation. In particular, marginal lands yielding few benefits in the present situation can often be improved.

f. What are the main socio-economic constraints? Is there a positive regional and local interest in realising the project?

g. What are the main technical constraints?

Source: Principles and guidelines for wetland restoration (Resolution VIII.16). "Wetlands: water, life, and culture" 8th Meeting of the Conference of the Contracting Parties to the Convention on Wetlands (Ramsar, Iran, 1971) Valencia, Spain, 18-26 November 2002. Box 2. Issues to address in the assessment of the usefulness and feasibility of wetland restoration projects

Annex 5: Other Ramsar Resolutions on the conservation of tidal flats and wetlands

Res VII.21 "Enhancing the conservation and wise use of intertidal wetlands"
http://www.ramsar.org/pdf/res/key_res_vii.21e.pdf

Para. 11: CALLS upon Contracting Parties to document the extent of loss of intertidal wetlands that has occurred in the past and to inventory those intertidal wetlands which remain, and their conservation status;

Para. 14: FURTHER URGES Contracting Parties to identify and designate as Wetlands of International Importance a greater number and area of intertidal wetlands, especially tidal flats, giving priority to those sites which are important to indigenous people and local communities, and those holding globally threatened wetland species, as encouraged by Resolution VII.11; and

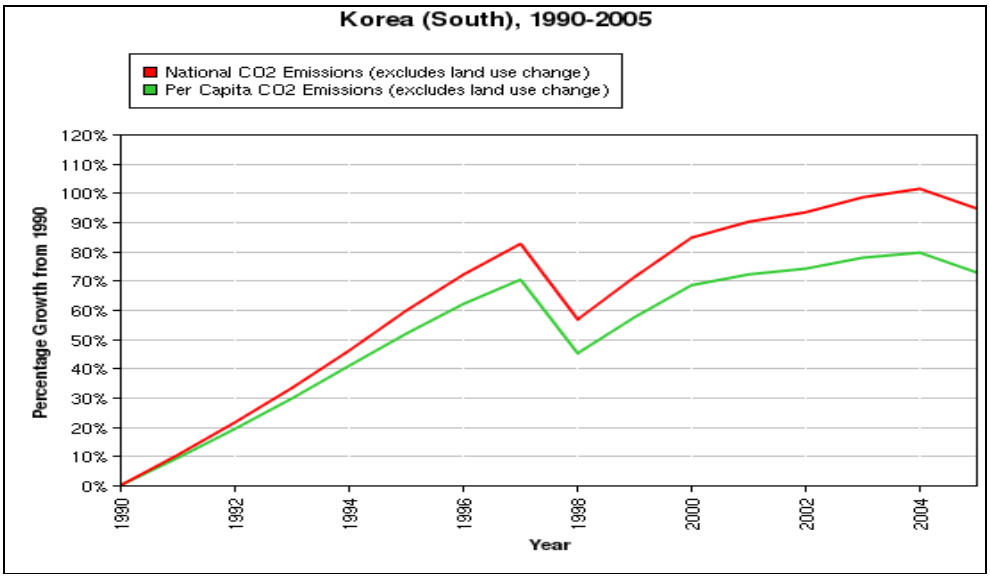
Res X.22 "Promoting international cooperation for the conservation of waterbird flyways"
http://www.ramsar.org/pdf/res/key_res_x_22_e.pdf

Para. 22: WELCOMES the statement by the Republic of Korea to the 35th meeting of Ramsar's Standing Committee that intertidal mudflats should be preserved and that no large-scale reclamation projects are now being approved in the Republic of Korea, and ENCOURAGES all Contracting Parties in their efforts to protect such habitats in future and to monitor them and mitigate any past development impacts on or losses to them.

Res VIII.4 "Principles and guidelines for incorporating wetland issues into Integrated Coastal Zone Management (ICZM)"
http://www.ramsar.org/pdf/res/key_res_viii_04_e.pdf

Para. 14: Urges Contracting Parties to ensure that coastal wetlands and their values and functions for human well-being, including their role in mitigating the impacts of climate change and sea-level rise and their importance for the conservation of biological diversity are fully recognized in planning and decision-making in the coastal zone, including through ICZM initiatives.

Annex 6: National and per capita CO_2 emissions, 1990-2005 (excluding land use change)



Source: World Resources Institute. The Climate Analysis Indicators Tool (CAIT).

ACRONYMS

ANP	Advanced Nano Products
BOD	Biological Oxygen Demand
CAIT	Climate Analysis Indicators Tool
CCS	Carbon Capture and Storage
CH_4	Methane
CO_2	Carbon dioxide
GDP	Gross Domestic Product
EPI	Environmental Performance Index
ERP	The Eco-river Restoration Programme
FIA	Fédération Internationale de l'Automobile
GFEI	The Global Fuel Economy Initiative
GHG	Greenhouse Gas
GND	Green New Deal
H_2	Hydrogen
HFCs	HFCs
IEA	International Energy Agency
ILO	International Labour Organization
IOE	International Organisation of Employers
IPCC	The Intergovernmental Panel on Climate Change
ITUC	International Trade Union Confederation
Kwh	kilowatt hour
LED	Light Emitting Diode
LNG	Liquefied Natural Gas
MLTM	Ministry of Land, Transport and Maritime Affairs
MOCT	Ministry of Culture, Sports and Tourism
MOFAFF	Ministry of Food, Agriculture, Forestry and Fisheries
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation Development's
PFCs	Perfluorocarbons
PPM	parts per million
RFS	Renewable Fuel Standard

RPS	Renewable Portfolio Standard
R&D	Research and Development
SF6	Sulfur Hexafluoride
SMEs	Small and Medium Enterprises
TMS	Tele-Monitoring System
TEEB	The Economics of Ecosystems and Biodiversity
TOE	Ton of oil equivalent
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change

Endnotes

[1] Green Economy: For UNEP, a "green economy" can be defined as a system of economic activities related to the production, distribution, and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks and ecological scarcities. A green economy is characterized by substantially increased investments in green sectors, supported by enabling policy reforms. These investments, both public and private, provide the mechanism for the reconfiguration of businesses, infrastructure and institutions, and the adoption of sustainable consumption and production processes. Such reconfiguration will lead to a higher share of green sectors in the economy, more green and decent jobs, reduced energy and material intensities in production processes, less waste and pollution, and significantly reduced greenhouse gas emissions. While it will be necessary to measure progress towards a green economy, it is counter-productive to develop generic green economy indicators applicable to all countries given differences in natural, human, and economic resources. Rather, focusing on the process of transitioning to a green economy acknowledges that countries will take many different paths in achieving this objective, and recognizes that a green economy in one country may look quite different than a green economy in another country.

Green Jobs: Green jobs reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable. Green jobs can include work in agriculture, industry, services and administration that contributes to preserving or restoring the quality of the environment. Green jobs are found in many sectors of the economy from energy supply to recycling and from agriculture and construction to transportation. They help to cut the consumption of energy, raw materials and water through high-efficiency strategies, to de-carbonize the economy and reduce greenhouse‑gas emissions, to minimize or avoid altogether all forms of waste and pollution, to protect and restore ecosystems and biodiversity. Green jobs play a crucial role in reducing the environmental footprint of economic activity. This reduction is gradual and the different jobs contribute to different degrees. Workers manufacturing fuel-efficient or hybrid cars, for example, contribute less to reducing emissions from transport than those working in public transport systems. Moreover, what is considered fuel-efficient today will no longer qualify in ten years' time. The notion of a green job is thus not absolute, but there are "shades" of green and the notion will evolve over time (see UNEP, ILO, IOE, and ITUC (2008). Green Jobs: Towards decent work in a sustainable, low-carbon world. September, United Nations Environment Programme, accessible at: http://www.unep.org/greeneconomy/GreenJobs/tabid/1377/language/en-US/Default.aspx

[2] The concept of "Green Growth" was first adopted at the "Ministerial Conference on Environment and Development" jointly hosted by the Ministry of Environment of the Republic of Korea and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) in 2005. It was initiated by Republic of Korea, the host country, and included in the outcome of the Conference, "Seoul Initiative Network on Green Growth". Source: Korea Ministry of Environment.

[3] Robins, N., Clover, R. and C. Singh (2009). *Building a Green Recovery*. May. HSBC Global Research, New York.

[4] Robins, N., Clover, R. and C. Singh (2009). *A Global Green Recovery ? Yes, but in 2010*. August. HSBC Global Research, London.

[5] The Republic of Korea Ministry of Strategy and Finance. Briefing on the Green New Deal.

[6] OECD.Stat.Extracts. Key Short-Term Economic Indicators: *Quarterly National Accounts (GDP Constant Prices).* Data extracted on 9 September 2009 at http://stats.oecd.org/Index.aspx?DatasetCode=SNA_TABLE1

[7] The Republic of Korea Ministry of Strategy and Finance. Briefing on the Green New Deal.

[8] 2005 input-output tables, the most up-to-date input-output tables as of 2009, were used in the calculation.

[9] National Emergency Management Agency, Republic of Korea. Accessible at: http://eng.greatkorea.go.kr/1/1-1.asp

[10] IEA (2006) *Energy Policies of IEA Countries: The Republic of Korea. 2006 Review.* Paris: International Energy Agency. http://www.iea.org/textbase/nppdf/free/2006/korea2006.pdf

[11] OECD (2006) Environment Performance Review of Korea. Paris: OECD.

[12] Korea.net, Seoul maps out plans to cut greenhouse gas emissions. 5 August 2009. http://www.korea.net/.

[13] Presidential Committee on Green Growth, Republic of Korea, "Republic of Korea sets its mid-term greenhouse gas reduction goal for 2020". Press Release, 17 November 2009.

[14] The Economics of Ecosystems and Biodiversity: http://www.teebweb.org/

[15] IEA (2009). Key World Energy Statistics 2009. Paris; International Energy Agency.

[16] International Atomic Energy Agency, April 2010.

[17] IEA, 2006. Op. cit.

[18] IEA (2009). *World Energy Outlook 2009*. Executive Summary. Paris: International Energy Agency. http://www.iea.org/Textbase/npsum/weo2009sum.pdf

[19] Republic of Korea Fourth National Report to the Convention of Biological Diversity, May 2009, accessible at: http://www.cbd.int/doc/world/kr/kr-nr-04-en.pdf

[20] FIA Foundation. *50 By 50 – Global Fuel Economy Initiative*. Available at: http://www.fiafoundation.org/Documents/Environment/50by50_leaflet_lr.pdf

[21] Korea Ministry of Land, Transport and Maritime Affairs, http://www.uncrd.or.jp/env/4th-regional-est-forum/Presentations/07_BS2_Korea.pdf

[22] IEA, 2006. Op. cit.

[23] UNEP (2009). Global Green New Deal: A Policy Brief. http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf

[24] UNEP, ILO, IOE and ITUC, 2008. Op. Cit.

[25] OECD (2006) Environment Performance Review of Korea. Paris: OECD.

[26] South Korea Ministry of Land, Transport and Maritime Affairs and the Ministry of Environment, 2009

[27] The initial budget of 16.9 trillion won (US$ 13.1 billion) announced in January 2009 was increased to 22 trillion Won (US$ 17.3 billion) when the Five Year Plan was released in July 2009. Korean officials have explained this increase in the total funding of the project by its expansion beyond the four main rivers and the inclusion of the estuaries to the four rivers.

[28] The Environmental Impact Statement (EIS) was prepared by the Regional Construction Management Administration after collecting opinions from various stakeholders. The EIS includes the anticipated and assessed environmental impacts. The draft was shared with the local residents, environmental organizations, and relevant experts to gather diverse opinions for 20 days. The EIS was then submitted to the Regional Basic Environmental Offices, under the authority of the Ministry of Environment. To verify feasibilities of the EIS, Korea Environment Institute (KEI) and the Environmental Assessment Team comprised of independent experts were entrusted for review of the EIS. The final EIS agreement was set after the opinions of KEI were considered. The final EIS, agreed by the Regional Basic Environmental Offices and the Regional Construction

Management Administration, covers four categories (ecosystem, natural environment, water quality, and others) in short.

[29] Res X.19 "Wetlands and river basin management: consolidated scientific and technical guidance", includes under its Guidelines Box N the following:

N3. Carry out Environmental Impact Assessment (EIA) and Cost Benefit Analysis (CBA) studies for land use or water development projects which may have significant impacts on rivers and wetlands, using independent multidisciplinary teams and in consultation with all stakeholders, and consider alternative proposals including the no-development option; and

N4. Disseminate the findings of any EIA and CBA in a form that can be readily understood by all stakeholders.

[30] This Resolution recognizes the services that wetlands provide to climate change mitigation (Res X.24; para. 1), especially in acting as carbon stores (Res X.24; para. 8).

[31] IEA, 2006. Op. cit.

[32] Barbier, E.B. (2009). A Global Green New Deal. Report prepared for the Economics and Trade Branch, Division of Technology, Industry and Economics, United Nations Environment Programme. Geneva, April. Available at http://www.unep.org/greeneconomy/docs/GGND-Report-April2009.pdf, UNEP (2009). Global Green New Deal: A Policy Brief. http://www.unep.org/pdf/A_Global_Green_New_Deal_Policy_Brief.pdf

[33] Communication from a meeting with representatives of the Presidential Committee on Green Growth, 29 July 2009.

[34] Communication from a meeting with representatives of the Korean Chamber of Commerce and Industry, Business Institute for Sustainable Development on 30 July 2009.

[35] UNEP and United Nations Foundation (2004). Energy Subsidies: Lessons Learned in Assessing their Impact and Designing Policy Responses. http://www.unep.ch/etb/publications/energySubsidies/Energysubreport.pdf

[36] OECD (2009). Agricultural Policies in OECD Countries: Monitoring and Evaluation. Highlights. http://www.oecd.org/dataoecd/37/16/43239979.pdf

[37] OECD (2009), *Review of Fisheries in OECD Countries Policies and Summary Statistics 2008.* Paris: OECD.

[38] In a bid to familiarize central and local government officials with the concept of green growth, the Korean Prime Minister has led a series of 19 lectures on green growth to government officials. Five such lectures were directed at central government officials and 14 to local government officials. Altogether, over 5,000 central and local government officials attended those sessions.

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MITIGATING CLIMATE CHANGE AND DEVELOPING NEW GROWTH ENGINES

Randall S. Jones, Byungseo Yoo

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KOREA'S GREEN GROWTH STRATEGY: MITIGATING CLIMATE CHANGE AND DEVELOPING NEW GROWTH ENGINES

ECONOMICS DEPARTMENT WORKING PAPERS No. 798

by Randall S. Jones and Byungseo Yoo

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ABSTRACT/RÉSUMÉ

Korea's green growth strategy: mitigating climate change and developing new growth engines

Korea's greenhouse gas emissions almost doubled between 1990 and 2005, the highest growth rate in the OECD area. Korea recently set a target of reducing emissions by 30% by 2020 relative to a "business as usual" baseline, implying a 4% cut from the 2005 level. Achieving this objective in a cost-effective manner requires moving from a strategy based on voluntary commitments by firms to market-based instruments. The priority is to establish a comprehensive cap-and-trade scheme, supplemented, if necessary, by carbon taxes in areas not covered by trading. Achieving a significant cut in emissions requires a shift from energy-intensive industries to low-carbon ones. Korea is strongly committed to promoting green growth through its Five-Year Plan, which envisages spending 2% of GDP per year through 2013. One challenge is to ensure that these expenditures are efficiently targeted so as to develop green technologies, while avoiding the risks inherent in industrial policy.

This Working Paper relates to the 2010 *OECD Economic Survey of Korea*
(www.oecd.org/eco/surveys/korea)
JEL classification: Q28, Q48, Q54, Q56, Q58
Keywords: Korean economy; climate change; greenhouse gas emissions; Kyoto protocol; green growth; emissions trading system; environmental taxes; energy subsidies; renewable energy; Clean Development Mechanism; carbon tax; energy efficiency; R&D; green certificates; National Strategy for Green Growth.

Stratégie de croissance verte pour la Corée : lutter contre le changement climatique et tirer parti des nouvelles sources de croissance

Les émissions de gaz à effet de serre ont pratiquement doublé en Corée entre 1990 et 2005, soit la progression la plus forte dans la zone de l'OCDE. La Corée s'est récemment fixé un objectif de réduction des émissions de 30 % en 2020 par rapport au statu quo, ce qui représente une baisse de 4 % par rapport au niveau de 2005. Pour réaliser cet objectif avec le meilleur rapport coût/efficacité possible, il faut passer d'une stratégie reposant sur des engagements volontaires des entreprises à la mise en place d'instruments de marché. La priorité est d'établir un dispositif complet de plafonnement et transfert, complété, si nécessaire, par une taxe sur le carbone dans les secteurs qui ne sont pas couverts par des permis d'émission. Réduire sensiblement les émissions implique de privilégier les industries sobres en carbone par rapport à celles à forte intensité énergétique. La Corée est déterminée à promouvoir la croissance verte via son plan quinquennal, qui prévoit de dépenser à cet effet 2 % du PIB par an jusqu'en 2013. L'un des principaux enjeux est de veiller à ce que ces dépenses soient efficacement ciblées sur le développement des technologies vertes tout en évitant les risques que présente toute politique industrielle.

Ce Document de travail a trait à l'*Étude économique de l'OCDE de la Corée*, 2010
(www.oecd.org/eco/etudes/coree).
Classification JEL: Q28, Q48, Q54, Q56, Q58
Mots clés: économie coréenne ; changement climatique ; émissions de gaz à effet de serre ; Protocole de Kyoto ; croissance verte ; système d'échange de permis d'émission ; taxes environnementales ; subventions d'énergie ; énergies renouvelables ; Mécanisme pour un développement propre ; taxes carbone ; efficacité énergétique ; R-D; certificats verts ; Stratégie nationale pour la croissance verte.

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KOREA'S GREEN GROWTH STRATEGY: MITIGATING CLIMATE CHANGE AND DEVELOPING NEW GROWTH ENGINES

Randall S. Jones and Byungseo Yoo[1]

Korea is strongly committed to promoting green growth. On the 60th anniversary of the founding of the Republic of Korea in August 2008, the President proclaimed "Low Carbon/Green Growth" as the nation's vision to guide development during the next 50 years.[2] In order to implement this vision, the government announced in July 2009 the "National Strategy for Green Growth" up to 2050, which includes mitigating climate change, creating new engines for economic growth and improving the quality of life (Box 1).[3] This paper analyses policies to implement these strategies. Policy recommendations are summarised in Box 3 at the end of the paper.

Mitigating climate change

Climate change is one of the key challenges facing the world in the 21st century with serious environmental and economic implications. While there are significant uncertainties about the cost of inaction, it would undoubtedly be immense as sea levels rise, agricultural yields decline and infectious diseases become more prevalent.[4] Climate change risks unpredictable and irreversible damage worldwide.

In August 2009, the government presented the options of cutting GHG emissions by 21%, 27% or 30% relative to the projected level in 2020, which is based on a "business-as-usual" (BAU) scenario of a 36.9% rise in emissions between 2005 and 2020 (Figure 1).[5] Relative to 2005, the three options imply an 8% increase in emissions, no change or a 4% cut, respectively. After analysing the scenarios on the basis of

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1. Randall S. Jones is head of the Korea/Japan Desk in the Economics Department of the OECD and Byungseo Yoo is a senior economist on that desk. This paper initially appeared as a chapter in the *OECD Economic Survey of Korea* published in June 2010 under the responsibility of the Economic and Development Review Committee. The authors would like to thank Anne Carblanc, Andrew Dean, Alain de Serres, Jane Ellis, Robert Ford, Brendan Gillespie, Vincent Koen, Dirk Pilat and Masahiko Tsutsumi for comments on earlier drafts. Special thanks go to Lutécia Daniel for technical assistance and Nadine Dufour and Pascal Halim for editorial assistance.

2. Korea also pushed for green growth to feature prominently on the agenda of international organisations. In 2005, the "Seoul Initiative Network on Green Growth" was adopted at the Ministerial Conference of the United Nations Economic and Social Commission for Asia and the Pacific. In addition, Korea chaired the 2009 OECD Ministerial Council Meeting that adopted the "Green Growth Declaration".

3. The government set a target of reducing energy intensity by one-third from the 2006 level by 2020, reaching the OECD average. This paper will not explicitly discuss increasing energy independence as it will be a natural consequence of mitigating climate change and shifting to a low-carbon economy.

4. Recent assessments show a permanent 14% loss in average world consumption per capita from both market and non-market impacts (Stern, 2007).

5. The BAU baseline makes assumptions on oil prices (from the Energy Information Agency), population (official projection) and economic growth (Korea Development Institute).

Korea's capacity to make reductions and the subsequent macroeconomic impact, the Cabinet selected the most ambitious option of a 30% reduction by 2020 relative to the BAU baseline, despite the industrial sector's concern about the possible negative impact on their international competitiveness. The 2020 targets for Japan, the United States and the EU are for still larger emission reductions of approximately 30%, 17% and 13%, respectively, relative to 2005. Korea's mid-term target is thus positioned between the advanced countries and developing countries. Mexico also pledged to reduce emissions by up to 30% relative to its BAU baseline by 2020, on the condition of adequate financial and technology transfer mechanisms from developed countries. In contrast, Korea's target is not conditional on international agreements and support. Although not legally binding, the target should help guide Korea's climate change policy framework. After examining the level of energy use and greenhouse gas (GHG) emissions, this section looks at Korea's current policy framework and then proposes new measures to achieve the mid-term target.

Box 1. The National Strategy for Green Growth (announced in July 2009)

Three objectives:

1. Promote a synergistic relationship between economic growth and environmental protection.
2. Improve people's quality of life and promote a green revolution in their lifestyles.
3. Contribute to international efforts to fight climate change and other environmental threats.

Three strategies:

1. Mitigating climate change and promoting energy independence.
2. Creating new engines for economic growth.
3. Improving the quality of life and enhancing Korea's international standing.

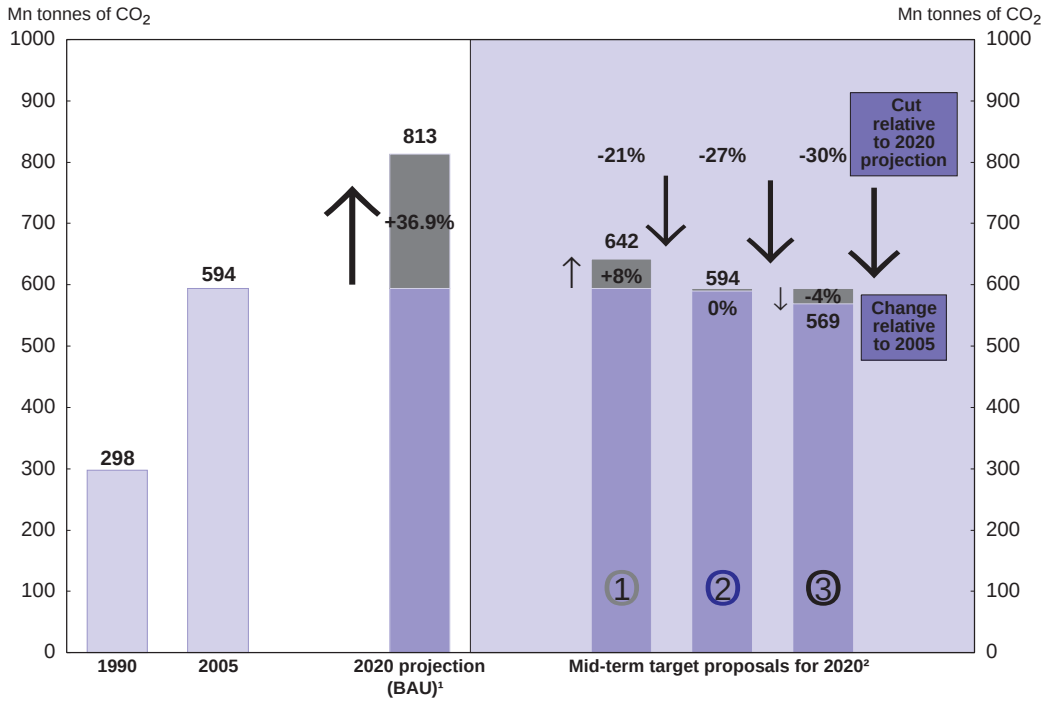
Ten policy agendas to achieve the three strategies:

1. *Effective mitigation of greenhouse gas emissions*: the government will pursue mitigation strategies for buildings, transport and industry, require reporting on emissions and promote forestation.
2. *Reduction in the use of fossil fuels and the enhancement of energy independence*: Korea will reduce energy intensity to the OECD average, increase the use of renewable energy and expand nuclear power capacity.
3. *Strengthening the capacity to adapt to climate change*: Korea will launch the "Four Major Rivers Restoration Project" and increase the share of "environmentally friendly" agricultural products to 18% by 2020.
4. *Development of green technologies*: The government will pursue the development of important green technologies, boosting its world market share in the relevant sectors to 8% within five years.
5. *The "greening" of existing industries and promotion of green industries*: Exports of green goods in the major industries will rise from 10% in 2009 to 22% in 2020 and the government will help small and medium-sized enterprises (SMEs) green their business.
6. *Advancement of the industrial structure to increase the role of services*: the government will develop health care, education, finance, contents industry, software and tourism as the core of high value-added services.
7. *Engineering a structural basis for the green economy*: The government will gradually introduce an emissions trading system, make the tax system greener and extend public credit guarantees to green industry.
8. *Greening land and water and building the green transport infrastructure*: The share of passenger travel by rail will rise from 18% in 2009 to 26% in 2020, and metropolitan mass transit from 50% to 65% over the same period.
9. *Bringing the green revolution into our daily lives*: Carbon footprint labeling will be enacted, the government will increase mandatory procurement of green goods and education on green growth will be expanded.
10. *Becoming a role-model for the international community as a green growth leader:* Korea will actively engage in international climate-change negotiations and increase the share of green ODA from 11% to 30% in 2020.

Overview of energy use and greenhouse gas emission trends in Korea

Korea's energy intensity was a quarter above the OECD average in 2008 and the fourth highest in the OECD area (Figure 2).[6] During the period of rapid economic growth between 1971 and 1997, energy use increased at an 8.8% annual rate, led by the commercial and transport sectors (Table 1). Energy intensity, which was 42% below the OECD average in 1971, peaked during the 1997 crisis. The crisis proved to be a turning point for energy consumption growth, which decelerated to a 3.3% pace during the following decade, leading to a marked fall in energy intensity. Moreover, the main drivers of energy consumption shifted to the residential sector, reflecting higher living standards, and the industrial sector, as exports recorded double-digit growth rates. By 2007, the industrial sector accounted for about half of energy use in Korea, followed by the transport, residential and commercial sectors.

Figure 1. The mid-term target scenario for reducing greenhouse gas emissions in Korea



1. Business-as-usual scenario based on assumptions about population, oil prices and economic growth.
2. The three options were introduced in August 2009 and option three was chosen in November.

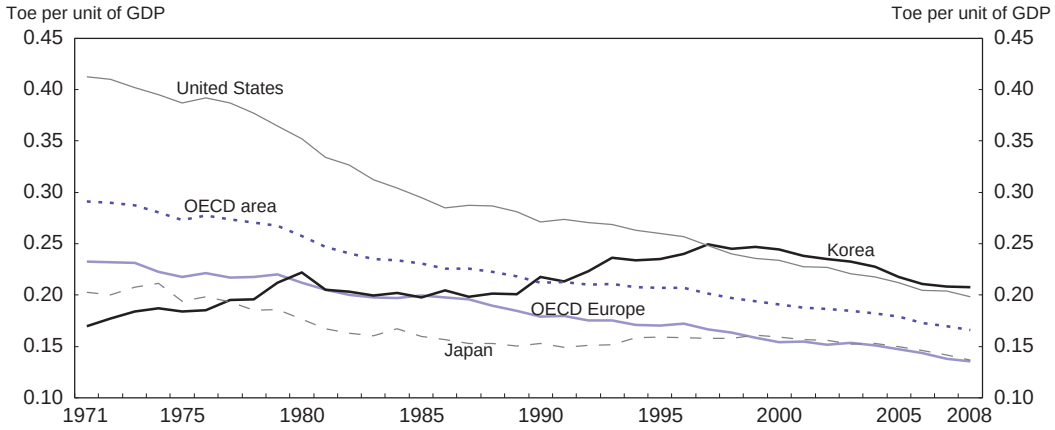
Source: Presidential Committee on Green Growth (2009a).

Korea's GHG emissions accounted for 1.3% of the world total in 2005, making it the 15th-largest emitter in the world and ninth in the OECD area (Figure 3). While Korea's emissions almost doubled between 1990 and 2005, 83% of the increase occurred by 2000. On a per capita basis, Korea's emissions rose by 71.6% over the period 1990 to 2005, far outstripping the OECD average of 2.1% (Table 2, Panel A). The growth in GHG emissions per capita can be explained by changes in per capita income, energy intensity and GHG emissions per unit of energy. The large increase in GHG emissions per capita was primarily a result of rapid economic growth, which doubled per capita income (second column). Moreover, the 2.3% decline in energy intensity (third column) was much less than the OECD average of

6. Energy intensity – total primary energy supply (TPES) divided by GDP – is affected by many non-energy factors such as climate, geography, travel distance, home size and manufacturing structure.

15.3%. These factors were partially offset by a relatively large fall of 12.7% in GHG emissions per unit of energy (fourth column), reflecting greater use of natural gas and nuclear power.[7]

Figure 2. Korea has become one of the most energy-intensive economies in the OECD area
Tonnes of energy per unit of GDP in thousand 2000 US$ using PPP exchange rates



Source: IEA/OECD (2009a), *Energy Balances of OECD Countries 2009*, IEA/OECD, Paris.

Despite the rapid increase, the level of per capita GHG emissions in Korea in 2005 was more than one-fifth below the OECD average (Panel B, first column). This is explained by Korea's relatively low level of GDP per capita (second column) and GHG emissions per unit of energy (fourth column), which more than offset the impact of above-average energy intensity (third column). These figures point to the conclusion that cutting energy intensity, notably by reducing the weight of energy-intensive industries in the economy, is key to slowing the growth of GHG emissions in Korea and keeping the level below the OECD average. The greening of existing industries – where there is significant scope to do so – may also help.

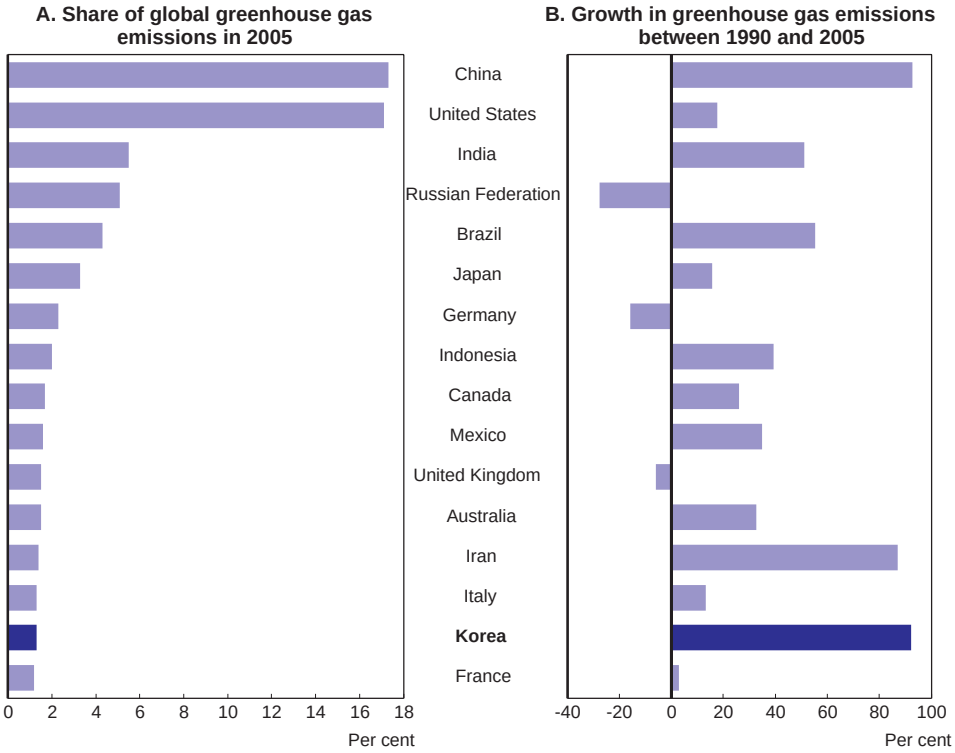
Table 1. Trends in final energy consumption in Korea

	Average annual growth rate (per cent)			Composition (per cent)			Percentage-point change 1997-2007
	1971-97	1998-2007	1971-2007	1971	1997	2007	
Industry	8.9	4.0	7.3	43.9	45.0	51.7	6.7
Transport	10.6	2.2	7.7	15.6	23.7	20.6	-3.1
Residential	3.2	6.9	3.8	35.3	9.0	12.6	3.5
Commercial	15.1	0.9	10.2	4.1	17.6	12.5	-5.1
Other	14.8	-1.9	9.3	1.2	4.7	2.7	-2.0
Total	8.8	3.3	6.8	100.0	100.0	100.0	0.0

Source: IEA/OECD (2009a),Energy Balances of OECD Countries 2009, IEA/OECD, Paris.

7. The shares of natural gas and nuclear energy in TPES increased by 10 percentage points (3% to 13%) and 3 percentage points (15% to 18%), respectively, between 1990 and 2005. CO_2 emissions from natural gas are less than a quarter of that from oil.

Figure 3. International comparison of greenhouse gas emissions



Source: *OECD Environmental Database*.

Korea's policy measures to address climate change

Korea ratified the Kyoto Protocol to the UN Framework Convention on Climate Change in 2002 as a non-Annex I country, meaning that it had no obligation to set a specific GHG reduction target for 2008 to 2012. Nevertheless, as required by all parties under the Framework Convention, Korea has implemented polices to combat climate change since the establishment of its Committee on Climate Change Response in 1999. The key measures are discussed below.

Voluntary and negotiated agreement systems

The National Committee on Saving Energy launched a voluntary agreement system in 1998 to encourage energy efficiency in the business sector. Firms that participate in the programme sign agreements with the government specifying their voluntary energy conservation and GHG emissions reduction targets, as well as their timelines and strategies, which are monitored by the government. In return, the firms are eligible for low interest-rate loans on energy-saving facilities, tax benefits and technical support. By 2008, a cumulative total of 19 million tonnes of energy (toe) had been saved, equivalent to a 58 million tonne reduction in CO_2 emissions (around 10% of annual emissions). Cost savings during the decade amounted to 0.6% of GDP for the participating firms, which increased from 46 in 1998 to 1 323 in 2008. Although voluntary approaches are not cost-effective in addressing environmental externalities, they can reveal information about abatement costs and environmental damage at an early stage (de Serres *et al*., 2010).

Table 2. Decomposition of greenhouse gas emission trends[1]

A. Percentage change between 1990 and 2005

	GHG emissions/population[2]	GDP/population[3]	Energy/GDP[4]	GHG emissions/energy[5]
Canada	8.2	29.7	-15.6	-1.2
France	-4.7	22.1	-9.2	-14.0
Germany	-19.0	21.9	-19.8	-17.2
Italy	9.6	17.3	3.0	-9.3
Japan	11.8	16.7	-4.0	-0.2
Korea	**71.6**	**101.1**	**-2.3**	**-12.7**
United Kingdom	-10.6	36.5	-22.1	-15.9
United States	-0.9	30.8	-21.4	-3.5
OECD average	**2.1**	**28.9**	**-15.3**	**-6.5**

B. Level in 2005

	GHG emissions/population[2]	GDP/population[3]	Energy/GDP[4]	GHG emissions/energy[5]
Canada	23.1	30.6	0.206	3.7
France	8.6	26.5	0.105	3.1
Germany	12.0	26.6	0.114	4.0
Italy	9.7	25.7	0.096	3.9
Japan	11.2	27.1	0.102	4.0
Korea	**11.6**	**20.1**	**0.149**	**3.1**
United Kingdom	11.1	28.2	0.095	4.1
United States	25.0	36.9	0.145	4.7
OECD average	**14.4**	**25.8**	**0.127**	**4.4**

1. GHG emissions/population = (GDP/population) * (Energy/GDP)* (GHG emissions/energy).
2. In tCO_2 eq per head.
3. In thousand 2000 US$ using PPP exchange rates.
4. For total final energy consumption in ktoe/ billion 2000 US$ using PPP exchange rates.
5. For total final energy consumption in Mt CO_2eq / ktoe.

Source: IEA and OECD calculations.

The government launched a pilot project of mandatory negotiated agreements on energy use in 2010. It includes 38 firms, covering 41% of total energy consumption in the industrial sector. The negotiations resulted in agreements to reduce energy use by 3.7% (relative to the average of 2007-09) between 2010 and 2012, which is greater than the 3% cut that they originally proposed. This system will be replaced by the GHG and Energy Target Management System. Under this approach, companies in power generation, manufacturing, construction, waste management and transport will negotiate targets with the government, subject to penalties in case of failure to meet the targets.

Energy-efficiency programmes

Korea has introduced three energy-efficiency programmes for electronics and appliances:

- *Mandatory energy-efficiency standards and labelling* (1992): 23 items are currently subject to energy-efficiency standards, including refrigerators, air conditioners, washing machines and dishwashers, which require them to achieve at least a minimum level of efficiency in order to be sold. Energy-efficiency ratings are attached to products to encourage consumers to choose energy-efficient products and firms to manufacture or import them.

- *The high-efficiency appliance certification* (1996): the government awards labels to products with energy-efficiency levels that are higher than those required by law. A total of 46 items are subject to certification, including converters, LED lighting systems and oil-fired hot-water heaters.

- *Standby electricity reduction programme* (1999): manufacturers are encouraged to make products that automatically switch to power-saving mode when not in use in order to minimise standby electricity consumption. The government grants labels for 20 home electronic and office equipment products, such as televisions, microwaves, computers and printers, which meet the official standard. Warning labels are applied to products that fail to meet the standard.

In order to save fuel and reduce GHG emissions by cars, the government launched the Average Fuel Economy (AFE) regulation in January 2006, patterned on the US Corporate Average Fuel Economy (CAFE) system. Under Korea's regulation, the average fuel economy of all cars sold by a manufacturer over one year must meet the standards, which depend on engine capacity. This system boosted average fuel economy by 6.6% (10.8 to 11.5 km/litre) between 2006 and 2008 and reduced CO_2 emissions by 7.3%.

Clean Development Mechanism and the carbon market

The Clean Development Mechanism (CDM) is one of three programmes introduced by the Kyoto Protocol, which together with emissions trading and Joint Implementation (JI),[8] constitute the official international carbon market.[9] The CDM, which was launched in 2001, allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO_2. CERs can be traded and used by Annex I countries to meet a part of their emission reduction targets under the Kyoto Protocol.[10] Korea, as a non-Annex I country, has been actively involved in the CDM since unilateral projects – those funded by developing countries' own money and not by Annex-1 countries – were allowed in 2005. Korean investment companies own the CERs and can sell them to any Annex-1 country in the market. Korea has 35 projects registered, with renewable energy projects accounting for a third of them.[11] Another 47 projects are in the process of registration. As of February 2010, the UNFCCC expected Korea's registered projects to reduce CO_2 equivalent by an average of 15 million tonnes per year, accounting for 4.4% of the total, ranking Korea fourth behind China (59%), India (12%) and Brazil (6%).

Since 2005, the government has been operating a voluntary carbon market called Korea Certified Emissions Reductions (KCERs), which is open to firms that that have reduced CO_2 emissions by more than 500 tonnes a year through improved energy efficiency and production processes and investment in renewable energy development. Companies receive KCERs for their voluntary GHG reduction projects, which can be traded in the market or purchased for around 5 000 won (about $4.50) per tonne. In practice, there are few buyers given the lack of a domestic reduction obligation, so the government buys most KCERs to promote and compensate measures to reduce GHG emissions. As of the end of 2009,

8. Like the CDM, JI is a project-based mechanism that feeds the carbon market by enabling industrialised countries to carry out joint implementation projects with other developed countries.

9. The global carbon market doubled from $63 billion in 2007 to $126 billion in 2008. The allowance market occupied three-quarters while the project market, including CDM, accounted for the remaining quarter.

10. The projects are registered with the UNFCCC and pass through a rigorous process designed to ensure real and measurable emission reductions that are additional to what would have occurred without the project.

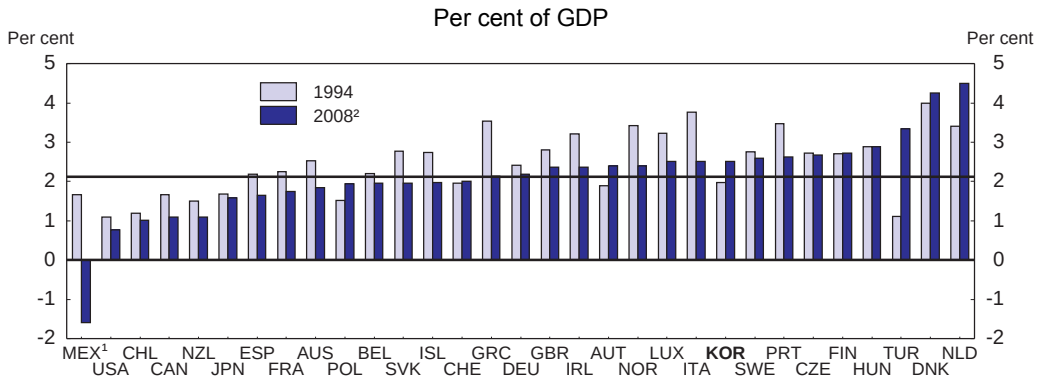
11. As of February 2010, a total of 2 209 projects has been registered, with anticipated annual CERs amounting to 342 million tonnes of CO_2 equivalent.

287 projects had generated 5.6 million KCERs, out of which 4.7 million had been purchased by the government for 23 billion won ($20 million). The government also launched a carbon fund of 105 billion won with the participation of private money in 2007 to invest in CDM projects and purchase CERs or allowances.

Environmental taxes

Revenue from environmental taxes in Korea increased from 2% of GDP in 1994 to 2.5% in 2008, thus surpassing the OECD average, which actually decreased slightly over the same period (Figure 4). Given Korea's low overall tax burden, environmental taxes accounted for 9.5% of total tax revenue, well above the OECD average of 5.4%. The rising share in Korea reflects tax reforms to encourage energy conservation and protect the environment. Between 2001 and 2007, the government raised the tax on diesel by 2.4 times in real terms and the tax on LPG butane by 6.8 times. Heavy oil for industrial uses, which had been tax-exempt in order to support industry despite its highly polluting effect on the environment, became subject to taxation in 2001. By 2009, the tax had been raised five-fold in real terms, but still amounted to only about 3% of the price.

Figure 4. Revenues from environmental taxes



1. In Mexico, consumer prices on motor vehicle fuels are held more or less constant, in spite of large variations in world market prices. In years when world market prices are high, the excise tax on fuels turns into a subsidy – equalling 1.8% of GDP in 2008.
2. Arithmetic average. The weighted average was 1.6%.

Source: *OECD/EEA Database on instruments used for environmental policy*.

The share of taxes in energy prices in Korea is relatively high compared to North America and Japan, although less than in Europe (Table 3). Overall prices for diesel, gasoline and light fuel for households and industry in Korea are significantly higher than the OECD average, regardless of whether purchasing power parity or market exchange rates are used. For example, the price of gasoline is 2.8 times higher than the OECD average using the former and 72% higher using the latter. The higher prices have helped to slow the growth of Korea's energy consumption and GHG emissions during the past decade. However, 80% of the revenue from the transport-energy-environment tax, which covers gasoline and diesel, is earmarked for transport infrastructure, primarily roads, thus undermining the effectiveness of energy taxation. Investment in railroads, a more energy-efficient mode of transport, is limited to one-fifth of total earmarked revenue. Energy taxation should be improved by removing earmarking to allow a more efficient allocation of the budget, particularly in the context of the need for fiscal consolidation.

Table 3. Share of taxes in energy prices
Per cent of total price

	Asia		North America		Europe			OECD average
	Korea	Japan	USA	Mexico	France	Germany	UK	
A. Share of taxes (in per cent) in 2009[1]								
Diesel	46.7	36.3	21.0	15.1	59.1	59.0	65.4	--
Unleaded gasoline	56.2	51.2	20.6	16.3	65.1	65.9	64.5	--
Light fuel oil for households	19.3	7.8	4.7	n.a.	26.2	27.7	28.5	--
Light fuel oil for industry	19.3	9.1	4.9	n.a.	13.0	14.0	25.2	--
B. Price per litre using PPP exchange rates (US$) in 2009								
Diesel	1.79	0.90	0.65	0.94	1.09	n.a.	1.57	1.06
Unleaded gasoline[2]	2.05	1.05	0.62	0.93	1.36	n.a.	1.60	0.73
Light fuel oil for households[3]	1 250	580	665	n.a.	627	n.a.	665	699
Light fuel oil for industry[3]	1 247	411	435	580	477	n.a.	n.a.	492
C. Price per litre using market exchange rates (US$) in 2009[1]								
Diesel	1.09	1.11	0.65	0.57	1.39	1.56	1.62	1.07
Unleaded gasoline[2]	1.24	1.28	0.62	0.57	1.73	1.88	1.65	0.72
Light fuel oil for households[3]	758	713	665	n.a.	798	745	686	769
Light fuel oil for industry[3]	757	505	436	353	607	626	687	519

1. The third quarter of 2009 for Germany.
2. Premium unleaded (95 RON) gasoline prices are used for France and the United Kingdom.
3. Per 1 000 litres.

Source: IEA/OECD (2010).

Creating a new policy framework: getting the price right through market-based instruments

Although these policies have helped to slow the increase in GHG emissions since 2000, emissions almost doubled between 1990 and 2005, as noted above. Achieving the emission reduction that has been included in the mid-term plan at a low economic cost will therefore require a policy strategy based on a more effective mix of instruments. The key is to rely on pricing instruments to a much larger extent so as to put a global price on greenhouse gases. Pricing GHG has several advantages. In the short run, it minimises the cost of reducing emissions by equalising the marginal abatement cost across all individual emitters for any reduction objective. Over the long run, market instruments provide incentives for firms to develop new technologies that will help lower future abatement costs. From the perspective of investors, a clear and credible price for carbon is needed as early as possible to make appropriate investment decisions for the future. New technologies that are still at an early stage of development, such as carbon capture and storage, may never be developed and deployed on a large scale without such a price signal. A market approach also reduces the costly burden of gathering the information necessary for regulation. In particular, under an emissions trading system (ETS), the authorities only need to specify the appropriate level of emissions and then rely on price signals to achieve it (Goodstein, 2007). In sum, a market-based approach that sets a clear price is clearly superior to voluntary measures, negotiated agreements or a sector-specific approach that calculates energy efficiency by sector and adds up the reductions that can be achieved.

Emissions trading systems (ETS) and carbon taxes: the pros and cons

Environmental taxes, such as the carbon tax already in place in a few countries and an ETS based on emission permits, are the main instruments for putting a price on GHG emissions. Both meet the efficiency criteria, as they encourage emitters to adopt abatement solutions that cost less than the level of the tax or permit price, thereby ensuring that the least-expensive abatement options are fully exhausted. Both also reduce the current demand for energy and make the price of renewable energy sources more competitive.

Furthermore, the two instruments give strong incentives for monitoring and enforcement by the authorities and, assuming that the permits are auctioned, generate revenues that can be used to reduce labour taxation, thereby increasing efficiency.

Although a carbon tax cannot set a fixed emission cap for the whole country, an advantage of an ETS (Box 2), it also provides a clear price signal that promotes private-sector investment in energy-saving technology. Moreover, a carbon tax has some advantages, as it is easy to adopt from a technical standpoint, has lower transaction costs and guarantees the maximum and minimum cost, although the optimal carbon tax rate can change over time.

In comparison, an ETS is generally more costly to implement, owing mainly to its more complex design. But once start-up costs are overcome, it has a number of clear advantages. *First*, an ETS can secure a more targeted level of emission reduction than a carbon tax. Indeed, there is less certainty as regards the amount of emission reductions associated with a certain level of tax, and thus it may require several iterations to achieve the desired level of emission cuts. *Second*, it facilitates linkages with foreign carbon markets, which could lower the cost of reducing emissions for Korea. *Third*, the participation of firms in the market for permits creates a constituency for maintaining the system.[12] *Fourth*, unlike a carbon tax, a trading scheme does not need to be adjusted for inflation or growth.

Box 2. The main characteristics of a cap-and-trade emissions trading system

A mandatory ETS based on cap and trade allows holders of permits the right to emit a certain amount of GHG. The total amount of permits is set at the overall desired level of future emissions by the covered sources. Emitters can trade permits among themselves in an open market, as those who emit less than their target can sell permits to those who exceed it. The price of traded permits depends, in part, on the total amount of permits. One key question is how to allocate the permits. A grandfathering approach – granting permits for free based on past emissions – is politically attractive and is used in some countries to gain the support of incumbent firms. However, if emitters expect that such an approach will continue, the incentives to reduce emissions would be weakened. Moreover, giving away permits to existing firms would act as an entry barrier, as new firms face higher costs than existing firms, and it may encourage non-viable firms to remain in business solely to receive free emission permits. A better approach is to sell permits through an auction scheme, similar to the plans for allocating frequency spectrum for mobile telephony. Although auctioning permits is more costly for firms, it would provide revenues for the government, thus allowing reductions in other taxes and their associated distortions. If policy makers instead choose a grandfathering approach, they should at least announce that it will be phased out, thereby strengthening incentives to reduce emissions.

Firms face considerable risk and uncertainty about prices in an ETS, which can be volatile. One remedy is to allow firms to save or bank permits that are not used in the trading period in which they are issued. Such an approach increases efficiency by allowing firms to adjust their emissions reduction schedule to their investment programme. A recent study found that banking cuts abatement costs, while increasing the amount of GHG emission reductions even in the short term (Bosetti *et al*., 2008). The borrowing of permits has a similar effect, although there is a need for caution as firms do go bankrupt. Allowing firms to smooth their emission profiles through the business cycle by banking and borrowing permits also helps to limit price volatility (Philibert and Reinaud, 2004).[1] Banking and borrowing, however, require adequate compliance mechanisms and long-term targets to be effective. Another option to manage risk would be to set emission targets based on intensity (*e.g.* emissions per unit of output), rather than on the absolute amount, thereby allowing the automatic adjustment of emission objectives to unexpected shocks to output growth and marginal abatement costs (Ellis and Tirpak, 2006). However, intensity targets would complicate international links with ETS that are based on absolute amounts.

1. In the European ETS, for example, the spot price fell from over € 30 per ton of CO_2 to under € 1 between the spring of 2006 and the spring of 2007 in the absence of banking provisions, which were avoided in the pilot stage as they would have caused serious environmental damage.

12. An ETS that gives away permits for free is less costly for firms than a carbon tax. As noted below, however, such an approach is less efficient than auctioning permits.

A comprehensive cap-and-trade ETS appears to be the best option

On balance, the case for using an ETS as the main instrument to control carbon emissions in Korea is compelling, in spite of the initial start-up costs. However, given that an ETS works best at the level of relatively large emitters, even a fairly comprehensive ETS may exclude certain sectors, notably households and offices. Taxation, on the other hand, is the instrument of choice for small and diffuse sources such as households, farmers and small businesses, thus leaving scope for a carbon tax to co-exist with an ETS. It is important, though, to minimise overlap and complicated interactions between an ETS and a carbon tax that would raise uncertainty about the overall outcome (OECD, 2006). In particular, the two instruments should be set to minimise differences in the explicit and implicit carbon prices across sectors (de Serres *et al*., 2010).

The government will submit legislation in 2010 to establish a framework for an ETS under a cap-and-trade scheme and set the starting date.[13] Given the ability of a well-designed system to reduce GHG emissions in a cost-effective manner, Korea should quickly introduce an ETS with wide coverage, ideally by auctioning the initial permits, in order to achieve its 2020 target.[14] The scheme should include banking and possibly borrowing of permits to limit risk, uncertainty and volatility. In addition, Korea's ETS should be as comprehensive as possible in its coverage. As for a carbon tax, the government is considering such an approach as well. If the ETS is not comprehensive, a carbon tax would be an effective policy to cope with excluded sectors, while limiting overlap and complicated interactions.

A key obstacle to the implementation of an ETS and/or a carbon tax in many countries is concern about their impact on the international competitiveness of domestic industries.[15] An effective climate change policy requires that some firms do not survive, either because demand for their products falls or because more GHG-efficient firms – domestic or foreign – increase their market share. However, OECD analysis has found that the effects of climate policies on competitiveness are likely to be small and limited to only a few energy-intensive industries, particularly if an ETS has broad international coverage (OECD, 2009c). This illustrates the importance of wide coverage in the post-Kyoto framework. Otherwise, the emission cuts in some countries with an ETS and/or carbon tax would be partly offset by increases elsewhere, a phenomenon referred to as carbon leakage. However, recent OECD research found that unless only very few countries take action against climate change, leakage rates will be relatively small (OECD, 2009d).

Removing environmentally harmful energy subsidies

Another priority is to remove subsidies[16] to fossil fuel-based energy production and consumption, which boost GHG emissions. A recent OECD study found that closing the gap between domestic and international fossil fuel prices could cut GHG emissions in the subsidising countries by as much as 30% relative to BAU levels by 2050, and by 10% globally (Burniaux *et al.*, 2009). Moreover, eliminating subsidies would increase efficiency and save fiscal resources that could be used more productively.

13. ETS are already in place or are about to be implemented in the European Union, Australia, Canada, New Zealand, Norway and some states in the north-eastern part of the United States. A growing number of other countries, including Japan, are considering introducing an ETS (Burniaux *et al*., 2008).

14. Korea's introduction of an emission cap-and-trade programme in 2008 covering NOx, SOx and Total Suspended Particles (TSP) in the capital region is giving it experience in operating an ETS.

15. Another concern is a possible adverse impact of a carbon tax on income distribution, reflecting its regressive nature. This can be addressed, at least in principle, via the tax-benefit system (Duval, 2008).

16. The definition of subsidies in OECD analysis of the energy sector includes grants or soft loans to producers or consumers of energy, market price support and differential tax rates on different fuels (OECD, 2005a).

Korea has few explicit subsidies for fossil fuels and they do not protect any important domestic industries. The main subsidy is for the production of coal and its use in the form of charcoal briquettes by low-income households. In 2008, domestic coal production amounted to only 2.8% of Korea's coal imports (Table 4). Nevertheless, this subsidy distorts resource allocation and encourages excessive consumption of coal, which has more harmful emissions than other fossil fuels. Despite the gradual decline in the subsidy, it still amounted to 267 billion won in 2009, equivalent to around 5% of total environment-related spending by the central government. The government should eliminate this subsidy in favour of more environmentally friendly measures to support low-income groups.

Another, more indirect, subsidy is the sale of electricity at prices below costs. Overall, the recovery rate – the unit price as a share of the total unit cost – was 93.8% in 2007, but it varies widely among sectors (Table 5). In particular, the recovery rate in the residential sector was high at 99.2% compared to 90.5% in industry and only 39.2% in agriculture. Without the subsidy, the electricity price for industry would be around the OECD average.[17] The subsidy for industry widens the price gap with services (most of which are included in the general category in Table 5) to 34%, much larger than the 21% gap in unit costs. There are also cross-subsidies in natural gas (Moltke *et al*., 2004). The 2008 National Energy Master Plan through the year 2030 stated that Korea should abolish cross-sector subsidies, thereby allowing prices to match unit costs in each sector.

Table 4. Coal production and briquette price subsidy

	1989	1999	2007	2008	2009
Coal production (million tonnes)	20.8	4.2	2.9	2.8	2.5
Total subsidy (billion won)[1]	46	323	339	297	267

1. The subsidy covers subsidies for briquette manufacturers, industrial accident insurance premiums, and school expenses for children of mine workers.

Source: Ministry of Knowledge Economy.

Table 5. Recovery rate of electricity price by sector in 2007

	Average	General	Residential	Industrial	Educational	Agricultural
Unit price (won/kWh)	77.9	97.7	114.3	64.6	77.2	42.5
Total unit cost[1] (won/kWh)	83.0	90.1	115.3	71.4	87.1	108.2
Recovery rate (%)	93.8	108.4	99.2	90.5	88.7	39.2

1. Unit cost is all production and sales cost, plus the cost of capital.

Source: Government of Korea (2008), *The National Energy Master Plan 2008-2030*, Seoul.

Creating new growth engines for the future

Achieving large reductions in GHG gases requires shifting the economic structure away from the energy-intensive industries that have driven Korea's rapid development thus far. However, fighting climate change need not hinder economic growth, as moving to a more sustainable growth path brings new opportunities to increase output and employment, provided that action is taken early so that GHG emissions can be reduced progressively. While the shift to a low-carbon society will reduce jobs and activities in some sectors, this will be offset by the creation of new jobs and the expansion of other sectors.

17. In 2008, Korea's electricity prices for industry and households were $0.087/kWh and $0.128/kWh (using purchasing power parity exchange rates), while the OECD averages were $0.108/kWh and $0.141/kWh, respectively (IEA/OECD, 2010).

Environmental policies can act as a catalyst for eco-innovation, in particular by creating new markets for low-carbon technologies and equipment. The net impact of environmental policies on employment could be positive insofar as green jobs tend to be concentrated in more labour-intensive sectors, such as renewable energy, recycling, public transport and construction. According to one estimate, boosting investment in renewable energy to $630 billion by 2030 would create at least 20 million additional jobs worldwide, making it a much larger source of employment than today's fossil energy industry, which includes mining, petroleum extraction, refining and fossil power generation (UNEP, 2008).

The Five-Year Plan for Green Growth, 2009-13

To implement the National Strategy for Green Growth, which covers the years up to 2050 (Box 1), the government announced in July 2009 the Five-Year Plan for Green Growth. This initiative revives the practice of five-year plans, which were used between 1962 and the mid-1990s. While the government recognises that the "effectiveness of five-year plans dwindled as the Korean economy more broadly embraced market economy principles", it believes that they are useful for national consensus building and to incorporate green growth spending in the national budget (Presidential Committee on Green Growth, 2009b). The Five-Year Plan absorbed the Green New Deal for 2009-12, which was announced in January 2009 to tackle the financial crisis through job creation and to secure new growth engines by transforming Korea into a green economy.[18]

The Five-Year Plan calls for spending 2% of GDP per year over the period 2009-13, completely financed by the central government budget except for 8.5 trillion won (0.8% of GDP) in spending by two public enterprises.[19] The government estimates that the plan will induce production worth 182-206 trillion won (around 20% of 2009 GDP) and create 1.6 to 1.8 million jobs (a 10% rise in employment) by 2013, suggesting a relatively high fiscal multiplier of around two.

The high level of spending in the Five-Year Plan is due in part to the inclusion of large construction projects among the 600 projects (Table 6). Two of the ten spending categories, which are mainly focused on public construction, account for 61 trillion won – more than half of total expenditures. *First*, "Greening the land, water and building the green transport infrastructure" (category 8) includes ongoing railway projects as part of the government's plan to boost the share of passenger transport by rail from 18% in 2009 to 26% in 2020. This will be achieved by further expanding the high-speed train system, Korea Train eXpress (KTX), which started in 2004 and already accounted for a little more than one-half of long-distance rail passengers in 2008.[20] *Second*, "Strengthening the capacity to adapt to climate change" (category 3) includes water management, such as river restoration and sewage facility projects. The Korean peninsula experiences droughts in the spring and heavy monsoon rains in the summer and climate change is exacerbating this pattern. A large share of this spending (15.4 trillion won) is for the "Four Major Rivers Restoration Project", which notably includes the construction of 16 new weirs (dams that allow water to flow over the top) on the four major rivers, two new dams on their tributaries and heightening the banks of 96 existing agricultural reservoirs. The Project has five aims: *i)* securing abundant water resources; *ii)* implementing comprehensive flood control; *iii)* improving water quality and restoring the ecosystem;

18. The Green New Deal included 36 projects, such as the Four Major Rivers Restoration Project and railroad construction. Spending is divided between water and waste management (13 trillion won), railroad construction (11 trillion won), energy-efficient buildings (10 trillion won), low-carbon vehicles (3 trillion won) and renewable energy (3 trillion won). The government expects this programme to create 0.9 million jobs.

19. Local governments are developing their own five-year plans to implement the national plan.

20. The line connecting Daegu and Busan is to be completed by the end of 2010, while a line connecting Seoul to Mokpo in the southwest is to be completed by 2014. This spending would not be included in the OECD's definition of environmental expenditure.

iv) creating multipurpose spaces for local residents; and *v)* promoting regional development centred on rivers, leading to the creation of 340 thousand jobs (Government of Korea, 2009). In contrast to the large share of infrastructure construction, spending on R&D accounts for 12% of the Five-Year Plan.

Table 6. The Five-Year Plan for Green Growth (2009-13)
Trillion won[1]

	Total	2009	2010	2011	2012	2013
Total	**107.4**	**17.4**	**24.2**	**25.7**	**20.6**	**19.4**
Central government budget	98.9	17.4	20.5	21.9	19.6	19.4
Public enterprises' investment	8.5	-	3.7	3.8	1.0	-
Memorandum item: total green technology R&D investment in all categories	*(13.0)*	*(1.9)*	*(2.2)*	*(2.5)*	*(2.8)*	*(3.5)*
1. Adapting to climate change & enhancing energy independence	**57.5**	**8.5**	**15.5**	**16.0**	**9.8**	**7.7**
1. Effective mitigation of greenhouse gas emissions	5.4	1.0	0.9	1.0	1.1	1.3
2. Reduction of the use of fossil fuels and the enhancement of energy independence	15.4	2.8	3.8	2.9	3.0	2.8
3. Strengthening the capacity to adapt to climate change	36.7	4.7	10.9	12.0	5.6	3.6
(Four Major Rivers Restoration Project)	*(15.4)*	*(0.8)*	*(6.4)*	*(7.1)*	*(1.1)*	*(-)*
2. Securing new growth engines	**23.5**	**3.9**	**4.1**	**4.7**	**5.3**	**5.6**
4. Development of green technologies	7.6	1.5	1.4	1.5	1.5	1.6
5. The "greening" of existing industries and promotion of green industries	4.5	0.7	0.9	0.9	1.0	1.0
6. Advancement of industrial structure to increase services	9.7	1.4	1.5	2.0	2.4	2.5
7. Engineering a structural basis for the green economy	1.8	0.3	0.2	0.3	0.4	0.5
3. Improving living standards & enhancing national status	**26.4**	**5.0**	**4.6**	**5.1**	**5.6**	**6.1**
8. Greening the land and water and building the green transport infrastructure	23.9	4.6	4.2	4.6	5.0	5.5
9. Bringing the green revolution to daily lives	1.8	0.3	0.3	0.3	0.4	0.4
10. Becoming a role-model for the international community as a green growth leader	0.7	0.1	0.1	0.1	0.1	0.1

1. Actual budgets for 2009-10 and projections for 2011-13.
Source: Ministry of Strategy and Finance and Presidential Committee on Green Growth.

The October 2009 mid-term fiscal plan (2010 *OECD Economic Survey of Korea*) incorporated the expenditures contained in the Five-Year Plan for Green Growth announced in July. Nevertheless, the total amount of spending for the years 2011-12 did not increase compared to the 2008 mid-term fiscal plan. This could be explained by two factors. *First*, outlays in some non-green growth categories may have been cut. *Second*, some previously planned expenditures may have been re-categorised as green growth. To the extent that it is the latter, the role of the green growth plan in shifting spending priorities appears less important. Nevertheless, the plan is likely to affect public expenditure decisions going forward.

Given the large size of the Five-Year Plan, it is crucial that spending be implemented in a transparent and effective manner, in line with the OECD's recommendations on good practices for managing public environmental expenditures (OECD, 2008d). Green growth infrastructure projects should be subject to the same *ex ante* cost-benefit analysis as other public investment. In Korea, the Public and Private Investment Management Centre (PIMAC) was established as an independent organisation in 1999 to conduct *ex ante* evaluations of large-scale public investment projects. During its first five years, it rejected about 80% of the proposed projects, resulting in significant cost savings (OECD, 2005b). Moreover, the performance of each green growth project should be carefully monitored and regularly reviewed as part of the budget

process to ensure that it achieves the desired policy goals. In an era of fiscal consolidation, choosing cost-effective policy measures is especially important. The Five-Year Plan should therefore rely on policies with well-designed incentive schemes that activate market forces. For example, R&D tax credits are likely to lead to a more efficient allocation of resources than direct subsidies for specific projects (de Serres *et al*., 2010).

R&D in green technologies

Technological change is the key to minimising the cost of addressing the climate change problem (OECD, 2010e). To encourage innovation in green technologies, the first priority is to put a credible price on carbon, preferably through emissions trading, as noted above. Market forces would then provide a powerful incentive for the development of new low-carbon technologies and would guide resources to the best technologies, making them more cost-competitive.[21] However, price signals alone cannot ensure adequate R&D and innovation given market failures, such as those related to learning-by-doing and market size, as well as the inability of innovators to fully capture the gains from their innovation. While such problems are common to all types of R&D, it is magnified in the area of climate change by policy uncertainty and weak protection of intellectual property rights (IPR).[22] Given these market failures, public investment in R&D is needed to "kick-start" the innovation process. The government should focus on basic R&D to share the risk of developing new technologies with the private sector, particularly in large-scale projects.[23] To promote the use of new technologies, the government can provide other measures, such as commercialisation support and information services (OECD, 2010a).

Government spending on energy research, development and demonstration (RD&D)[24] fell as a share of GDP in many OECD countries between the early 1980s and the 1990s (Figure 5), reflecting the difficulties in the nuclear industry and the drop in oil prices from 1985 to 2002 (IEA/OECD, 2008a). To combat climate change and promote green growth, more public investment in RD&D worldwide appears to be needed. Korea's RD&D budget in energy-related areas rose from 0.02% of GDP in 2002 to 0.07% in 2008, the second highest in the OECD area. In terms of the absolute amount, Korea ranks fourth after the United States, Japan and France. However, the share of green technology patents originating from R&D in the environment or energy is rather small, suggesting that innovation is very multi-disciplinary (OECD, 2010b). Therefore, the authorities should be careful in emphasising R&D in a particular area.

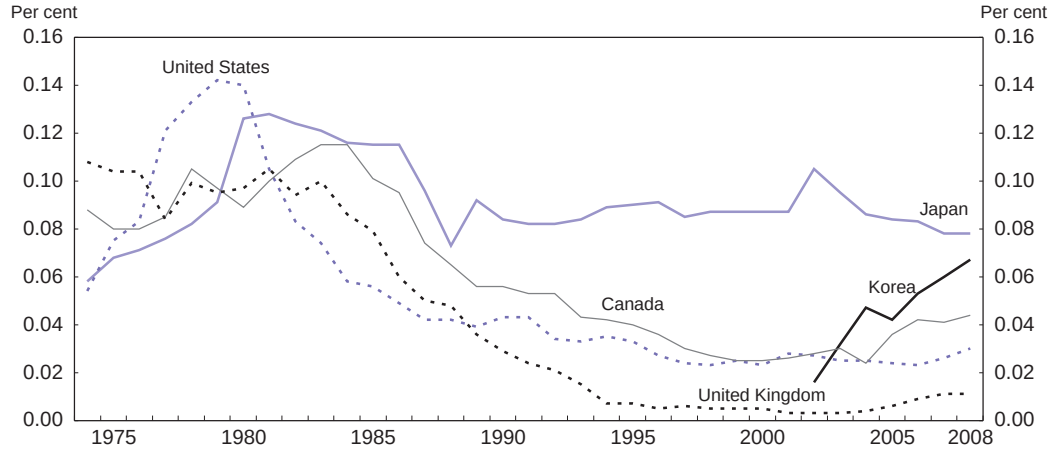
21. This is illustrated by the introduction of an emission cap-and-trade programme in 2008 covering NOx, SOx and TSP in the capital region in 2008, which led to a large increase in the number of patents on technology to reduce emissions (Kim and Kang, 2009).

22. Weak protection of IPR is likely to be particularly problematic in R&D related to climate change for two reasons. *First*, developing countries may consider access to the most efficient abatement technologies to be an important condition for their participation in emission abatement efforts. This weakens the credibility of IPR and thus reduces firms' incentive to innovate. *Second*, the value of R&D in climate change depends on the credibility of governments' abatement policies. If firms are uncertain whether governments will follow through on their intended policies, their incentives to invest in such R&D are weakened (OECD, 2008b).

23. Breakthrough technologies, such as fuel cells, advanced biofuels or advanced nuclear technologies, are estimated to require large investment in R&D at the initial stage (de Serres *et al*., 2010).

24. In the area of energy R&D, "demonstration" – projects to show that new technology is feasible, for example in renewable energy sources – is an important compliment to R&D. Korean official statistics do not include outlays for demonstration. Instead, their target is for R&D alone.

Figure 5. Government energy RD&D budget as a share of GDP



Source: IEA/OECD Energy Database.

In the Five-Year Plan, the government plans to expand its R&D investment in green technologies from 2 trillion won in 2009 to 3.5 trillion won by 2013, making a cumulative amount of 13 trillion won. This would boost green R&D from 16% of the government's total R&D spending in 2009 to 20% by 2012.[25] R&D will focus on 27 core technologies (Table 7) that were announced in January 2009 as new growth engines for Korea. These strategies were chosen following consultation with various experts and later incorporated into the Green Growth Strategy. The decision whether to include a technology in the list was based on its potential contribution to economic growth and environmental sustainability and its strategic importance. In order to co-ordinate R&D policy, the National Science and Technology Council will be closely linked to the Green Growth Committee. The "Key Green Technology Development and Commercialisation Strategies" was announced in May 2009 as a roadmap to develop these technologies. In addition to public R&D, the Five-Year Plan includes fiscal support for green R&D by SMEs.

Public R&D and public funding of private R&D have a role to play, although they may not meet the cost-effectiveness criterion, as they have no mechanism to ensure that the target is achieved at the least cost (de Serres *et al*., 2010). The success of public R&D depends on two factors. *First*, it is necessary to establish a clear and credible price for carbon beforehand to make public R&D effective in redirecting technological change towards green technologies (Bosetti *et al*., 2009). This would suggest accelerating the introduction of an ETS and a carbon tax. *Second*, it is important to upgrade the general innovative capacity, which is a key determinant of innovation in environmental technology (Hascic and Johnstone, 2010).

Despite its high level of R&D intensity and the improvement in its innovation framework, Korea still has weaknesses in fundamental research and system linkages (OECD, 2009b). To promote Korea's convergence to high-income countries, the government has focused on immediate and tangible returns from its R&D investments, focusing on "experimental development". Technological progress and the growing maturity of the Korean economy require expanding basic research from its current 15% share of total R&D and developing more sophisticated infrastructure, particularly for green technologies. The government should promote these goals by further increasing the share of basic research in public R&D spending to support private-sector innovation. For large-scale R&D projects, it is important to share the risk with private firms by investing public money in related basic research. In particular, Korea needs to bolster its capacity for basic research in universities, which employ around 70% of all doctorates but account for just 10% of total R&D spending. Moreover, a lack of co-operation between government research institutes (GRIs) and universities hinders development of closer and mutually beneficial linkages.

25. In addition, the government will double the share of its basic R&D in green technology to 35% by 2012.

The government needs to encourage closer co-operation between GRIs, universities and the private sector by facilitating joint projects, enhancing the mobility of researchers, tackling the mismatch between human resources and research spending in universities and expanding access to GRIs' research infrastructure.

Table 7. Core green technologies

Sector	27 core green technologies	Timing[1]
Climate change	1. Monitoring and modelling for climate change	Long term*
	2. Climate change assessment and adaptation	Long term*
Energy source technology	3. Silicon-based solar cells	Short term
	4. Non-silicon based solar cells	Long term*
	5. Bio-energy	Long term*
	6. Light water reactors	Short term
	7. Next-generation fast reactors	Long term
	8. Nuclear fusion energy	Long term
	9. Hydrogen energy R&D	Long term
	10. High-efficiency fuel cells	Long term
Technologies to improve efficiency	11. Plant growth-promoting technology	Long term
	12. Integrated gasification combined cycle	Long term
	13. Green cars	Medium term
	14. Intelligent infrastructure for transport and logistics	Long term*
	15. Green city and urban renaissance	Long term
	16. Green buildings	Long term
	17. Green process technology	Medium term
	18. High-efficiency light-emitting diodes/green IT	Short term
	19. IT-combined electric machines	Long term
	20. Secondary batteries	Medium term
End-of-pipe technology	21. CO_2 capture, storage and processing	Long term
	22. Non-CO_2 processing	Medium term
	23. Assessment of water quality and management	Medium term
	24. Alternative water resources	Medium term
	25. Waste recycling	Medium term
	26. R&D in monitoring and processing for hazardous substances	Long term
R&D in virtual reality	27. Virtual reality	Medium term

1. Projects are divided between intensive investment in the short, medium and long run. Long-run projects marked with an asterisk are to have gradual, rather than intensive, increases in investment.

Source: Presidential Committee on Green Growth (2009a).

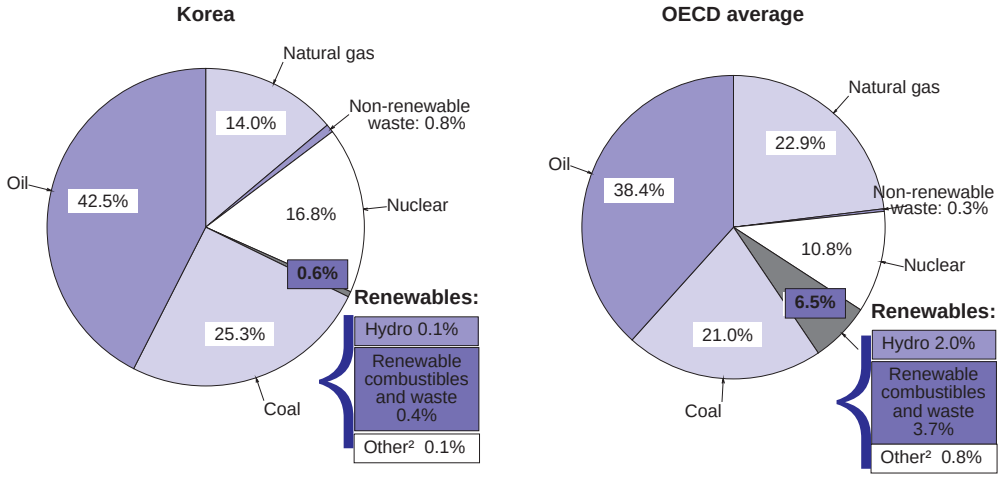
Developing renewable energy sources

The development and deployment of renewables is one of the key priorities to achieve a low-carbon society. Although worldwide investment in renewable energy reached $155 billion in 2008, a seven-fold increase from 2002, it has been estimated that this investment must more than triple for global carbon emissions to peak by 2020 (UNEP, 2009a). The share of renewable energy in the total primary energy supply (TPES) in Korea was only 0.6% in 2007, far less than the OECD average of 6.5% (Figure 6) and the lowest in the OECD area.[26] Moreover, its share declined from 1.1% in 1990, while the share in the OECD area increased from 5.8% over the same period. There appears to be considerable scope to develop renewable energy sources in Korea; the additional realisable potential contribution of renewables in 2020

26. The Korean government's data on the share of renewable energy in TPES were higher at 2.4% in 2007 because they include industrial waste and non-renewable municipal waste as renewable energy sources. Under IEA methodology, such waste is excluded from the definition of renewable energy sources on the grounds that they are not biodegradable (IEA/OECD, 2009b).

has been estimated to amount to 43.2 TWh, equivalent to 12% of total electricity generated in 2005 (IEA/OECD, 2008b). This would be a large increase from less than 1% in 2007. In particular, Korea has a relatively large potential in solar photovoltaics (10.4 TWh) and offshore wind (9.0 TWh).

Figure 6. Energy sources in the OECD area in 2007[1]



1. As a share of total primary energy supply.
2. Geothermal, wind, solar and tide.

Source: IEA/OECD (2009a) and IEA/OECD (2009b).

The National Strategy for Green Growth established a target of increasing the share of renewable sources in TPES from 2.4% (according to Korea's definition of renewables) to 6% in 2020,[27] 11% in 2030 and 30% by 2050. The government estimates that this objective requires 111.4 trillion won of investment by 2030, including R&D of 11.5 trillion won. The public sector will provide 32 trillion won of this amount. Moreover, a Renewable Portfolio Standard (RPS)[28] will be introduced in 2012 to accelerate the diffusion of renewables. In addition, the government plans to increase the use of nuclear power, which is the least expensive means to generate electricity and produces almost zero GHG. Nuclear energy's share of electricity generation capacity is targeted to increase from 26% in 2007 to 41% in 2030.

In sum, Korea is still at an early stage in the development and utilisation of renewables. Achieving its 6% target by 2020 requires an effective and efficient policy framework based on the following principles (IEA/OECD, 2008b):

- Remove non-economic barriers, such as administrative hurdles, obstacles to grid access, poor electricity market design, lack of information and training, and social acceptance issues.
- Establish a predictable and transparent support framework to attract investment.
- Introduce transitional incentives that decrease over time to foster and monitor technological innovation and move technologies quickly towards market competitiveness.
- Develop and implement appropriate incentives that guarantee a specific level of support to different technologies based on their degree of technological maturity, in order to exploit the significant potential of the many options for renewable energy technologies over time.

27. This objective is relatively modest compared to the EU and China, which both set targets of 20% for 2020.

28. A RPS is a regulation that requires the increased production of energy from renewable sources. It generally places an obligation on electricity companies to produce a specified fraction of their electricity from renewable sources.

- Consider the impact of large-scale penetration of renewable energy technologies on the energy system in terms of cost efficiency and system reliability.

As noted above, the government should develop a flexible framework that increasingly applies market principles as a renewable energy technology matures and its deployment advances. Moreover, as technology evolution is hard to predict, picking winners by subsidising specific projects is risky as it may lock in technologies that will not be economically efficient. For example, the high cost of biofuels suggests some caution in promoting this energy source. Indeed, the cost of support to biofuels is estimated at between $960 and $1 700 per tonne of CO_2 saved (OECD, 2008a), compared to the price of $15 to $30 price per tonne in the European ETS.

Promoting green industries

The Five-Year Plan includes 23.5 trillion won (2.2% of 2009 GDP) to secure new growth engines, in part by greening existing industries and promoting new industries. For example, among the 17 new growth engines announced in January 2009, there were six in green technology industry; new renewable energy, low carbon energy, water technology, LED application, green transport system and high-tech green city (2010 *OECD Economic Survey of Korea*). The government has launched a number of initiatives to provide financial resources to green industry. *First*, it introduced tax incentives in 2010 for financial instruments that invest in green technology and industry. Dividends and interest from bonds, deposits and investment funds that invest at least 60% of their capital in firms and projects with green certificates (see below) are tax-exempt up to certain ceilings. *Second*, as part of the Five-Year Plan, government lending for green firms and projects will be expanded. *Third*, public credit guarantees for green firms will be increased from 2.8 trillion won in 2009 to 7 trillion won in 2013, and provided under more favourable conditions. *Fourth*, the government plans to launch a green private equity fund (UNEP, 2009b). These green finance measures will fund firms, projects and technologies that are granted "green certificates", under a new programme that was introduced in April 2010. The certificates will be given by public institutes based on technologic impact, feasibility, the degree of greening and environmental impact. Green firms are defined as those for which certified green technology accounts for more than 30% of sales.

It is important to avoid the risk that granting green certificates to certain firms and projects might result in a bubble. Such a risk is demonstrated by the experience with the measures to jump-start the venture business sector in the late 1990s. Firms that met one of three criteria were designated as a venture business and received a number of financial benefits.[29] The end result was a bubble in KOSDAQ, the second-tier stock exchange. Moreover, the qualifying conditions were sufficiently vague that it reduced the credibility of the venture business sector. After the introduction of tighter criteria in 2002, the KOSDAQ price index fell 90% from its 1999 peak (2005 *OECD Economic Survey of Korea*). In establishing green certificates, the government should plan an exit strategy in order to avoid another disruptive bubble.

Direct government support for green industries raises a number of policy challenges, such as choosing which sectors should receive support, the appropriate timing of assistance and the suitable policy instrument. These decisions entail inherent risks, as illustrated by the mixed results of past government efforts to identify growth engines (OECD, 2004). Efforts to "pick winners" are inherently risky given the pace of innovative change and the possibility of being locked into the wrong technology. Moreover, there is a risk of losing significant amounts of public funds. To avoid government failure, policies to promote

29. A firm could be certified as a venture business by the Small and Medium Business Administration if it met one of three criteria: *i)* it received equity investment from venture capitalists amounting to more than 10% of its capital; *ii)* the amount (over 50 million won) and intensity of its R&D spending was high; and *iii)* it used new technologies. As of 2004, only 5% and 18% of venture businesses qualified under the first two criteria, while 77% were approved under the less stringent third criterion.

green industries should be as neutral as possible, focusing on basic and long-term R&D in technologies that are still too far from commercial viability to attract private investment. In sum, measures to promote green growth should not revert to traditional industrial policies.

The priority should be to establish a framework that will promote the transformation to a low-carbon economy at a low cost. *First*, as noted above, it is essential to establish a price for carbon through an ETS and a carbon tax. *Second*, fossil fuel subsidies should be phased out. *Third*, the shift towards a low-carbon economy requires the reallocation of labour and capital resources across sectors. For workers, labour market flexibility to promote the redeployment of workers and effective training are required (OECD, 2010c). *Fourth*, strong competition, including openness to imports and foreign direct investment, is needed to stimulate the adoption of new technology. In particular, it is important to facilitate the entry of new firms, which account for a large share of radical innovations in some fields, and the exit of firms in declining industries. In addition, the government should reduce barriers to imports of products important for climate change technology. A recent OECD study found that Korea's trade barriers in this regard are high compared to those in the EU, Japan and the United States (Steenblik and Kim, 2009).

A well-designed framework and appropriate government policies will facilitate the shift to a low-carbon economy. In 2008, energy-intensive industries, such as steel, petro-chemicals and cement, accounted for 12% of total value-added in Korea, the highest in the OECD area and well above the OECD average of 8% (Figure 7). The role of the industrial sector is also evident in a decomposition of final energy consumption by sector (Table 8). While per capita energy use in the transport, residential and commercial sectors was below the OECD average, it was almost 50% above the OECD average in industry. In contrast to the high share of energy-intensive industry in GDP, the share of the service sector in Korea is one of the lowest at 60% of value added. Energy intensity in services in Korea is less than one-third of that of manufacturing. One of the benefits of developing the service sector would be to reduce energy-intensity.[30] Such an approach would help achieve the government's target of reducing energy intensity by one-third from the 2006 level by 2020, reaching the OECD average (Figure 2).

Table 8. Per capita energy use by sector in major OECD countries
Toe per capita in 2007

	Total primary energy supply	Total final consumption per capita				
		Total	Industry	Transport	Residential	Commercial
Canada	8.13	6.19	2.43	1.75	0.97	0.92
United States	7.67	5.20	1.48	2.08	0.88	0.67
Korea	**4.57**	**3.02**	**1.56**	**0.62**	**0.38**	**0.38**
France	4.12	2.58	0.73	0.71	0.65	0.33
Japan	4.03	2.68	1.11	0.65	0.39	0.50
Germany	4.02	2.83	1.01	0.67	0.70	0.26
United Kingdom	3.46	2.34	0.64	0.73	0.66	0.26
Italy	3.02	2.36	0.80	0.70	0.47	0.24
OECD Total	**4.61**	**3.17**	**1.06**	**1.04**	**0.58**	**0.39**

Source: IEA/OECD (2009a).

Improving the quality of life through better air quality

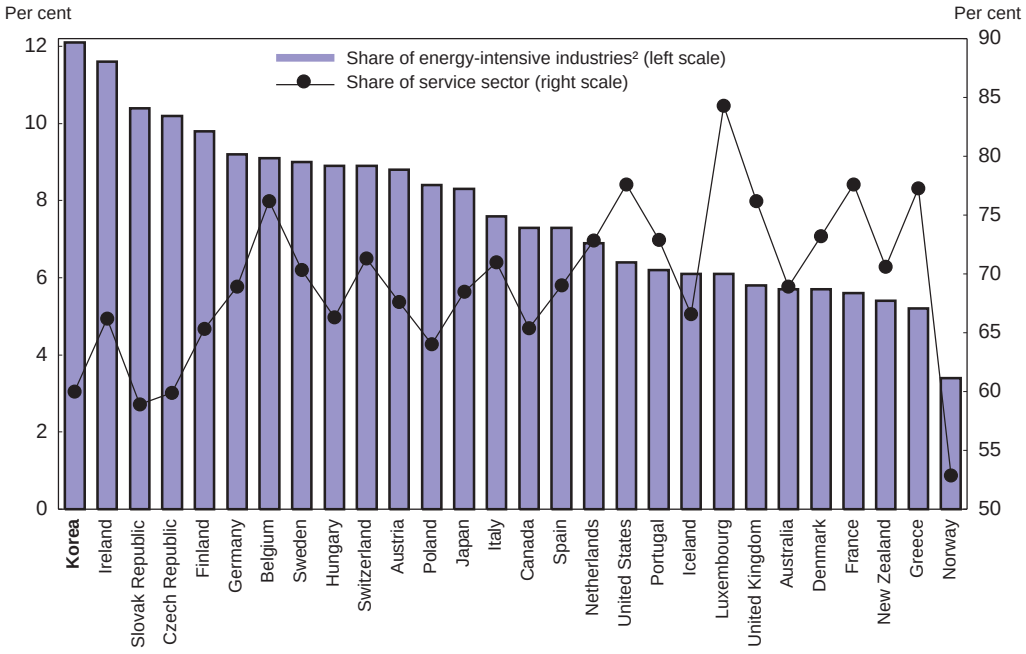
One of the benefits from cutting GHG emissions is the accompanying reduction in air pollutants, which have negative effects on human health, water quality and crop yields. Recent studies have found that

30. Indeed, a long-term econometric model estimates that reductions in GHG emissions would cause a significant expansion of the service sector (de Serres *et al*., 2010).

climate change and air quality are closely interrelated with respect to the sources, atmospheric processes and environmental effects, reflecting the fact that fossil fuel combustion is a major source of both air pollution and GHG. One study found that cutting CO_2 emissions by 10-20% compared to a BAU baseline would reduce sulphur dioxides (SO_2) by the same amount and nitrogen oxides (NOx) by 5% to 10% over the next 10 to 20 years (IPCC, 2007). The benefit, in terms of premature deaths avoided thanks to reduced air pollution, is estimated to be up to $50 per tonne of CO_2 equivalent removed (Burniaux *et al*., 2008).

Improving air quality is a priority in Korea, given that in the capital region (Seoul, Incheon and parts of Gyeonggi province), it is one of the worst among OECD countries (Kim and Kang, 2009). Although the level of emissions relative to GDP is below the OECD average (Figure 8), the concentration of emissions in the capital region, which accounts for one-half of the population, is problematic. Moreover, the increase in emissions of NOx between 1990 and 2007 was the third highest in the OECD area (Panel C). The government's objective is to improve air quality in the capital region to the average OECD level by 2014.

Figure 7. Share of energy-intensive industries and the service sector across OECD countries
Relative to total value added in 2008 or latest year[1]

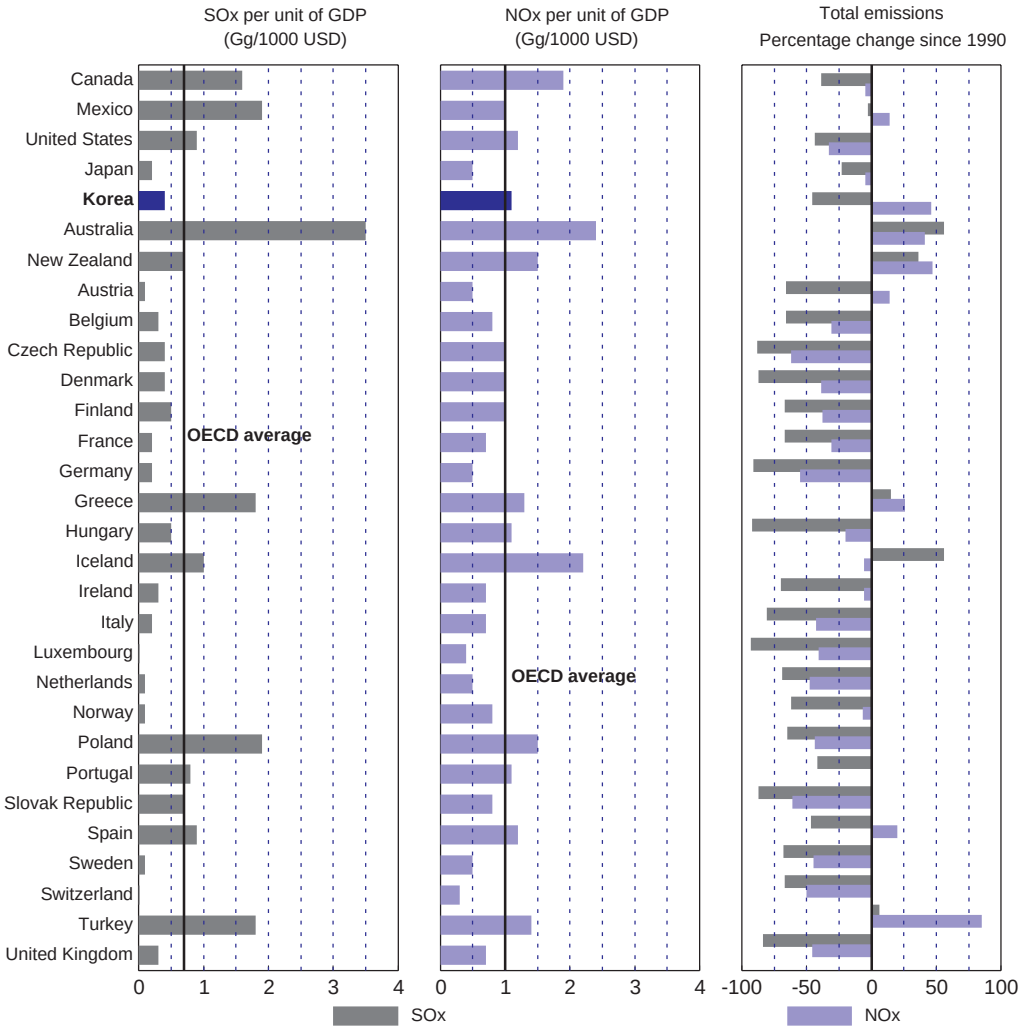


1. The data are for 2007 for Germany, Hungary, Poland, Sweden, Switzerland, United Kingdom and the United States, 2006 for Japan, New Zealand and Portugal, and 2005 for Australia and Canada,
2. Energy-intensive industries are defined as ISIC 21-28.

Source: *OECD STAN Database*.

To that end, an emission cap-and-trade programme was introduced in 2008 covering NOx, SOx and Total Suspended Particles (TSP) in the capital region. The system began with large-scale emitters and was extended to mid-size emitters in January 2010, targeting 136 factories in the capital region. It thus covers 84% of NOx, 78% of SOx and 57% of TSP emissions in the capital region. The emission levels of the three pollutants are allocated to each source within the overall total limit. Emitters with excess pollution are able to purchase emission permits from those with surplus emission allowances. In case emitters exceed their allocated amount, they have to pay a penalty charge and their permissible emission level is reduced for the following year. While the trading system applies to fixed sources of emissions, vehicles are a major pollution source in the capital region, accounting for around half of NOx emissions. Although the AFE regulations introduced in 2006 have increased fuel efficiency, the standards remain well below those in EU countries and Japan.

Figure 8. International comparison of emissions of NO_x and SO_x in 2007



Source: OECD (2010d), *OECD Environmental Data: Compendium 2009-10*, OECD, Paris.

Conclusion

To achieve its target of reducing GHG emissions, Korea should remove fossil fuel subsidies and introduce an emissions trading system based on cap and trade, supplemented by a carbon tax in areas not covered by trading. Such a market approach would minimise the overall economic cost of emission reductions by equalising marginal abatement costs across all emission sources. In addition, it would establish a credible price for carbon that would encourage innovation to reduce emissions. The government's Five-Year Plan should be carefully designed and implemented to promote such innovation and encourage the transition from energy-intensive industry to a low-carbon economy. The large-scale expenditures should be used efficiently while limiting the risk of government failure resulting from policies to "pick winners". Specific policy recommendations to improve Korea's climate change and green growth policy are provided in Box 3.

Box 3. Summary of recommendations for Korea's green growth strategy

Mitigating climate change

- Introduce market-based instruments as soon as possible to achieve the 2020 GHG emission reduction target in a cost-effective way by ensuring that abatement costs are equal at the margin across all options.
- Put a price on carbon emissions by creating a mandatory and comprehensive cap-and-trade ETS, thereby providing a clear price signal that enables market participants to make appropriate investment decisions.
- Auction ETS permits and allow them to be banked for the future and, perhaps, borrowed.
- Introduce a carbon tax in areas not covered by the ETS and use the revenue, together with that from auctioning permits for the ETS, to reduce the need for higher taxes and their associated distortions.
- Accelerate the phasing out of environmentally-harmful energy subsidies and ensure that energy prices in each sector reflect the cost of production and distribution.
- Stop earmarking environmental taxes for transport construction, especially roads.

Creating new engines for growth

- Ensure good framework conditions, including openness to foreign investment and a strong competition framework, to facilitate entry of new firms and the exit of firms in declining industries.
- Enhance flexibility in the labour market and ensure adequate training of workers to facilitate the transition toward a greener economy.
- Ensure that the spending in the Five-Year Plan for Green Growth – 2% of annual GDP over 2009-13 – is implemented in a transparent and effective manner to address market failures, while avoiding outlays designed to boost specific industries.
- Promote innovation in green technologies by increasing its share in public R&D, focusing on basic research, particularly in areas related to large-scale projects by the private sector and in technologies still too far from commercial viability to attract private investment.
- Improve the overall innovation framework by spending more on basic research, closely linking government research institutes, universities and industry and reducing the mismatch between human resources and research spending in universities.
- Encourage the development of renewable energy resources by removing non-economic barriers and establishing a predictable and transparent support framework with incentives that decrease over time.
- Design the green certificate programme and the green finance initiatives carefully to limit the risk of bubbles.

Improving the quality of life through a better environment

- Gradually reduce the level of emissions allowed under the cap-and-trade programme covering NOx, SOx and TSP in the capital region to improve air quality to the level in advanced OECD countries.
- Increase the Average Fuel Efficiency standards to reduce NOx emissions, notably in the capital region.

Bibliography

Bosetti, V., C. Carraro and E. Massetti (2008), "Banking Permits: Economic Efficiency and Distributional Effects", *CESifo Working Paper Series,* No. 2214, Munich.

Bosetti, V., C. Carraro, R. Duval, A. Sgobbi and M. Tavoni (2009), "The Role of R&D and Technology Diffusion in Climate Change Mitigation: New Perspectives Using the WITCH Model", *OECD Economics Department Working Papers,* No. 664, OECD, Paris.

Burniaux, J., J. Chateau, R. Duval and S. Jamet (2008), "The Economics of Climate Change Mitigation: Policies and Options for the Future", *OECD Economics Department Working Papers,* No. 658, OECD, Paris.

Burniaux, J., J. Chateau, R. Dellink, R. Duval and S. Jamet (2009), "The Economics of Climate Change Mitigation: How to Build the Necessary Global Action in a Cost-Effective Manner?", *OECD Economics Department Working Papers,* No. 701, OECD, Paris.

de Serres, A., F. Murtin and G. Nicoletti (2010), "A Framework for Assessing Green Growth Policies", *OECD Economics Department Working Papers,* No. 774, OECD, Paris.

Duval, R. (2008), "A Taxonomy of Instruments to Reduce Greenhouse Gas Emissions and their Interactions", *OECD Economics Department Working Papers,* No. 636, OECD, Paris.

Ellis, J. and D. Tirpak (2006), *Linking GHG Emission Trading Systems and Markets*, OECD/IEA, Paris.

Goodstein, E. (2007), *Economics and the Environment*, John Wiley & Sons, Chichester, U.K.

Government of Korea (2008), *The National Energy Master Plan 2008-2030*, Seoul.

Government of Korea (2009), *Restoration of Four Rivers*, Seoul.

Hascic, I and N. Johnstone (2010), "The Invention and Transfer of Climate Change Mitigation Technologies: Evidence Based on Patent Data", (www.oecd.org/environment/innvoation).

IEA/OECD (2006), *Energy Policies of IEA Countries: Korea*, IEA/OECD, Paris.

IEA/OECD (2008a), *Energy Technology Perspectives, Scenarios & Strategies to 2050*, IEA/OECD, Paris.

IEA/OECD (2008b), *Deploying Renewables: Principles for Effective Policies*, IEA/OECD, Paris.

IEA/OECD (2009a), *Energy Balances of OECD countries*, IEA/OECD, Paris.

IEA/OECD (2009b), *Renewables Information*, IEA/OECD, Paris.

IEA/OECD (2010), *Energy Prices and Taxes*, *1st Quarter*, IEA/OECD, Paris.

Intergovernmental Panel on Climate Change (IPCC) (2007), *Fourth Assessment Report, Climate Change 2007*, Paris.

Kim, J. and K. Kang (2009), "A Case Study of the Innovation Impacts of the Korean Emission Trading System for NO_x and SO_x Emissions", prepared as a contribution to OECD (2010e).

Moltke, A., C. McKee and T. Morgan (2004), *Energy Subsidies: Lessons Learned in Assessing their Impact and Designing Policy Reforms*, United Nations Environment Programme.

OECD (2004), *OECD Economic Survey of Korea*, OECD, Paris.

OECD (2005a), *Environmentally Harmful Subsidies: Challenges for Reform,* OECD, Paris.

OECD (2005b), *OECD Economic Survey of Korea*, OECD, Paris.

OECD (2006), *Political Economy of Environmentally Related Taxes*, OECD, Paris.

OECD (2008a), *Biofuel Support Policies: An Economic Assessment*, OECD, Paris.

OECD (2008b), *Climate Change Mitigation; What Do We Do?*, OECD, Paris.

OECD (2008c), *OECD Economic Survey of Korea*, OECD, Paris.

OECD (2008d), *Recommendation of the Council on Good Practices for Public Environmental Expenditure Management,* (www.oecd.org/dataoecd/10/46/38787377.pdf), OECD, Paris.

OECD (2009a), *OECD Economic Survey of Japan*, OECD, Paris.

OECD (2009b), *OECD Reviews of Innovation Policy: Korea*, OECD, Paris.

OECD (2009c), *OECD's Strategic Response to the Financial and Economic Crisis*, OECD, Paris.

OECD (2009d), "Progress Report on Climate Change", (www.oecd.org/document /6/0,3343,en_21571361_42445076_42572486_1_1_1_1,00.html), OECD, Paris.

OECD (2010a), *Eco-Innovation in Industry: Enabling Green Growth*, OECD, Paris.

OECD (2010b), *Measuring Innovation: A new Perspective*, OECD, Paris (forthcoming).

OECD (2010c), *OECD Economic Survey of Korea*, OECD, Paris.

OECD (2010d), *OECD Environmental Data: Compendium 2009-10*, OECD, Paris (forthcoming).

OECD (2010e), *Taxation, Innovation and Environment*, OECD, Paris (forthcoming).

Philibert, C. and J. Reinaud (2004), "*Emissions Trading: Taking Stock and Looking Forward*", http://www.oecd.org/dataoecd/58/59/32140134.pdf, OECD/IEA, Paris.

Presidential Committee on Green Growth (2009a), *National Strategy for Green Growth and Five-Year Plan*, Seoul (in Korean).

Presidential Committee on Green Growth (2009b), *Road to our Future: Green Growth*, Seoul.

Steenblik, R. and J. Kim (2009), "Facilitating Trade in Selected Climate Change Mitigation Technologies in the Energy Supply, Buildings, and Industry Sectors", *OECD Trade and Environmental Working Papers,* 2009/2, OECD, Paris.

Stern, N. (2007), *The Economics of Climate Change: The Stern Review*, Cambridge University Press.

UNEP (2008), *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World*, September, UNEP, New York.

UNEP (2009a), *Global Trends in Sustainable Energy Investment 2009*, UNEP, New York.

UNEP (2009b), *Overview of the Republic of Korea's Green Growth National Vision: An Interim Report,* UNEP, New York.

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SELF-REPORTING QUESTIONNAIRE FOR G20 COUNTRIES

1. Has your country developed a national strategy or plan on green growth, green economy, sustainable development, or similar? Or has your country integrated green growth, sustainable development, or similar considerations into your national economic or development plans?

If so, please provide details on:

- The title of the relevant plan or strategy, when it was agreed and by what government authority.
- The main content and objective of the plan or strategy, such as:
    - Key sectors targeted
    - Particular risks and vulnerabilities faced by your country that the strategy is intended to address
- A link to a website containing the plan (if available).

Earlier this year, President Obama laid out a *Blueprint for an America Built to Last*, outlining a series of ideas to build an economy that works for everyone. A key element of this plan is the promotion of homegrown and alternative energy sources through further developing our own energy resources and transitioning to cleaner sources of energy. The centerpiece of President Obama's plan to develop and use more clean energy calls for establishing a "clean energy standard" that would lead to clean sources accounting for 80 percent of our electricity by 2035. The plan also calls for incentives to promote the manufacturing and deployment of clean energy technologies, and directs the U.S. military to increase its use of renewable energy.

Further details on this Blueprint can be found here:
http://www.whitehouse.gov/blog/2012/01/24/blueprint-america-built-last

Further details on the commitment to clean energy can be found here:
http://www.whitehouse.gov/blog/2012/01/26/everything-you-need-know-president-obamas-blueprint-american-made-energy

This clean energy commitment builds upon the *Blueprint for a Secure Energy Future* released last year. This document laid out a strategy for making America a global leader in clean energy by: increasing clean electricity generation through a clean energy standard, eliminating wasteful fossil fuel subsidies, providing incentives to manufacture and deploy clean energy technologies, and permitting clean energy on public lands. It also called for developing a more efficient and advanced transportation sector through setting new fuel economy standards for both passenger and heavy-duty vehicles, providing incentives to develop and deploy advanced technology vehicles, and supporting the development of next generation transportation fuels. And it included a range of programs to promote greater energy efficiency across the U.S. economy, from homes and appliances to buildings and industry.

The one-year progress report on the *Blueprint for a Secure Energy Future* can be found here:
http://www.whitehouse.gov/blog/2012/03/12/blueprint-secure-energy-future-one-year-progress-report

2.Does your country have any specific policy instruments in place to integrate green growth or sustainable development policies into structural reforms? These might include, for example, environmentally-related taxes or auctioned permits for emissions trading, reform of environmentally harmful and inefficient subsidies, environmental performance standards or changes in innovation policies that can facilitate green innovation, policies to encourage energy or resource efficiency, incorporation of green considerations in network infrastructure provision policies (e.g. transport, energy), approaches to open up markets for green products and activities (including via removal of trade or investment barriers), approaches to strengthen domestic production of green products and activities, improvements in education, skills and training policies that can facilitate transition to green jobs, social policies to mutually reinforce growth and environment, complementary policies that protect the poor or vulnerable, etc.

If so, please provide details for each instrument on:

- The name of the policy instrument or reform and when it was put in place.
- How it works in practice.
- Any information or analysis available on the historical or expected future impacts of the instrument in terms of:
    - fiscal revenues raised or government expenditures
    - economic effects (e.g. on GDP)
    - employment effects
    - distributional effects (e.g. on low income households)
    - innovation incentives
    - environmental effects (e.g. air pollution or greenhouse gas emissions, waste production)

Action to promote a green economy has been taken by President Obama and many of the U.S. federal agencies. This action both builds the nation‘s capacity to manage materials, and accelerates the public dialogue necessary to create a green, resilient, competitive, and sustainable economy in the future. This action is taking place in the government and private sectors through a variety of policy instruments. Below are several examples of U.S. governmental initiatives on green economy:

Strengthening Domestic Production of Clean Energy

Doubling Clean Energy Generation: The Obama Administration has made the largest investment in clean energy in history and the United States has nearly doubled renewable energy generation since 2008. In fact, last year, according to industry experts, the United States reclaimed the title as the world’s leading investor in clean energy technologies.

Eliminating Wasteful Fossil Fuel Subsidies: The Obama Administration has called for the elimination of $4 billion per year in inefficient fossil fuel subsidies, both in its FY 2013 Budget and in its national strategy submitted to the G-20 as part of the commitment to rationalize and phase out inefficient fossil fuel subsidies.

Financing Deployment: Through loan programs, DOE has supported nearly 40 clean energy projects that are expected to employ more than 60,000 Americans, generate enough clean electricity to power nearly 3 million homes and displace nearly 300 million gallons of gasoline annually. The programs are supporting the world's largest wind farm, the first new U.S. nuclear plant in three decades, and several of the largest solar photovoltaic generation facilities.

To support the continued manufacture, development, and deployment of clean energy technologies, the Obama Administration's FY 2013 Budget calls for $5 billion in tax credits that will catalyze nearly $20 billion of total investment in manufacturing capacity for clean energy technologies and create tens of thousands of new construction and manufacturing jobs. The FY 2013 Budget also proposes to extend the 1603 "payments in lieu of tax credits" program and the Production Tax Credit (PTC) for electricity from renewable sources like wind.

Permitting Clean Energy on America's Public Lands: The Department of the Interior (DOI) is working to permit 10,000 megawatts of renewable generation capacity — enough to power 3 million homes — from new projects by the end of 2012. The Department is also making progress on establishing a foundation for renewable energy development on public lands in the future. DOI has launched several important landscape level planning efforts including the Solar Programmatic Environmental Impact Statement (PEIS) that DOI is developing jointly with the Department of Energy. Offshore, DOI is continuing to make progress in its "smart from the start" planning efforts to identify suitable areas for future wind energy development. Wind energy areas have been identified offshore in several states, with steps being taken to move toward holding the first competitive lease sales by the end of 2012. DOI is also proceeding with the permitting of a right-of-way for an offshore "backbone" transmission project that would be capable of transmitting up to 7,000 MW of offshore wind energy to the grid in the Mid-Atlantic States.

Green Innovation

The Advanced Research Projects Agency-Energy (ARPA-E): In 2009, the Administration funded ARPA-E for the first time ever with $400 million as part of the Recovery Act. The new agency invests in projects that swing for the fences – high-risk, high-reward efforts to develop transformational energy technologies that hold the potential to radically shift our Nation's energy reality.

Building upon the initial investment, in late September 2011, the ARPA-E program announced 60 cutting-edge research projects in 25 states. In total, The ARPA-E has supported more than 120 individual projects. Projects include: work to develop improved energy storage devices for the electric grid; intelligent building systems; next generation vehicle batteries that could make longer range electric cars that are cheaper to own and operate than today's gasoline cars; and groundbreaking new liquid fuels that could be produced from bacteria in combination with carbon dioxide and chemical energy or electricity.

After just two years, many of ARPA-E's projects are already generating additional private sector investment. Eleven of the projects have collectively garnered more than $200 million in private outside funding after an original investment from ARPA-E of just $39.1 million. Also, several new ventures have already formed spin-off companies from ARPA-E-funded projects, creating yet more new technologies, products, and jobs.

Bringing Together the Best Minds to Advance Critical Energy Research and Development: In order to catalyze innovation, the Obama Administration has launched a series of clean energy innovation hubs, which bring together teams of the best researchers and engineers in the United States to achieve major energy goals. In 2010, the first Energy Innovation Hubs began operations with some of the top scientists from academia, industry, and government charged to collaborate and overcome known barriers in energy technology. The first three hubs focused on how to build more-efficient nuclear reactors, design more energy efficient buildings, and produce biofuel from the sun.

Modeled after the concentration of brainpower and resources that defined the Manhattan Project, these integrated research centers combine basic and applied research with engineering to accelerate scientific discovery in these critical energy issues. In FY 2012, Congress partly funded the President's request to double the number of hubs – providing resources to launch two new hubs this year. The Batteries and Energy Storage Hub will focus on accelerating research and development of electrochemical energy storage for transportation and the electric grid. The Critical Materials Hub will primarily focus on technologies and approaches that increase the availability and reduce or eliminate the need for critical materials for energy efficiency and renewable energy systems. Together, the five hubs will shorten the path from laboratory innovation to technological development, and lead the way toward American competitiveness, economic growth and energy security.

Bolstering Advanced Vehicle Manufacturing Capability: To help realize the President's goal of putting one million electric vehicles on the road by 2015, the Department of Energy (DOE) has supported battery and component manufacturing facilities, research and development, deployment of electric vehicle charging infrastructure, and community-based grants to help cities plan for electric vehicles and adopt innovative policies to facilitate market acceptance. By 2015, the United States will be able to produce enough batteries and components to support one million plug-in hybrid and electric vehicles. In 2009, the U.S. had only two factories manufacturing advanced vehicle batteries. Since then, we have supported 30 new advanced battery and electric vehicle component plants that are opening across the country.

In addition to electric vehicles, the U.S. is pursuing policies that will facilitate advanced natural gas vehicles and efficient heavy-duty trucks. Earlier this year, the Advanced Research Projects Agency – Energy (ARPA-E) announced that it will launch a new research competition to find ways to harness our abundant supplies of domestic natural gas for vehicles. The Energy Department's SuperTruck initiative is focused on increasing the fuel efficiency of long haul trucks, or 18-wheelers, by 50 percent by 2015. To achieve this goal, companies are developing and improving vehicle technologies in engine efficiency, aerodynamics, waste heat recovery, and hybridization, among other approaches. Through these types of improvements, the Energy Department estimates fuel economy increases could save long-haul truckers more than $15,000 per truck per year in fuel costs.

Transformative Discovery in Energy Science: In August 2009, the Office of Basic Energy Sciences in the U.S. Department of Energy's Office of Science established 46 Energy Frontier Research Centers (EFRCs). These Centers involve universities, national laboratories, nonprofit organizations, and for-profit firms, singly or in partnerships, and were selected by scientific peer review and funded at $2-5 million per year for a 5-year initial award period. These integrated, multi-investigator Centers will conduct fundamental research focusing on one or more of several "grand challenges" and use-inspired "basic research needs" recently identified in major strategic

planning efforts by the scientific community. The purpose of these Centers will be to integrate the talents and expertise of leading scientists in a setting designed to accelerate research toward meeting our critical energy challenges. The EFRCs will harness the most basic and advanced discovery research in a concerted effort to establish the scientific foundation for a fundamentally new U.S. energy economy. The outcome will decisively enhance U.S. energy security and protect the global environment in the century ahead.

Increasing the Efficiency of Energy and Resource Use

Fuel Economy Standards for Passenger and Heavy-Duty Vehicles: In July 2011, President Obama announced the next phase in the Administration's national program to increase the efficiency of light-duty cars and trucks. Taken together with previous steps, the standards would span model years 2011 to 2025 and represent the first meaningful update to fuel economy standards in over three decades. Under the final program, average fuel efficiency is expected to nearly double, reaching an average performance equivalent of 54.5 miles per gallon by 2025, saving consumers $1.7 trillion at the pump – roughly $8,200 per vehicle – reducing oil consumption by 2.2 million barrels a day by 2025, and slashing greenhouse gas emissions by 6 billion metric tons over the lifetime of the vehicles covered by these standards.

In August 2011, the Administration finalized the first-ever national fuel efficiency and greenhouse gas (GHG) emission standards for heavy-duty trucks, vans, and buses spanning model years 2014-2018. These standards, which were developed jointly by the Department of Transportation (DOT) and the Environmental Protection Agency (EPA), with input from key stakeholders, will cut GHG emissions by 270 million metric tons, reduce oil consumption by over 500 million barrels, and save truck owners and operators $50 billion in fuel costs over the life of the vehicles covered by the program.

Greening the Government: The President's Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, emphasizes the importance of sustainability and requires U.S. Federal agencies to meet a number of energy, water, and waste reduction targets, including 50% recycling and waste diversion by 2015. In April 2011, Federal agencies and departments released, for the first time, the Office of Management and Budget (OMB) Sustainability / Energy Scorecards. These scorecards enable agencies to target and track the best opportunities to lead by example in clean energy, and hold agencies accountable to meet a range of energy, water, pollution, and petroleum reduction targets. Data for FY 2010 indicate the Federal Government reduced direct greenhouse gas emissions and greenhouse gas emissions associated with electricity and other offsite generated energy used by the Federal government by more than 6 percent. This puts the Federal government on track to meet the goals of reducing direct emissions by 28 percent by 2020, from a 2008 baseline.

Reducing Energy Bills for Low Income Americans: Since October 2009, the Department of Energy and the Department of Housing and Urban Development (HUD) have completed energy upgrades in more than one million homes. DOE's Weatherization Assistance Program alone has completed energy efficiency upgrades in approximately 860,000 homes across the country. On average, these upgrades save American families more than $400 on their heating and cooling bills in the first year alone. The Weatherization Assistance Program has also been a successful job creator, supporting an average of approximately 20,000 direct jobs per quarter and thousands more indirect jobs throughout the supply chain.

Improving Energy Efficiency through the ENERGY STAR Program: ENERGY STAR is a voluntary government-backed program dedicated to helping individuals protect the environment through superior energy efficiency. ENERGY STAR is the national symbol of energy efficiency, making it easy for consumers and businesses to identify high-quality, energy-efficient products. ENERGY STAR currently covers 63 product categories. In 2009 alone, Americans:

- saved $17 billion dollars off energy bills with ENERGY STAR
- saved 45 million metric tons of carbon dioxide equivalent to the annual emissions of 30 million cars
- purchased over 300 million ENERGY STAR qualified products

In addition, more than 8,700 buildings have earned the ENERGY STAR (3,900 buildings earned EPA's ENERGY STAR in 2009), and over 8,500 builder partners constructing new homes that qualify as ENERGY STAR in every state. During 2009, more than 100,000 ENERGY STAR new homes were constructed, for a total of more than 1,000,000 homes, and more than 20% of new homes in the U.S. earn the label. Cumulatively, more than 75,000 existing homes have been improved through Home Performance with ENERGY STAR.

Unlocking Investments in Industrial Energy Efficiency: The Administration has partnered with manufacturing companies, representing over 1,400 plants, to improve energy efficiency by 25 percent over 10 years. If this performance were achieved by the entire U.S. manufacturing sector over the next decade, savings in total energy costs could exceed $100 billion. The Administration will continue to take new steps to work with manufacturers and states to support investment in industrial energy efficiency. In addition, Federal agencies have partnered with state and local officials and businesses through the Economy, Energy, Environment (E3) initiative to help manufacturers streamline their operations, increase their profitability and sustainability, and become more competitive.

Empowering Consumers on E-Waste: The Electronic Product Environmental Assessment Tool (EPEAT) is a system that helps purchasers evaluate, compare and select electronic products based on their environmental attributes. Desktops, laptops and monitors that meet 23 required environmental performance criteria may be registered in EPEAT by their manufacturers in 40 countries worldwide. Registered products are rated Gold, Silver or Bronze depending on the percentage of 28 optional criteria they meet above the baseline criteria. EPEAT ratings are product assessments against lifecycle environmental performance criteria. These criteria are developed through stakeholder consensus and are contained in the IEEE 1680 Family of Standards for Environmental Assessment of Electronic Products. EPEAT operates an ongoing verification program to assure the credibility of the registry. In 2008, U.S. purchases of EPEAT registered laptops, desktops, and monitors over conventional products resulted in reductions in the use of toxic materials, including mercury, by 1,021 metric tons and reduction of over 1.57 million metric tons of greenhouse gas emissions over the useful life of the products.

Reduce, Reuse and Recycle: In 2002, the U.S. Environmental Protection Agency (EPA) issued "*Beyond RCRA: Waste and Materials Management in the Year 2020*." This report describes the need to shift from a waste management approach to materials management: a "cradle-to-cradle" approach aimed at reducing environmental impacts throughout the life cycle of products, materials, and activities. In 2009, "*Sustainable Materials Management: The Road Ahead*" http://www.epa.gov/epawaste/inforesources/pubs/vision.htm was released. This report is focused on 1) knowing and reducing the life cycle impacts across the supply chain; 2) using less material

inputs (reduce, reuse, recycle); 3) using less toxic and more renewable materials; and 4) considering whether services can be substituted for products.

Responsible Appliance Disposal Program: EPA's Responsible Appliance Disposal (RAD) Program is a voluntary partnership program that began in October 2006 to help protect the ozone layer and reduce emissions of greenhouse gases. As part of the RAD program, partners recover ozone-depleting chemicals from old refrigerators, freezers, window air conditioners, and dehumidifiers. Using best practices, RAD partners ensure that:

- Refrigerant is recovered and reclaimed or destroyed
- Foam is recovered and destroyed, or the blowing agent is recovered and reclaimed
- Metals, plastic, and glass are recycled
- PCBs, mercury, and used oil are recovered and properly disposed

Public-Private Partnerships

SmartWay Transport Partnership: The SmartWay Transport Partnership is a public-private partnership that uses market mechanisms to improve energy efficiency in the goods movement sector. The Partnership has accelerated the adoption of advanced technologies and operational practices that save fuel, save money and reduce emissions from freight operations. SmartWay partners include trucking companies, shippers, logistics providers, and rail carriers. SmartWay Partners have saved 1.5 billion gallons of diesel fuel from goods movement, saving partners $3.6 billion in operating costs while reducing 14.7 million metric tons of CO_2.

Working with Industry to Reduce Chemical Use: EPA's Design for the Environment (DfE) program works in partnership with industry, environmental groups, and academia to reduce risk to people and the environment by finding ways to prevent pollution. For more than 15 years, through partnership projects, DfE has evaluated human health and environmental concerns associated with traditional and alternative chemicals and processes in a range of industries. These analyses have empowered hundreds of businesses to select safer chemicals and technologies. DfE focuses on industries that combine the potential for chemical risk reduction with a strong motivation to make lasting, positive changes. More recently, DfE has been helping consumers and industrial purchasers make wise choices by identifying safe and effective products. It has evaluated and allowed more than 1,500 products to carry the DfE logo. As incentives to businesses for participation and driving change, DfE offers EPA technical tools, methodologies, and expertise. This expertise in Green Chemistry, toxicology, and modeling enables industry to identify safer alternatives to chemicals of concern. Every year, DfE programs reduce the use of chemicals of concern by hundreds of million pounds. www.epa.gov/dfe

Green Jobs

Environmental Workforce Development and Job Training Grants: The Environmental Workforce Development and Job Training Grants (EWDJT) help residents take advantage of the jobs created by the management, assessment, cleanup, and revitalization of solid and hazardous waste sites in their communities. EWDJT provides local residents of communities historically impacted by brownfields and other environmentally contaminated properties or waste related facilities an opportunity to take environmental training offered through the programs. To date (since 1998), EPA has funded 169 job training grants totaling over $35 million through the former Brownfields Job Training Program. As of April 2010, more than 5,800 people had completed training and more than 3,800 obtained employment in the environmental field with an average starting hourly wage of $14.65.

USDA Forest Service Job Corps Civilian Conservation Centers (CCCs) are training students to work in a greener economy. The CCC offers opportunities for underserved youth to acquire training to compete for jobs in industries such as carpentry, natural resources, health care, and culinary arts. By incorporating green aspects into these fields, graduates will be better equipped to contend for jobs in the changing economy. "Green jobs are an extremely important part of rebuilding the American economy," said Agriculture Secretary Tom Vilsack. Because of the new direction, "generations of Job Corps graduates will make our nation healthier, more energy-independent and our public lands more resilient to the effects of climate change." The Forest Service CCCs have provided underserved youth vocational training for 45 years. USDA operates 28 programs across 18 states with a capacity of 6,200 students. Six additional agencies support this new effort of the USDA.

Green Jobs Career Data: The U.S. Bureau of Labor Statistics recently released a formal definition on "green jobs" and issued a report on Careers in Wind Energy. For more information on BLS green jobs data and initiatives, please visit http://www.bls.gov/green/home.htm. The U.S. resource on occupational competencies is an online tool and searchable database known as the Occupational Information Network (O*NET) system. In 2008–2009, the O*NET began research to add green jobs information to the current occupational database. The project conducted a literature review and analysis and released a report in February 2009 entitled *Greening of the World of Work: Implications for O*NET-SOC and New and Emerging Occupations* (http://www.onetcenter.org/reports/Green.html). For more information on O*NET, please visit http://www.onetcenter.org/green.html.

Department of Labor Green Jobs Grants: The Department of Labor (DOL) plays a key role in growing the clean energy economy. The American Recovery and Reinvestment Act included $500 million in funding for a competitive grants program for research, worker training and placement, and labor exchange in the energy efficiency and renewable energy sectors of the economy. These grant programs have played an important role in connecting other Federal agencies' green training and job creation programs with the workforce investment system to forge a government-wide approach to the development and expansion of the workforce for these critical industries. Some examples of these grant programs include:

- **State Energy Sector Partnership and Training Grants:** To highlight the important role States play collectively in building a national green economy, the DOL is investing in workforce sector strategies that target energy efficiency and renewable energy industries as well as other green industries. The grants provide training and placement services in the energy efficiency and renewable energy industries for workers impacted by national energy and environmental policy, individuals in need of updated training related to the energy efficiency and renewable energy industries, and unemployed workers.
- **Energy Training Partnership Grants:** The grants provide training for workers that will prepare them to enter the energy efficiency and renewable energy industries, as well as green occupations within other industries. These grants invest in partnerships made up of a diverse set of stakeholders that utilize these partnerships to design and distribute training approaches that lead to portable industry credentials and employment, including registered apprenticeship.
- **Green Jobs Labor Market Information:** These grants support innovative approaches for identifying and obtaining information on green jobs at the state level. One of these grantees, a consortium of eleven states, is conducting ground-breaking research on ways

to use data-mining of job postings available on the Internet to conduct real-time identification of skill demands from employers. This new approach to data collection on skill demands will address some of the limitations or drawbacks of typical employer surveys.

- **Green Jobs for Youth:** DOL also received funding in the Recovery Act for Job Corps, an intensive education and training program for at-risk youth, and for the YouthBuild program, created to help at-risk youth gain education and occupational credentials while building or rehabilitating affordable housing. Both Job Corps centers and YouthBuild programs are implementing green curricula and many Job Corps facilities employ green technology. For more information on YouthBuild and green jobs, please visit http://www.ybshadesofgreen.org/. For more information on Job Corps and green jobs, please visit http://www.jobcorps.gov/AboutJobCorps/recovery.aspx.

From: Urbanas, Elizabeth (Beth)
To: McDonald, Gordon
Cc: Demopulos, Abigail
Subject: (b) (5)
Date: Tuesday, September 04, 2012 5:04:03 PM
Attachments: (b) (5)

Gordon I have updated our priorities presentation a bit. Here it is.

From: Urbanas, Elizabeth (Beth)
To: Metcalf, GilbertDisabled; Demopulos, Abigail
Subject: (b)(5) [redacted]
Date: Wednesday, February 01, 2012 2:00:56 PM
Attachments: (b) (5) [redacted].
Importance: High

Here is the list of priorities for the presentation on Thursday. I have used the same general format as the one given us as an example (other directors have told me they are using this as a template too).

Please clear when you can today.

From: Tonkonogy, Bella
To: Das, Himamauli
Cc: Demopulos, Abigail; Urbanas, Elizabeth (Beth)Disabled
Subject: FW: private sector strategy info memo
Date: Friday, March 16, 2012 4:52:12 PM
Attachments: (b) (5) [redacted]

Him-

For your clearance, thanks.

From: Metcalf, Gilbert
Sent: Friday, March 16, 2012 4:42 PM
To: Tonkonogy, Bella
Cc: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: RE: private sector strategy info memo

I reworked the summary some. Otherwise no significant changes. Thanks very much.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Tonkonogy, Bella
Sent: Friday, March 16, 2012 4:01 PM
To: Metcalf, Gilbert
Cc: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: private sector strategy info memo

Gib,

Attached is the draft info memo you requested regarding our private sector strategy. Beth has cleared. Will send to Him once we have your clearance.

Thanks,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

From:	Das, Himamauli
To:	Demopulos, Abigail
Subject:	(b)(5)
Date:	Friday, March 16, 2012 5:16:42 PM
Attachments:	(b) (5)

Wrong abby Demopulos.

Himamauli Das / Himamauli.Das@treasury.gov / (202) 622-1147

From: Das, Himamauli
Sent: Friday, March 16, 2012 5:12 PM
To: Tonkonogy, Bella
Cc: Das, Himamauli; 'Demopulos, Abigail'; Urbanas, Elizabeth (Beth)
Subject: FW: private sector strategy info memo

Thanks Bella. Please see a couple of suggestions/comments.
Thanks, Him

Himamauli Das / Himamauli.Das@treasury.gov / (202) 622-1147

From: Tonkonogy, Bella
Sent: Friday, March 16, 2012 4:52 PM
To: Das, Himamauli
Cc:
Subject: FW: private sector strategy info memo

Him-

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Sent: Friday, March 16, 2012 4:42 PM
To: Tonkonogy, Bella
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Deputy Assistant Secretary for Environment and Energy
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Subject: private sector strategy info memo

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Thanks,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

[redacted]

From: Strauss, Michael
Sent: Monday, July 02, 2012 2:29 PM
To: Metcalf, Gilbert
Cc: Black, Laura; McDonald, Gordon
Subject: FW: International Affairs, Office of Environment and Energy

Gib,

As we discussed this morning, I'm passing on below a letter of interest and resume for [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

NR [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] I also studied closely other environmental financial mechanisms, including carbon cap and trade and carbon tax policies, and the CDM. NR [redacted]

[redacted]

[redacted]

[redacted]


NR

From: Hall, Daniel
To: Daniel Hall
Subject: coal plant memo
Date: Friday, January 27, 2012 5:48:00 PM
Attachments: (b) (5) [redacted]

Daniel Hall
Office of Environment and Energy
U.S. Department of the Treasury
Phone: (202) 622-7801
Fax: (202) 622-6728
Email: daniel.hall@treasury.gov

From: Daniel Hall
To: Hall, Daniel
Subject: resume
Date: Friday, February 24, 2012 8:07:19 AM
Attachments: NR [redacted]

From: Hall, Daniel
To: Jaffe, Judson
Subject: coal plant memo: long version
Date: Wednesday, February 01, 2012 3:26:01 PM
Attachments: (b) (5) [redacted].

Here's the long version. I'm now going to work on a bulleted version, so the key there here is to evaluate whether the ideas covered are the right ones, whether there are additional arguments we should be making, etc.

(b) (5) [redacted]

_____

Daniel Hall
Office of Environment and Energy
U.S. Department of the Treasury
Phone: (202) 622-7801
Fax: (202) 622-6728
Email: daniel.hall@treasury.gov

From: Hall, Daniel
To: Jaffe, Judson
Subject: coal plant retirement memo: first couple pages
Date: Monday, January 30, 2012 3:10:23 PM
Attachments: (b)(5) [redacted]

A revised version of the discussion that opens the memo before the presentation of options:

From:	Jaffe, Judson
To:	Tonkonogy, Bella
Subject:	Fw: draft guidance document
Date:	Thursday, September 06, 2012 4:07:02 PM
Attachments:	BCA principles of good practice 13.docx

Was in his earlier email, below.

----- Original Message -----
From: Metcalf, Gilbert
Sent: Tuesday, September 04, 2012 10:02 PM
To: Jaffe, Judson; Tonkonogy, Bella
Cc: Urbanas, Elizabeth (Beth)
Subject: Fw: draft guidance document

Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Aaron Cosbey [mailto:acosbey@gmail.com]
Sent: Tuesday, September 04, 2012 09:56 PM
To: Metcalf, Gilbert
Subject: draft guidance document

Dear Gil

I had promised to send you this -- the draft guidance document on BCAs. A caveat needs to go with it, because the group is still trying to reach consensus on a couple of points before it can be publicly associated with all the authors' names (should be by end of month): please don't cite it or circulate it as agreed text.

It almost goes without saying that I'd be delighted to get any feedback you might have on this text (most useful if in the next three weeks). I should say I enjoyed your remarks on our panel today -- very helpful for this audience I think.

All the best,

Aaron

--
Aaron Cosbey
Associate and Senior Advisor
International Institute for Sustainable Development
www.iisd.org

A Guide for the Concerned

Guidance on the elaboration and implementation of border carbon adjustment

Draft version 13
August 2012

Table of Contents

i. Preface: Why did we create this guidance?

1. We began developing this guidance when, in 2009, the U.S. was actively considering including border carbon adjustment (BCA – fully defined below) as part of a package of climate legislation, and the EU was openly considering doing the same in the context of phase III of its Emissions Trading System.

2. In 2012, neither of these developments seems imminent. However, we assume that BCA will endure as a proposed complement to domestic climate policies, and may eventually feature as part of some countries' climate regimes. Indeed its appeal as policy option has grown for those countries that intend to move forward with domestic climate policy even in the absence of a comprehensive, internationally agreed set of targets and timetables when the first commitment period of the Kyoto Protocol comes to an end in 2013.

3. This guidance is intended to:

    - Help policy makers decide on an informed basis whether to adopt BCA;
    - If they do decide to adopt BCA, help policy makers avoid adverse outcomes to the extent possible when elaborating and implementing the BCA regime, and;
    - Help exporting nations assess schemes under which they might be targeted.

4. Our aim is that BCA should be formulated and carried out in a manner that is effective in reducing global GHG emissions, effective in achieving its intended goals at the national level, transparent, and coherent with the principles of the multilateral system of trade, the principles of the multilateral climate change regime and other internationally agreed principles and objectives.

5. We provide this guidance without making any judgments as to the desirability of BCA. We note at the outset that BCA is at best a fall-back measure in the event of collective failure at the international level to define appropriate levels of national action. At worst BCA can be a coercive, divisive and highly imperfect policy tool with serious methodological challenges. While this guidance does not measure BCA against policy alternatives such as free allocation of allowances, we recommend that it be judged against a full set of alternatives to meet the prescribed goals.

6. The guidance below begins by setting out starting points: defining what we mean by leakage and competitiveness; setting out what we see as the three basic motivations for using BCA; and describing a set of criteria that will be used to evaluate regime options at a number of points in the guidance. It then critically assesses the three enunciated motivations for BCA. It next explores how to identify those domestic sectors that should be covered by a BCA, followed by a focus on what countries should be covered. It then explores how to determine the appropriate level of adjustment, and what to do with the collected revenues. It then offers guidance on adjustment for exports, and in closing describes the governance structures that should be in place to ensure fair practice in the application and elaboration of BCA regimes.

ii. Glossary of terms and acronyms

BCA
Benchmark
Cap and trade
Carbon
CBDR-RC
Direct emissions
EITE
ETS
GATT
GHG
Indirect emissions
LDC
Leakage
LIC
MFN
S&DT
Scope 1 emissions
Scope 2 emissions
Scope 3 emissions
TBT
Trans-shipment
UNFCCC
VAT
Waxman-Markey
WTO

Others?

Summary of Recommendations

Section 2: Motivations:

Policy makers should be explicit about their motivations, which could be any or all of: preventing leakage, preserving competitiveness or exerting leverage. (para 12)

Of these three possible motivations, preventing leakage is the only motivation we consider appropriate for the use of BCA; it is ultimately an environmental motivation, concerned with making domestic climate policies effective. (paras. 13 – 24)

Section 3: Scope of applicability:

Exemptions

We recommend the following exemptions from coverage by any BCA regime: (paras. 26-36)

- Exemptions for countries with an effective national emissions cap (with trans-shipment provisions);
- Exemptions for countries taking adequate national actions other than caps, where adequacy is defined to achieve coherence with CBDR and trade law (with trans-shipment provisions);
- Exemptions for sectors covered by an effective sectoral cap, or by some equivalent measures such as export taxes (with sectoral trans-shipment provisions);
- Exemptions for LDCs and LICs *if it could be assured that this would be carved out by the WTO's Enabling Clause;*
- Exemptions for sectors or goods that fall below a *de minimus* level of imports.

The need for trans-shipment provisions necessitates a high threshold of applicability that probably excludes manufactured goods and covers only a small number of commodities. (para. 37)

Goods and sectors covered

Balancing off the need to avoid leakage (which argues for broad coverage) against the costs, the meagre returns, the legal issues and other problems (which argue for narrow coverage) leads us to the narrow end of the spectrum. (paras. 38-39)

BCA should only be used as a complement to price-based policies: cap & trade, and carbon taxes. (para. 41)

Two criteria should be used to determine which goods and sectors should be covered, both being necessary conditions:

- Vulnerability to high costs from climate regulations (use as a proxy: GHG intensity)
- Inability to pass on costs to customers (use as a proxy: trade intensity)

Section 4: Level and type of adjustment

Assessing the carbon content

System boundary:

Within the system boundary should be included: scope 1 emissions (direct emissions) and scope 2 emissions (emissions from electricity, heat or steam generated off site). Other indirect emissions should not be included. Emissions from transport to market, from consumption and disposal of goods, should also not be included, (paras 44-54)

Energy-related by-products exported off site should create emission credits, but there should be no crediting for non-energy-related exports. (paras. 51-54)

Benchmarks (paras. 55-63)

If exporters are unable or unwilling to provide third-party verified data to a protocol or standard specified by the importing jurisdiction, or if the production process is the end result of a complex value chain including suppliers from many countries, benchmarks should be used.

In the first instance, producers should be given the option to provide third-party verified firm-level data on emission intensity, using the same system boundaries used for domestic producers. Only when that is not forthcoming should benchmarks be used as a fallback

The benchmarks developed should be product-specific, and also where necessary specific to different production processes. In principle, it is preferable to have fewer benchmarks for any given product, but where a product has significantly different technologies in use (in terms of GHG intensity, abatement options), more than one benchmark will be needed.

For scope 1 emissions (direct emissions), the benchmarks should use worst-practice emissions intensity in the importing country. This option offers strong protection against leakage, but because it is only employed where firms have declined to report actual emission data it is not punitive, and offers incentives for good practice.

To counter the negative impact of such a GHG-intense benchmark we strongly recommend that implementing states offer support, in the form of financial and technical assistance in accounting, reporting and verification, to assist foreign covered exporters in submitting verified individual data.

For scope 2 emissions (energy, steam and heat generated off site) the benchmarks should use average data from the exporting countries. Fairness dictates that producers who use on-site-generation, who would otherwise have to use importing country worst practice as a benchmark, should have the option to calculate their energy-related emissions using the same exporting country average benchmark used for scope 2 emissions.

The data (para. 64)

The data submitted by producers should be measured and reported to a specified protocol and verified by a third party.

International standards and protocols should be used, where available, in the submission of data and in the construction of benchmarks.

Modifications to the adjustment level (paras. 65-67)

Levels of exporter country carbon pricing should be credited. This might include export tax policies, provided they were explicitly carbon-related.

Any free allowances or other compensatory mechanisms to shelter domestic firms need to be taken into account when calculating the amount of adjustment due. Depending on the regime, this might conceivably mean that the level of BCA is adjusted down to zero.

Special benchmarks could be developed for less developed countries (if they are not exempt), to respect the principle of CBDR-RC. This exemption would have to be accompanied by trans-shipment provisions.

Type of adjustment (para. 68)

Adjustments need not be in the form of levies. An alternative, for example, would be to allow importers or foreign producers to purchase international carbon offsets up to the determined value of adjustment.

Section 5: The application of BCA to exports

We do not recommend the use of export adjustment in BCA regimes. (paras. 69-75)

Section 6: Use of revenues from import adjustments

We recommend that one or more of the following occur in any BCA regime: (paras. 76-79)

- Refund any adjustments collected to the exporting country, either directly or to subsidize clean technology transfer;
- Contribute adjustments collected to internationally administered funds for climate change mitigation and/or adaptation;
- Designate funds collected to be disbursed by the collecting state in ways that benefit developing countries (e.g., finance for mitigation and adaptation projects).

Section 7: Other Design guidance

Pre-establishment guidance (paras. 81-82)

Trading partners should be notified of BCA proposals at an early stage, with draft text distributed to them on request. There should be opportunity for exporting countries and firms to present their comments in writing. These should be discussed upon request, and the written comments and the results of these discussions should be taken into account in the final regime design.

Entry into force of any BCA regime should give exporters and exporting country governments enough lead time to adjust their policies and practices.

Operational guidance (paras. 83-87)

An official point of contact should be designated to respond to questions and requests for documents from exporting countries and firms.

The decision-making process should be predictable and transparent, with methodologies for determining vulnerable sectors, level of adjustment and country-level applicability, for example, being public information.

Calculations with respect to individual countries and exporters should be regularly reviewed and revised where necessary. The parameters of the regime should also be regularly reviewed – at least on an annual basis. Exporting countries and firms should be able to make submissions to the review processes.

There should also regular review of BCA regimes aimed at assessing their effectiveness in meeting their stated objectives.

There should be mechanisms within the BCA regime whereby exporting countries and firms can appeal decisions and calculations that concern them.

Sunset guidance (para. 88)

The measures should be time limited and should have clear conditions for phase-out. BCA should only be intended to offer temporary effect during a period of transition to a low-carbon economy and broader international cooperation. At a minimum, the continued application of BCA should be contingent on explicit criteria related to the state of progress in achieving a low-carbon economy, and in achieving international cooperation on climate change action.

1. Starting points

What is BCA?

7. A border carbon adjustment is a measure applied to traded products that seeks to make their prices in destination markets reflect the costs they *would have* incurred had they been regulated under the destination market's greenhouse gas emission regime.[1] The adjustment can be applied either to imports or to exports. In the case of imports the charge would reflect the GHG emissions associated with imported products and the price of emissions faced by comparable products in the destination market. If applied to exports the adjustment would be a rebate of emissions charges levied in the country of origin. In a seamless system of globally applied BCA this would be followed by border adjustment in the destination market, with the objective that all products in their destination markets should reflect domestic emissions prices. This is the same arithmetic that guides VAT and excise duty adjustments at the point of import and export, though BCA is considerably more complex, as described below.

Why apply BCA?

8. The key possible motivations behind BCA are:

   - **Reducing risks of leakage.** Leakage is an increase in GHG emissions in foreign jurisdictions that results from climate policies taken in an implementing jurisdiction (see Box 1);
   - **Maintaining industry competitiveness.** Related to leakage, but distinct, this motivation is concerned about the loss of profits, market share, production, investment and related jobs. Those losses could be due to industry relocating to jurisdictions with lower costs of compliance, to industry losing market share to firms from such low-cost jurisdiction, or to diversion of new investment to those same jurisdictions.
   - **Leverage.** BCA, or the threat of BCA, might be used to bring pressure on other countries to adopt policies to reduce GHG emissions.

9. These three options are assessed in the section that follows: *Motivations*. At this point, we note that competitiveness and leakage concerns can be addressed in a number of ways. Best among these is broad-based international agreement on the acceptable levels and/or means of effort to address climate change. Indeed, global action to reduce carbon emissions is the only mechanism that can address all of the leakage channels, including leakage related to global fossil fuel market responses. But in the absence of that ideal, other

[1] We use the term "carbon" in the loose sense that includes carbon equivalent of other greenhouse gases.

climate policies will be pursued at the national level, such as carbon taxes, cap-and-trade schemes and other carbon constraints.[2]

10. The competitiveness and leakage issues that such national policies engender can be addressed through a variety of means, including special treatment to vulnerable sectors (e.g., free allocation of allowances, preferential tax treatment, or even wholesale exclusion from the climate policy), international sectoral agreements (under which one or more countries agree to regulate sectors in a similar coordinated manner), GHG intensity standards, bilateral or regional accords, or BCA. Each of these policy options has many possible permutations, and each has its inherent strengths and weaknesses. It is beyond the scope of this guidance to go into detailed comparison of the various options that compete with BCA to address competitiveness and leakage concerns, but those options should be carefully assessed by any government considering the use of BCA.

Box 1: The mechanics of leakage

Leakage can occur via any of at least three distinct channels:

- Through the relocation of existing economic activity to countries with lower costs of regulation (either through plant relocation or through domestic firms losing market share to firms with lower costs of regulatory compliance);
- Through the diversion of new investment from the regulating country to countries with lower costs of regulation;
- When regulation forces price changes that increases emissions in other countries (for example, regulations might lower domestic demand for fossil fuels, lowering the global price, increasing demand elsewhere).

A fourth channel, unrelated to competitiveness, is not considered here: as regulating jurisdictions reduce their demand for fossil fuels, global prices will fall, making energy cheaper in the rest of the world and increasing emissions intensities in non-regulating jurisdictions.

Criteria for judging BCA regime options

11. Throughout this guidance we will assess various regime design options on the basis of a consistent set of criteria. They are:

- **Environmental effectiveness:** Does the regime work to reduce GHG emissions at a global level?
- **Feasibility:** Is the regime cost effective, and does its implementation impose a reasonable administrative burden?

[2] The nature of these measures to address climate change in the implementing country are important to the BCA regime, though they are not addressed to any great extent here. It will, for example, be much simpler to implement a BCA regime as an accompaniment to domestic policies that involve carbon pricing (such as carbon taxes or cap-and-trade) than to have BCA accompany other sorts of regulatory efforts, to the point where it is argued below that BCA should not be used as a complement to non-price-related regulatory approaches (see para. 41).

- **Policy coherence:** Is the regime consistent with the multilaterally agreed principles and objectives of international trade and investment law, of the international climate regime, or of other international agreements or commitments?
- **Good governance:** Would the regime be implemented in accordance with commonly accepted governance principles such as transparency, predictability, ease of use and procedural fairness?

2. *Motivations*

12. We noted above that there were at least three possible motivations for the use of BCA. A first piece of guidance is that policy makers should be explicit about their motivations, since the design of any BCA regime will be different in important respects if it is aimed at one or another of these motivations (as will be demonstrated below).

13. A second piece of guidance is that preventing leakage is the only motivation we consider appropriate for the use of BCA. Preventing leakage is ultimately an environmental motivation, concerned with making domestic climate policies effective. Even if domestic climate policies are cast narrowly as targeting *domestic* emissions reductions, leakage can undermine the ultimate goals since GHG emissions are equally damaging no matter where they occur.

Leakage

14. We define leakage as any increase in greenhouse gas (GHG) emissions in foreign jurisdictions that results from climate policies taken in an implementing jurisdiction.[3] Leakage is an issue for environmental policy-makers who fear that it might undermine the environmental effectiveness of their regulations.

15. Leakage can occur whenever foreign emissions are not capped, either explicitly by a cap-and-trade policy or by a hard national target. For example, in countries with carbon taxes, national emissions change in response to economic changes, so emissions can technically "leak" even to such countries. On the other hand, hard caps—even weak ones with low associated carbon prices, or firm national targets under which some sectors remain unregulated—mean that overall emissions in that country cannot expand, regardless of the actions of other countries.

16. It is worth noting that national-level leakage differs from sector-level leakage, which is more related to competitiveness effects. A country with a national emissions cap can still cause leakage in a specific sector as long as emissions in other sectors shrink to respect the cap. From an environmental effectiveness perspective, though, this is not important since global emissions will not have increased.[4]

Competitiveness

17. Preventing loss of competitiveness is a purely economic concern -- concern for the effects of carbon regulation on trade-sensitive sectors. Part of this motivation is related to the emissions leakage that would be associated with the relocation of economic activity

[3] The standard formula for calculating leakage is the change in foreign emissions (specifically, the change that resulted from domestic regulation) divided by the change in domestic emissions.

[4] As noted below, however, there is an indirect environmental argument for preventing sectoral leakage if it is key to political acceptability of domestic climate action. That is, some sectors are so politically important that the prospect of sectoral leakage may deter policy makers from pursuing national-level climate action.

through trade, which can be especially pronounced in certain energy-intensive trade-exposed (EITE) sectors. Another motivation for addressing sector-level competitiveness concerns is to shore up political support (or defuse political opposition) from powerful special interests, labor groups, and elected representatives from industrial communities. It can thus be argued that preserving competitiveness, as a precondition for the domestic political acceptability of stringent economy-wide climate policy, can contribute to the global goal of emissions reductions.

18. However, we see preserving competitiveness as an inappropriate motivation for BCA for two main reasons. First, competitiveness motivations often predate climate policy, as many of the major EITE manufacturing sectors already operate in the context of economic trends that foresee continued shifts away from industrialized to emerging economies. Responding to these motivations through BCA would thwart legitimate economic drivers of comparative advantage and trade. There is an important difference between such responses and responses aimed at mitigating the changes associated with the climate policy.

19. Second, preventing the loss of competitiveness is not a valid rationale for breaching trade law obligations (see Box 2). The international community has agreed in World Trade Organization (WTO) law and in various free trade agreements that while there are some legitimate objectives —including protection of plant, animal and human life and health, and conservation of scarce natural resources—that can over-ride other trade law obligations, preserving competitiveness is not one of them. BCA as an instrument has an uncertain status under trade law, and in the end regime design would be critical to any final determination. Motivation would be one of the key deciding features.

20. An additional argument against competitiveness as an appropriate motivator for BCA is that in many cases the less problematic motivation of preventing leakage should also help prevent loss of competitiveness. There is one type of exception, discussed below: if a national exemption is granted to a country with a national emissions cap, *sectoral* emissions in that country may rise as leakage takes place to a given sector. But the effect of the cap would be that these would have to be compensated by emissions reductions elsewhere in the economy, so global emissions would not rise.

Leverage

21. The leverage motivation reflects a desire to use BCA to pressure other countries to take actions to reduce their emissions. The desired actions might take the form of a national commitment, limiting the scope for overall leakage, or sectoral agreements, which would deal with competitiveness related leakage in key sectors. Leverage as defined here is strictly about trying to change national policies, as opposed to trying to change firm-level behaviour.

22. We see leverage as an inappropriate motivation for BCA. For one thing it is likely to be ineffective. In many cases the export stream for a product is a small percentage of total country-level production, meaning limited impact at the sectoral level, and so limited

leverage to affect national policies. For another thing, it is possible that BCA as a coercive lever may backfire; the tool is so controversial and divisive that it may actually impair efforts to achieve multilateral climate agreement, rather than impel progress, meaning a missed opportunity for mitigation. Trade has become a problematic area in the climate negotiations, in part fuelled by concerns about the potential use of BCAs.

23. A particular difficulty in using BCA for leverage is the potential conflict this creates with the UNFCCC principle of common but differentiated responsibility and respective capabilities (CBDR-RC – see Box 3), which recognizes that developing countries should not be expected to implement the same kinds of policies as developed countries. That is, while preventing leakage through BCA is not coercive—it is akin to a standard that can be followed or ignored like any other with, of course, market share at stake—exerting leverage through BCA is definitely coercive. It is a measure akin to sanctions, aimed at forcing a state to change its policies. If BCA is used to bring about similar climate policies in countries regardless of capacity or historical responsibility, then the conflict with CBDR-RC is clear.

A pragmatic caveat

24. Most policy making processes are, of necessity, exercises in balancing a number of different policy objectives. As such, in the real world it is unlikely that any BCA regime might be elaborated so as to fulfil only one of the motivations described above. Nonetheless, to the extent possible, the guidance that follows tries to make recommendations that assume preventing leakage is the policy makers' only motivation.

3. Scope of applicability

25. The scope of a BCA's applicability determines which products or sectors the regime will cover, and which countries. We will first discuss what exemptions from coverage should be in place, both at the country level and at the product/sector level. We will then discuss how to identify, from among those products and sectors not exempted, which should be subject to adjustment.

Exemptions

26. There are a number of possible exemptions that could affect coverage under a BCA regime. They include exemptions for:

- Parties to a multilateral climate change agreement;
- Countries taking adequate action: national cap on emissions;
- Countries taking adequate action: national action other than emission cap;
- Countries taking adequate action: cap or equivalent on specific sector;
- Least-developed countries (LDCs) and low-income countries (LICs);
- Sectors and goods with minimal levels of imports;
- Sectors, goods or countries exempted by administrative discretion.

27. Each of these can be examined in light of the criteria identified above. The result is illustrated in Table 1, with more in-depth discussion following.

Table 1: Options for exemptions from coverage

Exemptions	Environmental effectiveness	Feasibility	Policy coherence	Good governance
Party to multilateral agreement	risk that "leverage" may backfire; need trans-shipment provisions	difficult to define what is an adequate agreement, who is in compliance	creates problems with GATT MFN obligation	
National emissions cap	no risk of overall leakage (though sectoral leakage possible); need trans-shipment provisons	if equivalent action allowed, difficult to calculate effects	creates problems with GATT MFN obligation; probably saved by GATT Art. XX	
Adequate national action	leakage not prevented; need trans-shipment provisions	difficult to define what is adequate action	can be defined so as to respect CBDR&RC, S&DT creates problems with GATT MFN obligation	lack of predictability stems from difficulty defining adequate action
Sectoral emissions cap	no risk of leakage; need trans-shipment provisons	if equivalent action allowed, difficult to calculate effects		
LDCs and LICs	probably minimal impact from exempting them; need trans-shipment provisions	fewer countries makes it administratively simpler	creates problems with GATT MFN obligation creates coherence with CBDR&RC, S&DT	
Minimal trade volumes (sector/good)	minimal impact from exempting	fewer goods/sectors makes it administratively simpler		
Exempted by administration (country)	uncertain impacts - depends on amount of emissions covered; needs trans-shipment provisions	fewer countries makes it administratively simpler	creates problems with GATT MFN obligation	lacks predictability, transparency

28. *Exempting countries that are party to a multilateral agreement on climate change.* This is in essence a use of BCA for leverage purposes, with the drawbacks argued above: primarily that it could backfire and make international agreement less likely. This exemption, like any national-level exemption, would need to be accompanied by strong trans-shipment provisions (see Box 4). These would seek to ensure that any products coming from the exempted country had in fact undergone a substantial transformation there. Otherwise it would be possible for non-exempted countries to ship products there for re-export, in an attempt to avoid coverage. This exemption would also require a definition of an adequate multilateral agreement, and perhaps even some definition of countries' compliance with that agreement. This and the trans-shipment provisions would increase administrative complexity. Because it is a national-level exemption, it creates problems with GATT's Article I obligation for most-favoured-nation treatment, which requires that no nation be favoured above any other in the treatment of imported goods (see Box 2).

29. *Exempting countries that implement a national emissions cap.* If a country has a national cap, it is by definition impossible for there to be leakage, so this is a globally effective exemption. Even if there is leakage at a sectoral level – some production shifts to the foreign country – the associated increases from the sector will have to be compensated by

reduced emissions from some other sector to maintain the cap (provided that the cap is set low enough to be actually limiting), so global emissions do not rise. This assumes, of course,

Box 4: BCA and origin determination

Any BCA regime which seeks to exempt goods on the basis of country of origin will need rules for determining product origin, lest goods be shipped to an exempt country and then re-exported (trans-shipped) in order to skirt coverage. This determination may be complex, depending on the product in question.

At the simple end of the spectrum are products which are "wholly obtained" in a particular country. This might include products such as steel where production is unlikely to occur in more than one country. No new rules would need to be developed to deal with these products.

Products that have been produced across more than one country will be much more difficult to deal with. For these kinds of products, origin determination is normally based around the idea of last "substantial transformation", although a range of different and detailed rules are used in practice.

In practice, rules of origin are based on one of three criteria:

1. Changes to the essential character of a product, often measured by the shift of a product from one tariff classification to another.
2. Value added rules, where a minimum level of value must be added in a country before that country can be conferred origin.
3. Technical processes, where a specific manufacturing process or addition of product component is defined as either conferring or not conferring origin.

It is not clear which of these criteria would work best for BCA. In principle, to guard against leakage there may need to be a new "emissions added" criteria, which confers origin on the basis of where the majority of emissions were created during the production of a product. This would, however, impose new and potentially significant transaction costs on traders who will have little experience tracking embodied emissions through supply chains. Moreover, existing evidence on the take up of trade preferences suggests that large numbers of traders would choose to face a BCA rather than bear the cost of proving origin.

that the cap is *effective*; there are many formulations of emissions caps—for example with offsets, price collars, intensity caps, etc.—that would in fact allow for leakage. As with the previous national-level exemption, this exemption would require strong trans-shipment provisions, somewhat increasing administrative complexity. Because it is a national-level exemption, this exemption creates problems with GATT's Article I obligation for most-favoured-nation treatment, but it might be justified under GATT's Article XX which allows states to take otherwise-illegal measures that are aimed, among other things, at genuinely protecting the environment. This is because there is such a strong relationship between the defining national characteristic (an emissions cap) and the environmental objective (preventing leakage).

30. *Exempting countries that take "adequate" national actions, other than national caps*. Anything other than a cap is susceptible to leakage. This exemption is administratively

Comment [AJC1]: Why so? What if the action involved shutting down production of all polluting sectors?

Is it more that we just lack the information about the effectiveness of non-price-based policies and want to avoid type II errors, as per JS?

difficult and potentially lacks predictability, because of the challenge of defining *ex ante* what constitutes adequate action. For example, how high would a carbon tax have to be, and what coverage would be needed, in order to qualify? Defining an "adequate" cap and trade scheme would be even more challenging, given the myriad permutations of such schemes. Ideally the exemption would not be a pass/fail threshold, but would give partial credit for actions that are significant but less than "adequate". But this ideal would be so complex as to be unworkable.

31. A strong advantage to this exemption is the ability to use it to bring the BCA regime into greater coherence with the principle of CBDR-RC (and the trade law equivalent: special and differential treatment (S&DT)). This would involve either or both of: defining adequacy as less than the level of effort expended in the implementing country, or; adopting a flexible approach that accounts for policies not explicitly labelled climate change policies (e.g., energy taxes and industrial efficiency efforts that reduce GHG emissions).[5] The latter would also help in terms of coherence with trade law, which frowns on specifying the policy tool to be used and prefers specification of the outcome. This exemption would create problems with GATT's MFN provisions, since it distinguishes at the national level, but if properly designed it might be saved by GATT's Article XX exceptions. This exemption would require strong trans-shipment provisions.

32. *Exempting countries that implement a sectoral cap.* If a country caps the emissions from a given sector, this assures that no leakage will take place with respect to that sector. As with a national-level cap, the assumption is that the cap is effective. If the exporting country takes actions that are *equivalent* to a sectoral cap, such as taxes on the exports from that sector, counting such actions adds a level of administrative complexity since equivalence would have to be calculated. But provided this calculation could be done, leakage is still addressed (unlike the case for measures equivalent to a *national* cap). This exemption, like the national-level exemptions, would need to be accompanied by strong provisions on trans-shipment, in this case just covering the sector in question. There is no trade law problem with non-discrimination here, since the discrimination is based on sectoral characteristics, rather than on country characteristics.[6]

Comment [AJC2]: Why is there any difference?

33. *Exempting LDCs and LICs.* An exemption for LDCs and LICs would help bring the measure into policy coherence with the UNFCCC principle of CBDR-RC, the WTO principle of special

[5] Under such a regime even non-climate-related policies (such as energy security) would count when the home country determines adequacy of effort. There are pros and cons to such a procedure. On the pro side, such policies have major climate benefits. As well, it is impossible in practice to demonstrate the intent of a policy – countries could simply rename their policies to make them appear to be climate-motivated. On the other side of the argument, it is extremely difficult to compare costs across different sorts of policy tools. It would be much simpler to only consider carbon taxes or ETS as schemes that count in cost comparisons, or that count in determining adequacy of effort.

[6] To be clear – as with all permutations of BCA there could still be a trade law complaint of discrimination between *like goods*, based on the argument that high-carbon and low-carbon goods are *like* in trade law terms. But compared to country-based discrimination this type arguably stands a better chance of passing Article XX's strictures to be found an acceptable environmental measure.

and differential treatment, and with other international commitments on development such as the Millennium Development Goals. It is not clear, however, that such an exemption would have much palpable impact, since almost none of these countries export the type of goods that are targeted by BCA (see Box 5). Moreover, this exemption being a national-level exemption, it creates problems with GATT's Article I obligation for most-favoured-nation treatment, which requires that no nation be favoured above any other in the treatment of goods. It might be carved out by the WTO's Enabling Clause, which exempts some forms of special developing country tariff treatment from MFN obligations, but that is unlikely. The Enabling Clause applies to discriminatory trade measures that have as their objective development in the target countries—a tough bar to clear for any BCA regime. Moreover, it specifically does *not* cover those measures that "raise barriers to or create undue difficulties for the trade of any other [i.e., non-exempted] contracting parties."[7] This sort of exemption would need to be accompanied by trans-shipment provisions.

34. *Exempting goods/sectors with minimal levels of imports*. By definition such a *de minimus* clause would have minimal impact on global GHG emissions. This exemption would be founded on the proposition that at some level the embedded GHGs in a product do not justify the cost of tracking and internalization. Such an exemption would have payoffs in terms of feasibility: it would make the scheme administratively simpler and more cost effective.

35. *Exempting goods by means of administrative flexibility*. This would involve the ability of the implementing government at some level to decide to exempt certain countries, or products from certain countries, from coverage, presumably as a result of considering broader public policy objectives. The larger the volumes of trade exempted, and the more intense the GHG production implicated, the greater the impact. The reverse side of this coin is that a smaller scope of coverage is administratively simpler. Because it would have to focus on the national level this exemption would face problems of conflict with the GATT's MFN provisions, and would need to be accompanied by strong trans-shipment provisions. This exemption lacks the predictability that should be the hallmark of any scheme.

36. Given the forgoing analysis, we recommend the following exemptions be featured as part of a BCA regime:

    - Exemptions for countries with an effective national emissions cap (with trans-shipment provisions);
    - Exemptions for countries taking adequate national actions other than caps, where adequacy is defined to achieve coherence with CBDR and trade law (with trans-shipment provisions);
    - Exemptions for sectors covered by an effective sectoral cap, or by some equivalent measures such as export taxes (with sectoral trans-shipment provisions);

[7] "Differential and more favourable treatment reciprocity and fuller participation of developing countries," (The Enabling Clause). Decision of the GATT Contracting Parties of November 28, 1979 (L/4903), para. 3(a).

- Exemptions for LDCs and LICs *if it could be assured that this would be carved out by the WTO's Enabling Clause;*
- Exemptions for sectors or goods that fall below a *de minimus* level of imports.

37. The existence of effective trans-shipment provisions is an important prerequisite for the first three of the recommended exemptions. Without them, any national or sectoral-level exemptions will be circumvented. Box 4 describes such provisions, and makes it clear that they are most feasible and effective when the goods in question are wholly obtained in a single country, or at least have a very simple supply chain. This creates a significant link to the following section, as it argues for a high threshold for coverage of goods/sectors, which would in effect include little more than the small handful of energy-intensive trade exposed goods discussed in Box 5. Most of these have relatively simple supply chains.

Identifying goods/sectors to be covered

38. A second part of determining the scope of a BCA regime is determining what products or sectors in the implementing country should be covered by the scheme. Primarily this involves determining which products or sectors are actually at risk of leakage. As a general proposition, if we are interested in preventing leakage we should prefer to make type I errors (covering those goods and sectors that are not really vulnerable) than type II errors (missing coverage for goods and sectors that are in fact vulnerable), which would argue for broad coverage.

39. There are, however, also a number of arguments for narrower coverage. For one thing, applying BCA to sectors with low vulnerability will yield limited benefits relative to the administrative costs involved. In the same vein, even if only the high-emitting highly traded sectors are covered (there are relatively few of them), the regime will deliver almost all its potential benefits.[8] As well, it was noted above that an over-broad coverage will make it difficult to protect against gaming of the regime through trans-shipment, as it will begin to include manufactured goods and other goods that have long and complex supply chains. Over-broad coverage also skirts with trade law violations, as it constitutes support for domestic firms and sectors beyond what can be justified by environmental objectives. Finally, as noted below, any regime is likely to be applied imperfectly, pragmatically, probably leaving room for errors and deliberate manipulation. Balancing these arguments against the general desire for over-broad coverage leads to some optimal point which, in our view, is at the narrow end of the spectrum.

40. While the ideal determination of sectoral vulnerability would be a complex process of determining reliable estimates of such things as the responsiveness of net exports and the rates of cost pass-through, in the final event any workable regime would need to use a

[8] Reference

system that is simple enough to be operational and transparent, based on reasonably available data.[9]

41. BCA should only be used to protect sectors or products that are regulated with a price-based climate policy such as a carbon tax or cap and trade. These policies offer a clear carbon price on which to base the adjustments. Non-price policies should not be covered for two reasons. One, while they may raise costs and influence competitiveness, it is impossible to calculate in a transparent fashion the costs associated with the policy. Nor would it make sense to allow more inefficient climate policies (which impose higher costs) to have larger adjustments. Second, and more importantly, non-price policies do not require that regulated sectors pay for the remaining embodied carbon in their products, which is what BCAs are designed to adjust for.

Comment [AJC3]: But they can impose significant costs. They could impose costs equal to or higher than those imposed by a price-based policy. Isn't there a legitimate basis for protection in the case of such costs?

42. There are two criteria for this determination, and both should be used simultaneously to avoid over-broad sectoral coverage:[10]

    - The first criterion should establish that the cost of GHG regulations would result in substantially higher production costs for the sector in question. Such costs should be calculated as the tonnes of GHG emitted by the sector, multiplied by the projected emissions tax or allowance price. These costs should then be evaluated relative to the economic size of the sector, as measured by the total value of shipments, or value added. This ratio reflects the GHG-intensity of production (or of value added). The emissions data should be available, as the enforcement of the GHG regulations will rely on it.

      Some proposals instead use energy-intensity of production as an indicator for high regulatory costs. But this metric is less reflective of the true cost impacts of GHG regulation. For one thing, not all energy production carries equal climate impacts. As well, process emissions and all non-energy sources of emissions are excluded from the calculation. In some sectors (e.g., agriculture, waste management) the latter are more significant than energy-related emissions.

    - The second criterion should establish that any attempt to pass those increased costs along to consumers would result in significant shifts of consumption to foreign sources. Note that a drop in consumption or profits is not in itself indicative of leakage; it may rather indicate that consumers are changing their behaviour by consuming less or by using cleaner substitutes, both of which are desirable ends. However, if consumption is merely *displaced*, rather than *reduced*, leakage is occurring. The ideal indicator for this criterion would be trade sensitivity – the degree to which cost increases would lead to a substitution to products sourced from abroad. Unfortunately, reliable metrics for trade

[9] Any parallel attempts to craft sectoral approaches to dealing with leakage concerns should be mined for the valuable information and data they could provide.

[10] These are the criteria chosen for use in the US Waxman-Markey bill as a basis for rebates, and for use in the EU's ETS as a basis for issuing free allowances. In the case of the Waxman-Markey bill they would also be the basis for coverage under the BCA regime. They are, however, not the only criteria that could be used.

sensitivity are not generally available.[11] A reasonably simple, albeit imperfect, proxy is trade exposure, measured as the value of imports and exports in the sector relative to total production plus imports.[12]

[11] These would rely on estimates of elasticities of substitution between domestic and foreign products.
[12] The actual formula used to calculate trade exposure is (M+X)/(Q+M), where M=imports, X=exports and Q=production.

4. *Determining the level and type of adjustment*

43. Any BCA regime will need to elaborate how it calculates the adjustment it will assess on the covered products. This involves first determining (or estimating) the amount of embodied carbon in a given product. It then involves calculating the level of adjustment, applying any necessary exemptions and deciding what form of adjustment will be used.

Assessing the carbon content

44. The objective is to calculate an accurate carbon footprint for imported covered products. Meeting this objective becomes more difficult if the product can be manufactured using more than one process (with widely different emissions profiles), if the manufacturing process simultaneously manufactures multiple products (it's difficult to attribute emissions across several products) or if the inputs into the process are many and are themselves produced using a complex process.

45. Assessing carbon content involves setting system boundaries, determining the sort of benchmarks to be used in place of actual emissions data where necessary, and using accurate data reported to agreed protocols. Each of these steps is examined in greater depth below.

The system boundary

46. The system boundary—the delineation that determines what is in and what is out of the calculation of a product's carbon footprint—can be set to cover any or all of: the inputs into the production process; credit for by-products such as blast furnace slag (a clinker substitute in the cement sector, produced by the steel sector); transport of final products to market; consumption of the product; and its final disposal.

47. The direct emissions from a production process (scope 1 emissions – emissions from sources that are owned or controlled by the producer[13]) should always be included within the system boundary. The decision to further hold the exporter responsible for emissions associated with inputs into the production process and downstream transport, consumption and disposal of the product depends predominantly on: how significant the inclusion of the GHG emissions would be; whether GHG emissions are already accounted for within another sector; and the practicality of collecting data which is sufficiently robust.

48. Indirect emissions—those emissions that are a result of production but occur at sources not owned by the producer—can be usefully divided into energy-related emissions (scope 2 – off-site generated electricity, heat or steam) and other indirect emissions (scope 3 – e.g., from transport of inputs).

[13] The definitions of scope 1, 2 and 3 emissions used in this section are taken directly from the GHG Protocol.

49. The question of how to treat scope 2 emissions is a key consideration for many products. There are a number of arguments for including them in the system boundary. For one thing, such emissions can represent the majority of emissions from processes such as the smelting of metals (e.g. aluminum, copper, titanium), and can represent a material share of total GHG emissions from sectors such as steel and cement. As well, such industrial energy-related emissions are a significant portion of many national emission inventories, and as such they should probably be covered by any national climate policy. Where they are so covered, any BCA regime would also need to cover them. Otherwise energy-intensive firms relying on off-site generation would be subject to the same regulatory costs as those generating on site, or those with high process (non-energy-related) emissions, but would not receive the same shelter from international competition. Aside from the basic inequity of such an arrangement, the risk of leakage is obvious. Finally, non-inclusion for scope 2 emissions creates incentives for on-site generation of electricity, heat and steam which, depending on the circumstances, may be less efficient (i.e., more emissions-intensive) than off-site generation.

50. As such, we recommend that emissions from electricity, heat and steam generated externally (scope 2 emissions) should be included within the system boundary, unless it can be shown that the incentives their non-inclusion creates would not be detrimental. The EU Commission's benchmarks developed for Phase 3 of its Emission Trading System (EU ETS) include emissions from both electricity and heat generated externally.[14]

51. Where by-products are in the form of energy that is exported outside the plant's boundaries (for example electricity exports, the export of waste heat, the export of blast furnace gas), GHG emissions should be credited to the production process, using the same methodologies as for the import of such products. We do not recommend that crediting for non-energy by-products is included. There is a risk of double counting of GHG emission reductions and the downstream users do not tend to accept that they should be responsible for the GHG emissions embodied in the by-products they purchase.

52. Scope 3 emissions are other (non-energy-related) indirect emissions from, for example, the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, outsourced activities, waste disposal, etc. We recommend that these not be included in the system boundaries, since the calculations would be complex, covering many types of activities for which no data or benchmarks exist. Moreover, scope 3 does not tend to be a significant source of emissions relative to total emissions.

53. The reasoning is similar for emissions from the transport of products to market; these are indirect emissions not covered by scope 2 or 3 which would ideally be within the system boundary. There are, however, major challenges in identifying which route a specific product has taken and ascribing to that product the transport-related emissions. Given that complexity, and the fact that GHG emissions from transport tend to be low relative to the

[14] Again, add a reference?

emissions from the energy-intensive production processes potentially covered by a BCA, we do not recommend that GHG emissions from transport to market be included.

54. Expanding the system boundary to include GHG emissions from the consumption and disposal of products would represent a major departure from current GHG accounting practice. There is no consensus on the extent to which responsibility to reduce these emissions should lie with their manufacturers. Moreover, there are significant uncertainties in defining the appropriate boundaries, and results from applying life-cycle assessment techniques are considered uncertain and controversial. We do not recommend that GHG emissions from the consumption and disposal of products be included within the system boundary.

The benchmarks

55. If exporters are unable or unwilling to provide third-party verified data to a protocol or standard specified by the importing jurisdiction, or if the production process is the end result of a complex value chain including suppliers from many countries, [15] benchmarks should be used. Benchmarks should aim to capture carbon content as accurately as reasonably possible. They should be set in good faith and should not be punitive. In that spirit, whatever system boundaries are applied to domestic producers should also be applied to foreign producers in the setting of the benchmarks.

56. Multiple benchmarks might be needed where there are multiple production processes for a single product. [16] For example steel can be made from iron ore using a process starting with a blast furnace, or from scrap steel using an electric arc furnace. The two have vastly different GHG intensity profiles, meaning they may need different benchmarks. As a general proposition a single benchmark for any given product is preferred; multiple benchmarks provide no incentives to encourage switching to the cleaner of the various available technologies. In many cases, however, they might be necessary. In steel, for example, the use of the cleaner technology is limited by scarce supplies of the input – scrap steel – and thus different technology benchmarks are needed.[17] Significantly different technologies also exist in other sectors of interest: cement, and various chemicals, for example.

57. Different types of emissions might call for different benchmarks. Scope 1 emissions, for example, might be amenable to an international standard – one applied equally regardless of the country of production – since non-energy emissions are not particularly dependent on country-specific factors. Energy-related emissions from outside the plant boundary (scope 2), on the other hand, will vary considerably depending on country-specific factors

[15] Fortunately, as noted above, cost effectiveness considerations would very likely exclude manufactured products from coverage.
[16] The EU ETS Phase 3 benchmarks follow this methodology. They were able to set benchmarks for x processes from y sectors [complete this reference]
[17] This case underscores the need to understand the technical and financial dynamics of the covered sectors in some detail in order to properly set benchmarks.

such as the national energy mix, and so country- or region-specific GHG emission benchmarks should probably be applied.

58. There are a number of options for policy makers to choose from in setting benchmarks. Four main variants are examined below, again using the criteria we enunciated at the outset.

Table 2: Benchmarks

Benchmarks	Global envl effectiveness	Feasibility	Policy coherence	Good governance
Avg emissions intensity in exporting country	no incentives for worse-than-average performers to improve	requires data from foreign jurisdictions that might not be available or verifiable	conflicts with GATT MFN, possibly saved by GATT Art. XX	
Avg emissions intensity in importing country	low incentives for improvement; low protection against leakage	simple scheme		
Emissions intensity from best available technology	very low incentives for improvement; very low protection against leakage	simple scheme, unlikely to raise challenges		
Emissions intensity from worst practice in importing or exporting country	high protection against leakage	if based on exporting country, requires data that might not be available or verifiable	quasi-punitive, and counter to spirit of S&DT, CBDR&RC; if based on exporting country, conflicts with GATT MFN	

59. *Average emission intensity in the exporting country.* This benchmark would be somewhat effective at preventing leakage. Using an average has the disadvantage that any producers with above-average GHG intensities are assessed at the average level, meaning there are no incentives for those poor performers to improve to the average level and little to prevent them from gaining market share via lower costs. As well, there is no reward or incentive for performing better than average. Using exporting country data as a basis could be problematic where such data are not readily available or verifiable, and gathering such data across a variety of exporting countries would be arduous. Discriminating by country conflicts with GATT's MFN provisions, though there is a chance that this sort of benchmark might be saved by GATT's Article XX exceptions, since it can be argued to be environmentally based and non-arbitrary, and since like all benchmarks discussed here it is only used when individual producers fail to provide firm-specific data. This benchmark would need to be accompanied by provisions to prevent trans-shipping from countries assigned higher intensity benchmarks (see Box 4).

60. *Average emission intensity in the importing country.* This benchmark would be less effective at preventing leakage, assuming the importing country producers were relatively "clean"; the lower the assumed emissions intensity of the benchmark, the less actual adjustment it

forces, and therefore the less effect it has on GHG-intensive producers. It is a straightforward scheme with relatively simply calculated benchmarks, and because all importers face the same benchmark it has no MFN issues.

61. *Emissions intensity from best available technology (BAT).*[18] As the benchmark with the lowest assumed GHG intensity, this is also the least effective at preventing leakage or offering incentives for improvement. It is also a straightforward scheme, and perhaps the least likely to be successfully challenged under WTO law, because of its low level impacts and its non-discrimination (i.e., a single benchmark for all countries).

62. *Emissions intensity from worst practice.* This benchmark probably represents the most effective option for preventing leakage, due to its high assumed GHG intensity. If it is based on exporting country practice, it presents the challenge of needing data from many jurisdictions, some of which might not be available or verifiable. An exporting country benchmark would also need to be accompanied by trans-shipment provisions (see Box 4), and would be in conflict with GATT MFN obligations. If it is based on importing country practice, it would presumably be somewhat less effective at preventing leakage. The high level of charges implied by this benchmark could be argued to be counter to the spirit of CBDR-RC and S&DT. While it could be countered that those charges would only apply to those that did not furnish their own verified data, the process of supplying that data is a costly one as noted above, and would be particularly difficult for small and medium-sized enterprises to bear. This benchmark errs on the side of caution, over-assessing many covered firms. This runs counter to the objectives of the benchmark, and potentially causes trade law issues. The problem is partially ameliorated by the option to submit individual firm data.

63. In light of this analysis, we recommend that benchmarking be conducted as follows, understanding that all regime options offer trade-offs between various objectives, and none satisfies all criteria:

    - In the first instance, producers should be given the option to provide third-party verified firm-level data on emission intensity, using the same system boundaries used for domestic producers. Only when that is not forthcoming should benchmarks be used as a fallback. This attention to individual producer circumstances has the advantage that it increases the odds that any scheme will be found WTO legal, and it provides incentives to producers to improve their processes.
    - The benchmarks developed should be product-specific, and also where necessary specific to different production processes. In principle, it is preferable to have fewer benchmarks for any given product, but where a product has significantly different

[18] It should be noted that the EU ETS's Phase 3 benchmarks, which are set at the level of the average of the 10% best EU producers, are designed only as a method for allocating free allowances, and were not designed to be applied to importers under a BCA or other scheme.

technologies in use (in terms of GHG intensity, abatement options), more than one benchmark will be needed.

- For scope 1 emissions (direct emissions), the benchmarks should use worst-practice emissions intensity in the importing country. This is in our opinion the best compromise among the competing imperatives of the various judging criteria we applied; it offers strong protection against leakage, but because it is only employed where firms have declined to report actual emission data it is not punitive, and offers incentives for good practice.
- To counter the negative impact of such a GHG-intense benchmark we strongly recommend that implementing states offer support, in the form of financial and technical assistance in accounting, reporting and verification, to assist foreign covered exporters in submitting verified individual data.
- For scope 2 emissions (energy, steam and heat generated off site) the benchmarks should use average data from the exporting countries. Fairness dictates that producers who use on-site-generation, who would otherwise have to use importing country worst practice as a benchmark, should have the option to calculate their energy-related emissions using the same exporting country average benchmark used for scope 2 emissions.

The data

64. The data submitted by producers should be measured and reported to a specified protocol and verified by a third party. Using international standards and protocols where available, both for submission of firm data and for the creation of benchmarks, would help to ensure compatibility with WTO rules and may help reduce administrative burdens. There are a number of protocols which can be used, for example the WBCSD/WRI GHG Protocol[19]; ISO Standards including 14064 and 14065; the British Standard Institute (BSI) PAS2050; and methodologies used within the UNFCCC Clean Development Mechanism to account for GHG emission reductions from changes in electricity generation technologies and reduced electricity consumption.[20]

Modifications to the adjustment level

65. Levels of exporter country carbon pricing should be credited. This might include export tax policies, provided they were explicitly carbon-related.

[19] The WBCSD/WRI GHG Protocol is detailed at: http://www.ghgprotocol.org/. Specific cement and steel sector initiatives have been developed over the past few years by: the Cement Sustainability Initiative (see "Getting the Numbers Right" (GNR), at: http://www.wbcsdcement.org/index.php?option=com_content&task=view&id=57&Itemid=118); the World Steel Association (see http://www.worldsteel.org/climatechange/?page=2&subpage=2).

[20] Reference these methodologies

66. Any free allowances or other compensatory mechanisms to shelter domestic firms need to be taken into account when calculating the amount of adjustment due. Depending on the regime, this might conceivably mean that the level of BCA is adjusted down to zero.[21]

67. Special benchmarks could be developed for less developed countries (if they are not exempt), to respect the principle of CBDR-RC. The importing country could assume, for example, that all imports from LDCs have used best available technology. This exemption would have to be accompanied by trans-shipment provisions.

Type of adjustment

68. Adjustments need not be in the form of levies. An alternative, for example, would be to allow importers or foreign producers to purchase international carbon offsets up to the determined value of adjustment.

[21] It is worth noting that compensatory mechanisms could even constitute a subsidy which would *in theory* mean that the adjustment should be negative. It would, of course, be rather idealistic to recommend that this possibility should be recognized in BCA regimes, but it is worth noting nonetheless.

5. *The application of BCA to exports*

69. Border adjustment for exports would relieve exports from the regulating countries of the burden of the carbon payments associated with their production. This policy is integral to implementing true destination-based carbon pricing, if that is the goal. We noted above the analogy to the current prevalence of destination-based taxation under national VAT schemes. Adjustment for exports would avoid the equivalent of double taxation where the products were being shipped to a destination state that also applied BCA to its imports.

70. Export adjustment also helps avoid leakage from loss of market share in foreign markets, making exports from regulating countries less disadvantaged in those markets relative to products from non-regulating countries. Without this adjustment any adjustment to imports covers only a part of the leakage picture.

71. If export adjustments are used they should be designed carefully, so as to preserve the domestic carbon pricing incentives for reducing emissions intensity. Rather than exempting exported goods, a rebate could be offered for exported products in proportion to a metric of their embodied carbon. That metric would need to be based on sector-wide, rather than firm-specific, calculations, so that firms do not expect larger emissions to generate larger rebates. As with import adjustments, a best-available technology metric avoids the possibility of over-adjustment, but has weaker effects on competitiveness and leakage than an average emissions metric.

72. To date, policymakers have preferred to focus on adjustment for imports only. One of the most important reasons for this is probably the unclear legal status of BCA for exports under WTO law. At the end of the day a wide range of legal scholars agree that it is not clear whether such adjustment would constitute a prohibited subsidy under the WTO's Agreement on Subsidies and Countervailing Measures.[22] But there does seem to be a "gentlemen's agreement" within the WTO not to rebate taxes levied on inputs that are consumed in the production process.[23]

73. Border adjustment for exports is difficult to reconcile with an approach, like the one recommended in this text, that advocates exemptions from import adjustment. To illustrate: we believe that BCA should not be applied to the exports of, for example, countries with national emissions caps, because there is no risk of leakage to such countries. Clearly any rebates to our exports to such countries would constitute unfair subsidies that, if the destination country were not practicing BCA, would induce leakage to our own jurisdiction. Any justification for national exemptions on the import side is also a justification for not adjusting on the export side.

74. The problem is that it is impossible to create country-level exemptions on the export side. Any such exempted goods could easily be trans-shipped from the destination country to

[22] Reference to legal literature
[23] reference

other countries that do not qualify for an exemption. There is no feasible way to avoid such an outcome. As such, while export adjustment seems compatible with an approach that has no national exemptions, and which relies on other countries also practicing BCA (analogous to the world's VAT regimes), it does not mesh well with an approach that has national exemptions, where countries have varied and uncoordinated climate policies.

75. Given this fundamental problem and the potential clash with trade law, we do not recommend the use of export adjustment in BCA regimes.

6. Use of revenues from import adjustments

76. There are a number of options for the use of the revenues collected by means of adjustment applied to imports. They include:

    - Direct the collected funds to general revenues in the collecting country;
    - Refund any adjustments collected to the exporting country, either directly or to subsidize clean technology transfer;
    - Contribute adjustments collected to internationally administered funds for climate change mitigation and/or adaptation;
    - Designate funds collected to be disbursed by the collecting state in ways that benefit developing countries (e.g., finance for mitigation and adaptation projects).

77. We recommend against the first option, though we recognize that any use of this revenue will have to take place within the context of domestic fiscal realities, and some jurisdictions discourage or prohibit hypothecation of tax revenues to specific purposes. Ensuring that the revenues are not retained by the levying country removes incentives to use BCA to enhance domestic welfare by manipulating the terms of the adjustment.

78. The remaining three options move the regime as a whole toward better respect for the principles of CBDR-RC and S&DT. As well, while it is impossible to say *ex ante* how a BCA regime would fare if taken to WTO dispute settlement, any of these three options would likely improve its chances of success in that context, since they would help demonstrate that the BCA regime was in fact aimed at achieving environmental objectives.

79. For such measures to be meaningful, it would be important to ensure that the earmarked contributions be additional to those already required by international agreements, or pledged under existing programs of support. That is, they should not simply replace funds from existing commitments.

7. *Other design guidance*

80. Best practice in institutions and governance for BCA can be drawn from a rich tradition of norms and principles found in trade and administrative law, industry practice and economics.

Pre-establishment guidance

81. Trading partners should be notified of BCA proposals at an early stage (when amendments can still be introduced and comments taken into account), with draft text distributed to them on request. There should be opportunity for exporting countries and firms to present their comments in writing. These should be discussed upon request, and the written comments and the results of these discussions should be taken into account in the final regime design.

82. Entry into force of any BCA regime should give exporters and exporting country governments enough lead time to adjust their policies and practices.

Operational guidance

83. An official point of contact should be designated to respond to questions and requests for documents from exporting countries and firms.

84. The decision-making process should be predictable and transparent, with methodologies for determining vulnerable sectors, level of adjustment and country-level applicability, for example, being public information.

85. Calculations with respect to individual countries and exporters—for example, default emissions intensity baselines—should be regularly reviewed and revised where necessary. The parameters of the regime should also be regularly reviewed – at least on an annual basis. Exporting countries and firms should be able to make submissions to the review processes.

86. There should also regular review of BCA regimes aimed at assessing their effectiveness in meeting their stated objectives.

87. There should be mechanisms within the BCA regime whereby exporting countries and firms can appeal decisions and calculations that concern them.

Sunset guidance

88. The measures should be time limited and should have clear conditions for phase-out. BCA should only be intended to offer temporary effect during a period of transition to a low-carbon economy and broader international cooperation. At a minimum, the continued application of BCA should be contingent on explicit criteria related to the state of progress

in achieving a low-carbon economy, and in achieving international cooperation on climate change action.

Annex I: Composition of the drafting group

James Bradbury, World Resources Institute, USA

Aaron Cosbey, International Institute for Sustainable Development, Canada

Susanne Droege, German Institute for International and Security Affairs, Germany

Carolyn Fischer, Resources for the Future, USA

Dave Sawyer, International Institute for Sustainable Development, Canada

Julia Reinaud, Institute for Industrial Productivity, France

John Stephenson,

Lutz Weischer, World Resources Institute, USA

Jake Werksman, World Resources Institute, USA

Peter Wooders, International Institute for Sustainable Development, Switzerland

From: Jaffe, Judson
To: Hall, Daniel
Subject: (b)(5) [redacted]
Date: Thursday, February 02, 2012 3:59:00 PM
Attachments: (b) (5) [redacted]

Gotta go. I got through it but haven't had a chance to look back to fine tune edits. Let's talk tomorrow morning.

From: Hall, Daniel
To: Jaffe, Judson
Subject: RE: coal plant memo: long version
Date: Wednesday, February 01, 2012 5:46:52 PM
Attachments: (b) (5) [redacted].

From: Hall, Daniel
Sent: Wednesday, February 01, 2012 3:26 PM
To: Jaffe, Judson
Subject: coal plant memo: long version

Here's the long version. I'm now going to work on a bulleted version, so the key there here is to evaluate whether the ideas covered are the right ones, whether there are additional arguments we should be making, etc.

(b) (5) [redacted]

(b)(5) [redacted]

Daniel Hall
Office of Environment and Energy
U.S. Department of the Treasury
Phone: (202) 622-7801
Fax: (202) 622-6728
Email: daniel.hall@treasury.gov

From:	Jaffe, Judson
To:	Metcalf, Gilbert; (b)(6) @mit.edu"
Subject:	RE: Fwd: question
Date:	Sunday, August 12, 2012 9:59:00 PM
Attachments:	x-23-12[1].pdf 5-15-waxmanletter[1].pdf

John,

On the level of the offset, you might be interested in the updated JCT numbers, which CBO apparently adopted too (attached as "x-23...pdf" and at: https://www.jct.gov/publications.html?func=showdown&id=4406). As you'll see, the numbers increase over time from 24.4% in 2012 to 29.8% in 2022, reflecting the scheduled increase in statutory tax rates if there are no new laws.

I've also attached a letter that CBO sent to Waxman's staff in 2009 on the scoring of cap-and-trade in case it has helpful additional detail beyond the CBO report that you sent Gib.

Regarding the fact that your estimates of the offset exceed 25%, I think a big piece of what you're picking up is that your model presumably captures BOTH changes in taxable income holding constant economic activity (which is the focus of the CBO/JCT offset), AND also the overall change in economic activity associated with higher tax rates. As you may be familiar with, capturing the latter effect is referred to as "dynamic scoring" in budget scoring lingo. CBO and JCT explicitly do not use dynamic scoring--there has been a long-standing debate about this though. The CBO/JCT offset only captures the former effect. Reference to dynamic scoring can be found at page 3 of the CBO report that you sent Gib. Consistent with your finding, CBO states that "those macroeconomic 'dynamic' effects would go in the same direction as the offset." (i.e., they would have gotten a higher offset estimate too if they factored in these effects)

Regarding the instances where CBO doesn't apply the offset (or applies the "offsetting offset"), I think it's easiest to describe those circumstances as ones where allowance value is recycled in a way that makes that value taxable, rather than nontaxable, income. For example, imagine a cap-and-trade program's effect on taxable income from a coal-fired power plant. For this example, assume the plant is sufficiently efficient that its generation output is unchanged by the cap-and-trade policy.

- If allowances are auctioned, the coal plant's taxable income will decline by the value of allowances that it has to acquire at auction (i.e., by the amount that its expense go up). Corporate tax receipts from that plant will decline accordingly (i.e., there should be an offset).

- If the allowances are instead freely allocated to that coal plant (and others), that coal plant's taxable income will be unchanged relative to the no-policy baseline (in fact, its taxable income may rise due to higher electricity prices, but let's put that aside). As a result, in this allocation scenario, corporate tax receipts from that coal plant are unchanged relative to the no-policy baseline (i.e., there should be no offset, or an "offsetting offset" should be applied).

- Finally, if allowances are auctioned and auction receipts are used to lower corporate tax rates, the coal plant's taxable income would still decline by the value of the allowances it had to acquire at auction (i.e., there should be an offset). The fact that the auction receipts are then used to reduce corporate income tax rates does not undo the cap-and-trade program's effect on the coal plant's taxable income (i.e., there should still be an offset). Instead, this use of the auction receipts just leads to application of a lower tax rate on the remaining taxable income. As this last example shows, if receipts from the new policy you are modeling are recycled through lower tax rates there should still be a need for the offset, and I believe CBO/JCT would score this accordingly.

If the difference between your endogenous offset estimate and the CBO/JCT offset is not substantial, I would be inclined to just leave it and note that you're picking up dynamic effects in addition to the standard effects that CBO/JCT capture in their offset. Alternatively, perhaps you could see how different your estimates are relative to the CBO/JCT offset, and simply relax your constraint on government receipts to match that.

Jud

-----Original Message-----
From: Metcalf, Gilbert
Sent: Saturday, August 11, 2012 8:07 AM
To: Jaffe, Judson; (b)(6) @mit.edu'
Subject: Fw: Fwd: question

John,
There are two issues: how much other revenues decline and how to score for budget neutrality purposes. Your model can measure the first but you need to follow the scoring rules for determining the amount of revenue you can offset with carbon tax. So it seems to me that you would use the 25 percent haircut for the latter.

On haircut treatment, I understand CBO made very subtle distinctions in the cap and trade context depending on allowance treatment. But a carbon tax is an excise tax and I am not sure that those distinctions persist in the tax context. I am copying Jud Jaffe in my office in hopes he may have more info on this. Jud: you might want to check with Curtis as well.
Gib
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: John M Reilly (b)(6) @MIT.EDU]
Sent: Thursday, August 09, 2012 01:31 PM
To: Metcalf, Gilbert
Subject: Fwd: question

Gib,

i think we discussed idea that we would try to look at the issue of using a carbon tax as part of solving budget problems. Do you have any thoughts on what would be useful for re: revenue neutrality. We can impose absolute revenue neutrality but we tend to require more than the 25% standard that the budget counters at CBO/JCT would require. And then in talking with Waxman's staff they indicated that in some cases there is no haircut for revenue neutrality. Correspondence with CBO below and report Terry mentions confirms that in some cases--e.g. if allowances given away for free they would apply no haircut believing this would not affect tax revenue. I have a hard time following the logic they use....but if CBO or JCT would actually apply no haircut, if the revenue is being returned via tax cuts, does it make more sense to simulate that case? Or assuming the 25% rather than our endogenous calculation?

(Not sure how this will come out in the end, but we had a couple of sets of runs that needed adjustment. In the first set, emissions baseline was too high, but the economic results were that the tax reduced emissions but caused a net loss in welfare--no strong double dividend by using revenue to cut other taxes--but then a relatively large amount of revenue was going to revenue neutrality. Then in a rush before Sebastian left he redid the baseline to get lower emissions-but did so by adjusting labor productivity down--in this set of cases we had strong double dividend effects where substituting the carbon tax for other taxes led to an improvement in welfare. However, the labor productivity adjustment was so large that GDP growth was only .5% per year. Before I noticed that, I shared some results with the Congressional folks but then warned them when I realized what was going on that these might not stick--of course they love the economic benefit of carbon tax. Here I think because economic growth was so slow, tax receipts were growing slowly, and so any impact on taxes was reduced--so a much lower percentage of carbon tax revenue was needed for revenue neutrality. Sebastian is now redoing the runs, trying to get a better baseline--if my diagnosis above is correct then I'm thinking likely back to no strong double dividend, but if we are being excessive with the absolute revenue neutrality, I'd be willing to relax that--relative neutrality?)

Not sure you have time for this but i it is of interest and you have some thoughts I would appreciate it.

John

Begin forwarded message:

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Subject: RE: question
Date: August 9, 2012 12:25:18 PM EDT
To: John M Reilly (b)(6) @mit.edu<(b)(6) @mit.edu>>

Hi John,

It is actually JCT, not CBO, that would score a carbon tax. I can't speak for them (or even for CBO!) but I think the logic that they would apply would be consistent with the logic that CBO would applies when determining whether or not an offset (i.e., the haircut) is, or is not, applicable to a cap-and-trade program. (The purpose of the offset is to reflect the net effect of policy on the budget under the assumption that output remains constant, a standard assumption in scoring bills. For example, holding output constant, a carbon tax or cap-and-trade program would reduce taxable incomes in a manner that would lower revenues collected by other taxes. The main question, then, is whether the carbon tax revenues are used in a manner that would offset that reduction that would otherwise occur, that is whether or not the use of the revenue would "offset the offset"...you can imagine how fun this is to explain to folks!)

The attached document lays out the logic and will hopefully answer your questions. But, as I said, JCT would be the ultimate arbiter.

Hope this is helpful.

Terry

_____
From: John M Reilly (b)(6) @MIT.EDU(b)(6) y@MIT.EDU>]
Sent: Wednesday, August 08, 2012 4:22 PM
To: Terry Dinan
Cc: Rausch Sebastian
Subject: Re: question

Terry,

Now here's a question for you. We are talking to House Energy/Commerce, Waxman folk on their possible interest in a carbon tax as a solution to deficit reduction. I understand they are trying to get CBO to do an analysis of this as well. A question has come up as to how CBO would score the budget impacts, particularly (in your/their lingo) the haircut you would take for revenue neutrality. They discussed a fairly complex set of rulings in the past where depending on what the tax revenue was used for led to different requirements on whether or not their would be a "haircut". They suggested that if they were using carbon tax revenue to reduce other tax rates (personal income, corporate, payroll) from past experience they thought CBO would not apply a haircut, whereas if they were using the money to maintain transfer payments then you probably would require a haircut.

Any thoughts you might share on this? I realize you are likely not in position to commit to exactly what CBO might do, but if there is something we could refer to where CBO has scored differently depending on the use of the revenue, we could at least refer to that as a motivation for using a different haircut rate.

John

On Aug 6, 2012, at 11:36 AM, Terry Dinan wrote:

Thanks Sebastian (and John). I'll take a look at each of these. Terry

From: Rausch Sebastian [(b)(6) @ethz.ch]
Sent: Monday, August 06, 2012 11:11 AM
To: Terry Dinan
Cc: John M Reilly
Subject: Re: Fwd: question

Hi Terry,

You want to look at the following two studies:

Report 185.
Distributional Implications of Alternative U.S. Greenhouse Gas Control Measures Rausch, S., G.E. Metcalf, J.M. Reilly and S. Paltsev, Joint Program Report Series (June 2010)
http://globalchange.mit.edu/research/publications/2065

and

Report 202
Distributional Impacts of Carbon Pricing: A General Equilibrium Approach with Micro-Data for Households<http://globalchange.mit.edu/research/publications/2168>
Rausch, S., G. Metcalf, J. M. Reilly, Joint Program Report Series<http://globalchange.mit.edu/pubs/all-reports.php> (July 2011)
http://globalchange.mit.edu/research/publications/2168

Report 185 looks at GHG control policies closely related to the Waxman-Markey proposal. Report 202 investigates the impacts of a $20 carbon tax. Both studies decompose the impacts of carbon pricing into the uses side of income (i.e., how consumers spend their income) and the sources side of income (i.e., how consumer derive their income) effects.

Our general finding is that sources side of income effects from carbon pricing are progressive because higher-income households derive a larger fraction of their income from capital and labor income as compared to lower-income households (and relative returns to capital fall). In addition, if government transfers (social security, unemployment benefits etc.) are indexed to inflation---which is the case for roughly 95% of government transfer payments to households in the US---lower-income households are insulated from adverse shocks on factor income as they derive a relatively large share of their income from transfers. Therefore, neglecting uses side of income effects, as many traditional analyses have done, overestimates the regressivity of a carbon pricing policy.

Let me know if you have any questions.

Sebastian

Am 03.08.2012 03:57, schrieb John M Reilly:
Can you send on reference to best paper on this. Terry is a great person in us gov.

Sent from my iPhone

Begin forwarded message:

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Date: August 2, 2012 1:39:41 PM MDT
To: "(b) @mit.edu(b)(6) @mit.edu>" (b)(6) @mit.edu<(b)(6) @mit.edu>>
Subject: question

Hi John,

I'm trying to pull together studies that provide information about how a U.S. carbon tax might affect relative returns to capital and labor. I was wondering if you could please tell me which MIT studies I should look at to get your best/most recent insights with respect to this question.

Thanks very much! Hope you are well.

Terry

Terry M. Dinan
Senior Advisor
Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>
(202)226-2927

--

Prof. Dr. Sebastian Rausch

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JOINT COMMITTEE ON TAXATION
March 6, 2012
JCX-23-12

NEW INCOME AND PAYROLL TAX OFFSETS TO CHANGES IN EXCISE TAX REVENUES FOR 2012-2022[1]

Table 1, below, presents the new income and payroll tax offsets that the staff of the Joint Committee on Taxation ("Joint Committee staff") will apply in its economic models of proposed changes in Federal excise taxes during the second session of the 112th Congress. The Joint Committee staff explained the methodology underlying these estimates in a prior publication.[2]

The new offsets are calculated on a calendar year by year basis. The new income and payroll tax offsets will be applied to excise tax estimates instead of the previous 25 percent offset that the Joint Committee staff has historically used. Generally, these offsets will be applied to calendar year excise tax effects and then fiscalized. With this publication the Joint Committee staff plans to start using these offsets exclusively. The calculated offsets include the effects of the extension of the payroll tax reduction through the end of calendar year 2012.[3]

Table 1. Income and Payroll Tax Offsets Under Present Law Baseline 2012 Through 2022

Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Income and Payroll Excise Tax Offsets	0.244	0.269	0.273	0.277	0.284	0.286	0.290	0.292	0.295	0.296	0.298

[1] This document may be cited as follows: Joint Committee on Taxation, *New Income and Payroll Tax Offsets to Changes in Excise Tax Revenues for 2012-2022* (JCX-23-12), March 6, 2012. This document can be found on our website at www.jct.gov.

[2] Joint Committee on Taxation, *The Income and Payroll Tax Offset to Changes in Excise Tax Revenues* (JCX-59-11), December 23, 2011.

[3] At publication legislation related to funding the Highway Trust Fund is before the House of Representatives and the Senate. Development of that legislation has relied upon estimates using the older methodology of a constant 25-percent offset throughout the 2012 - 2022 budget period. The Joint Committee staff will continue to apply the older methodology in analysis of provisions related to Congress's deliberation of this legislation.

The estimated income and payroll excise tax offset for 2012 is indeed very close to the standard offset factor of 25 percent. However, many tax reductions enacted in 2001 and 2003 are set to expire at the end of 2012. With the expiration of these tax cuts, the marginal rates applicable for different factors of production will increase and 25 percent will be an underestimate of the appropriate income and payroll tax offset.

The offsets calculated above take into account both the changes in tax rates that have been legislated to occur over the budget window, as well as adjustments to the taxable portion of income consistent with the current Congressional Budget Office macroeconomic forecast.[4] As can be seen from the table, adjusting the income and payroll tax offset for the changes in the tax rates raises the offset from 24.4 percent in 2012 to 29.8 percent in 2022.[5]

[4] For the calculation of the taxable amount of income factors, other than the corporate calculation, the NIPA forecasts are from CBO, and the taxable portions are from the Joint Committee staff individual income tax model. The corporate taxable portion is held constant at the 2007 level. See *The Budget and Economic Outlook: Fiscal Years 2012 to 2022*, January 2012, Washington DC, http://www.cbo.gov/publication/42905.

[5] The lower rate in 2012 reflects the effects of the temporary two percentage point payroll tax reduction.

CONGRESSIONAL BUDGET OFFICE
U.S. Congress
Washington, DC 20515

Douglas W. Elmendorf, Director

May 15, 2009

Honorable Henry A. Waxman
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

The potential introduction of carbon cap-and-trade policies raises complicated questions about how those policies might be reflected in the federal budget. In response to such questions, the Congressional Budget Office (CBO) has prepared the enclosed description of how it plans to assess those budgetary impacts. Federal legislation to limit the emission of greenhouse gases (GHGs) through the issuance of tradable allowances effectively would create a new type of financial instrument of significant value and liquidity. The document explains CBO's view that the value of such allowances—whether auctioned or freely distributed—should be recorded on both the revenue and outlay sides of the federal budget. It also describes CBO's position regarding the circumstances in which net revenue from the allowances would be less than the value of the allowances themselves because of a so-called "revenue offset." The examples used to illustrate various possible budgetary outcomes involve electric generating companies and local distribution companies (LDCs), which have been a focus of your and other policymakers' recent discussions.

I hope this information is helpful to you. If you have any questions or concerns, I would be happy to discuss them with you. The CBO staff contacts on this subject are Frank Sammartino, who can be reached at 226-2680, and Theresa Gullo, who can be reached at 226-2800.

Sincerely,

Douglas W. Elmendorf

Enclosure

cc: Honorable Joe Barton
Ranking Member

Congressional Budget Office

The Budgetary Treatment of Emission Allowances Under Cap-and-Trade Policies

The potential introduction of carbon dioxide cap-and-trade policies raises complicated questions about how those policies might be reflected in the federal budget. Federal legislation to limit the emission of greenhouse gases (GHGs) through the issuance of tradable allowances effectively would create a new type of financial instrument of significant value and liquidity. This letter explains the Congressional Budget Office's (CBO's) view that the value of such allowances—whether auctioned or freely distributed—should be recorded on both the revenue and outlay sides of the federal budget. The letter also describes CBO's position regarding the circumstances in which the government's net revenues from the allowances would be less than the value of the allowances themselves because of a so-called revenue offset. The examples used to illustrate various possible budgetary outcomes involve electric generating companies and local distribution companies (LDCs), which have been a focus of policymakers' recent discussions.

Tradable Emission Allowances and the Federal Budget

When considering the appropriate budgetary treatment for new federal activities, CBO relies heavily on the guidance provided by the 1967 *Report of the President's Commission on Budget Concepts*. The commission recommended that the federal budget be "comprehensive of the full range of federal activities. Borderline agencies and transactions should be included in the budget unless there are exceptionally persuasive reasons for exclusion."

Clearly, federal efforts to control GHG emissions through a cap-and-trade system would be promulgated and enforced through the government's sovereign powers and would alter the usage of scarce economic resources. Under recent cap-and-trade proposals, the federal government would determine both the scope of covered emissions and the number of allowances to be issued. Moreover, the allowances would be traded in a large and liquid secondary market, which would make them "cash-like" in nature.

Under those circumstances, the distribution of allowances by the federal government would be essentially equivalent to the distribution of cash grants, so CBO believes that such distributions should be treated as outlays. At the same time, allowances in a cap-and-trade system would be valuable financial instruments, so CBO thinks that the creation of allowances by the federal government should be recorded as revenues.

That logic does not hinge on whether the federal government sells or, instead, gives away the allowances. Allowances would have significant value even if given away because the recipients could sell them or, if they are carbon dioxide emitters, use them to avoid incurring the cost of purchasing allowances or investing in costly emission mitigation mechanisms. Therefore, selling the allowances and giving entities cash, and giving

entities the allowances themselves and letting the entities realize their value, are essentially the same transaction. Sound budgeting requires that the budget treat equivalent transactions in the same way.

Consider the following examples. In each, an electric generating company is allowed to generate $100 worth of emissions, an LDC receives $100 in cash, and the government's financial position is unchanged (except for subsequent indirect effects on tax collections, as discussed below):

- The government sells a $100 allowance to an electric generating company and gives the money to an LDC.

- The government imposes an emission tax of $100 on an electric generating company and gives the money to an LDC.

- The government gives a $100 allowance to an LDC, which sells it to an electric generating company for $100.

In the first and second examples, the government budget would clearly show an additional $100 in revenues and $100 in outlays. Because the third example is an equivalent transaction, it should be recorded the same way in the budget.

Some might question why the cap-and-trade method of regulating emissions should warrant inclusion in the federal budget, while other methods such as directly controlling GHGs through requiring the use of different technology or mitigation systems would not. A fundamental difference is that cap-and-trade systems create cash-like assets whose supply is determined by the government, while command-and-control approaches do not.

Potential Offsets to Revenues from Emission Allowances

Under cap-and-trade proposals, the cost of purchasing emission allowances would become an additional business expense for companies that must comply with the cap. These additional expenses could result in decreases in taxable income somewhere in the economy, which could produce a loss in government revenue that would partially offset the revenue from the allowances themselves.[1]

Consider an electricity generator that purchases $100 worth of allowances from the federal government:

- If the generator could not pass that expense on to its customers, its profits and therefore taxable income would decline by $100. On average, the tax on additional income (across businesses and households) is roughly 25 percent. By long-standing convention, CBO, the Joint Committee on Taxation, and the

[1] For a further explanation of revenue offsets, see Congressional Budget Office, *The Role of the 25 Percent Revenue Offset in Estimating the Budgetary Effects of Legislation* (January 13, 2009), available at http://www.cbo.gov/ftpdocs/96xx/doc9618/01-13-25PercentOffset.pdf.

Treasury Department would apply that 25-percent tax rate to the $100 income decline and estimate that income and payroll tax revenue would fall by $25. This "revenue offset" means that the net additional revenues collected under the cap-and-trade system would be $100 minus $25, or $75.

- Alternatively, if the generator could pass that expense on to its customers by raising prices, its profits would be unchanged. However, since consumers would spend $100 more on electricity due to the higher prices, they would have $100 less to spend on other goods. As a result, the profits and wages received by producers of those other goods would fall by $100. Again, that drop of $100 in taxable income would reduce the federal government's tax receipts by $25 and net additional revenues under the cap-and-trade system to $75.

The situation is complicated further because cap-and-trade proposals often include provisions to return some or all of the proceeds from the sale of emission allowances to individuals and businesses. Depending on the manner in which the proceeds are conveyed to private entities, the reduction in taxable income in the preceding examples (the "revenue offset") might be accompanied by a matching increase in taxable income elsewhere in the economy. In these cases, CBO would view the distribution of the allowance proceeds as creating an "offsetting offset" that would compensate for the initial loss of tax revenues from the sale of the allowances and make the net revenue from that sale equal to the value of the allowances themselves. (Although it may appear that this terminology is deliberately confusing, it is chosen to be consistent with the long-standing treatment of revenue offsets.)

Again, some examples may help illuminate the situation:

- If the government took $100 received from selling allowances and gave it to a taxable entity in a manner that increased its taxable income, that higher income would generate $25 in additional tax revenue. The tax receipts gained through this method of "recycling" of the auction revenue would equal the $25 tax loss created when generators needed to purchase allowances from the government. The revenue offset would have an offsetting offset, so the net change in revenue would be the $100 gained from selling allowances. (The net change in the government's outlays would also be $100, and the outcome would not affect the budget deficit.)

- If the government took $100 received from selling allowances and gave it away in a manner that did not increase some entity's taxable income, there would be no gain in tax revenue to offset the $25 decrease in tax collections caused by the added cost to generators. The net revenue offset would be $25, and the government's net revenue gain from the sale and distribution of allowances would be $75. (Outlays would rise by $100.) Examples of government uses of the money that would not increase taxable incomes include:

    - Revenue given to non-taxable entities, such as low-income households.

- Direct government expenditures of $100 on goods and services, such as research and development, or weatherization projects. Under the assumption governing CBO budget estimates that legislation does not affect the size of the economy—a topic to which we return shortly—the government's purchases of goods and services would displace other spending in the economy and would not cause a net increase in income.

- Revenue given to other entities with instructions that they use it in particular ways, such as for research and development or weatherization projects. This approach would be equivalent to the government paying for those items directly.

Fixed Nominal GDP and Revenue Offsets

It may seem inconsistent that providing money to businesses or households in certain ways—such as taxable transfers—is assumed to raise overall taxable income, but that providing money to them in other ways—such as purchases of goods—does not. Yet, this result is consistent with long-standing budget conventions and economic logic.

When CBO estimates the effect of proposed legislation on revenues and outlays, it assumes that the legislation would not affect nominal or real (inflation-adjusted) gross domestic product (GDP). One reason for this assumption is that the effects of legislation on overall economic output and prices are quite uncertain and depend upon the underlying level of economic activity. If the economy is at full employment, additional spending may primarily increase prices, but if there is slack in the economy, additional spending may increase real employment and earnings. (In the former case, assessing the full budgetary impact of a proposal would require estimates of the effect of higher prices on outlays through entitlement programs and on discretionary outlays that aimed to support government programs at a given inflation-adjusted level.) In addition, the effect of legislation on the economy depends on the policy of the Federal Reserve, which is trying to stabilize economic activity and keep inflation low. The Fed might respond to legislation that tended to change nominal GDP in a manner that kept the economy close to the same level of output and prices. Another reason for the assumption of fixed GDP is to maintain consistency across the treatment of different legislation. If assumptions about the underlying level of economic activity were constantly changing as legislation was introduced and enacted, the cost of proposals would depend upon whether other legislation had already been introduced.

Further Examples of Revenue Offsets for Emission Allowances

In CBO's view, giving away allowances is equivalent, in economic and budgetary terms, to selling them and giving away the proceeds. Therefore, the concepts of "revenue offsets" and "offsetting offsets" also apply to transactions involving the distribution of allowances at no cost. Further examples below illustrate how CBO would estimate the budgetary impact of giving away cap-and-trade emission allowances. These examples involve giving away allowances to electricity generators and local distribution

companies. In all of these examples, electricity generators are assumed to need $100 of allowances to cover their emissions.

In some cases, the revenue offset caused by the issuance of allowances would have an offsetting offset, which means that the revenue from the allowances would equal $100, the value of the allowances themselves, and the overall proposal would be budget neutral ($100 in revenues versus $100 in outlays for giving away the allowances). Examples include:

- Allowances worth $100 are given to LDCs, which sell the allowances to electricity generators and use the proceeds to counteract the price increases that consumers would otherwise face. Counteracting the price increases can take the form of reductions in the charges per kilowatt-hour of electricity or a fixed-dollar credit or rebate on the electricity bill. In that case, generators would increase their electricity prices to reflect the cost of the allowances and therefore have no change in their taxable income. The LDCs would have no net change in their income, and consumers would face the same total cost of electricity as before the proposal was enacted. Overall taxable income would be unaffected by the policy.

- Allowances worth $100 are given to generators of electricity that operate in markets where pricing is governed by competitive forces (rather than by regulation). The cap on emissions would increase the marginal cost to some producers of generating electricity, and the marginal cost of the highest-cost producer is what determines prices in a competitive market; therefore, generators in competitive markets could sell electricity at a higher price. The generators' profits would be $100 higher because they received the allowances for free but were able to raise their prices, but consumers would have $100 less to spend on other goods and services, leading to $100 less taxable income somewhere in the economy. Again, overall taxable income would be unaffected by the policy.

In other cases, the revenue offset caused by the issuance of allowances would not have an offsetting offset, which means that the net revenue from the allowances would be $75, less than the value of the allowances themselves, and the overall proposal would not be budget neutral (yielding $75 in net revenues versus $100 in outlays for giving away the allowances). An example is:

- Allowances worth $100 are given to LDCs, which sell the allowances to electricity generators and use the proceeds to finance household weatherization projects. Because this case is especially complex, we first discuss the effects apart from the weatherization projects and then discuss the effects of those projects.

  Leaving aside the weatherization projects, generators would increase their electricity prices to reflect the cost of the allowances and have no change in their taxable income. The LDCs also would see no net change in their income. However, consumers' electricity expenditures would increase by $100, so they would spend less on other goods and services, leading to $100 less taxable income

somewhere in the economy. Nominal GDP would be unchanged through this substitution: More GDP in the electricity sector because of higher prices, and less in other sectors through lower prices there. But taxable income would decline by $100, and tax revenues would fall by $25.

The remaining piece is the extra spending on weatherization projects by the LDCs. This is assumed, by the logic described above, to be offset by lower spending on something else to keep nominal GDP unchanged, so that spending would induce no change in overall taxable income. Thus, the reduction in taxable income due to the higher electricity prices would be the only change affecting tax receipts, and federal revenues would fall by $25.

One might argue that this example is similar to the previous example in which the LDCs kept consumers' electricity prices from rising (and in which federal revenues did not fall) because both involve giving resources back to consumers. However, this example differs from the earlier one due to the increase in electricity prices that, by the assumption of fixed nominal GDP, must be offset by lower spending elsewhere in the economy. Put differently, making resources available for other spending is not comparable in its effect on overall output and income to preventing a price increase for existing spending.

These examples are conceptual in nature. CBO's determination of the net budgetary consequences of a cap-and-trade program would depend on the specific language of proposed legislation. If legislation allocated allowances to LDCs but did not provide explicit instructions about the use of the revenue from selling the allowances, then CBO would make a judgment call about the likely use of the revenue. To inform that judgment, CBO would consult with LDCs and their regulators to gain a better understanding of how they would probably proceed under those circumstances. Based on those consultations, CBO would estimate what fraction of the allowance receipts would be spent in ways that would result in a budget-neutral outcome (that is, an increase in income and payroll tax collections that would offset the loss of tax revenues from the issuance of the allowances) and what fraction would be spent in ways that did not result in an increase in other tax collections and thus would not be budget neutral.

May 15, 2009

From: Jaffe, Judson
To: Metcalf, GilbertDisabled
Subject: RE: MIT Paper
Date: Thursday, September 13, 2012 9:17:00 AM

I'll have to take a look at the paper and the back and forth more.(b)(5) [redacted]

_____
Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

-----Original Message-----
From: Metcalf, Gilbert
Sent: Thursday, September 13, 2012 9:14 AM
To: Jaffe, Judson
Subject: FW: MIT Paper

Terry and I have gone back and forth on this as she has found John Reilly's (b) (5) [redacted]

(b) (5) [redacted]

Plausible to me. Make sense to you?

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Terry Dinan [mailto:Terry.Dinan@cbo.gov]
Sent: Wednesday, September 12, 2012 10:07 AM
To: Metcalf, Gilbert
Subject: MIT Paper

Hi Gib,

Just wanted to let you know that I really didn't get much further in understanding what's driving the MIT results. John's primary explanation (see below, if you like) is that the carbon tax is less distorting than the other taxes because we don't currently have a tax on energy whereas we have significant taxes on capital, labor and personal income. Based on my understanding of the literature, that would

not explain their results because it doesn't account for the tax interaction effect of the carbon tax. I asked him if he thought that it could be the case that the carbon tax is falling on fixed capital in his model, but his answer in not really definitive.

I told you that I'd let you know what I heard from him, so am filling you in even though I don't really have any answers. Please let me know if you have any further thoughts or insights.

Thanks again for your help with this.

Terry

From: John M Reilly [(b) (6) @MIT.EDU]
Sent: Wednesday, September 12, 2012 8:14 AM
To: Terry Dinan
Subject: Re: question on your paper

To the extent that operates it is in our model. These are relatively complex things.

Sent from my iPhone

On Sep 11, 2012, at 7:45 PM, "Terry Dinan" <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>> wrote:
We seem to be talking past each other.

Your explanation makes sense, but doesn't account for the tax interaction effect. That is, the carbon tax increases final good prices, which in turn lowers real returns to capital and labor. That means that the carbon tax acts as an implicit tax on capital and on labor, adding to the the already large distortions caused by existing taxes on them. Most of the literature finds that the tax interaction effect is 3 to 4 times larger that the direct cost of the carbon tax. Because the carbon tax is, in effect, an implicit tax on both capital and on labor, it can be more efficient than a tax on capital OR than a tax on labor, but it cannot be more efficient than both capital and labor taxes. The only explanation that I can think of that would make this true is if you found that much of the carbon tax was falling on FIXED capital. Does your model differentiate between fixed capital in the energy sector and other types of capital? If so, do you have the ability to determine how much of the carbon tax is borne by that capital?

_____
From: John M Reilly [(b) (6)@MIT.EDU<mailto(b) (6)@MIT.EDU>]
Sent: Tuesday, September 11, 2012 5:59 PM
To: Terry Dinan
Subject: Re: question on your paper
Oh--this is the classic issue. The distortion cost per unit change in the tax rate is proportional to how big the initial distortion is. If you start with a good that has virtually not tax--energy in the US. the first incremental increase in the tax is the usual welfare triangle, and the distortion cost is relatively small. But with labor and capital taxation or any other taxes where the marginal tax rate is 25 to 35% or more, the the marginal distortion with the last unit of the tax is not a triangle--it is the combination of a large rectangle and a small triangle--the small triangle is of the order of the energy deadweight loss triangle, but the rectangle is something the energy/carbon tax does not have-it is non-marginal. (And the personal income tax on labor and the payroll tax are both just labor taxes--they are just distributed a little different by income level, but you add them together--along with state level personal income taxes to get the marginal rate on labor. E.g. If my marginal income tax bracket is 30%, the payroll tax is 7%, and my state income tax is 5%, then my marginal tax rate on labor is 42%. It then doesn't matter which of those I cut by, e.g., a percentage point--my marginal tax on labor will fall from 42 to 41%. The tax on labor income and the payroll tax ought to be about the same--the only difference is that on high incomes the payroll tax phases out. So if I am sufficiently above the phase out, cutting the payroll tax by a percentage doesn't affect my marginal tax rate at all but that is generally a small difference and only applicable to the highest incomes.).

So take this example: if labor taxes are $35 dollars on $100 of income, elasticity of labor is .3, then if we reduce labor taxes by $1--or lets say that is 1% of the 100, then we expect labor to increase by .3 units. The reduced deadweight loss will be the rectangle of $34-the length of the remaining tax times the labor change (.3 X $34)= 10.2 + (approximately the triangle 1/2 X $1 X .3)= $.15. So the total

reduced deadweight loss is $10.35.

Now contrast that with the added deadweight loss from a carbon tax, starting from 0$ and going to 1$, and lets assume a similar elasticity of .3. The deadweight loss from that change is just the triangle 1/2 X $1 X .3 = $.15.

So the gain from cutting the labor tax is much much greater than the deadweight loss from the carbon tax. $10.35 >>>>$.15.

So you can see in this example, that even if we reserve 25% of the carbon tax revenue for revenue neutrality, and hence can only cut income taxes by $.75 instead of a dollar. The deadweight loss savings is still going to be much greater.

Similarly if the marginal tax on capital is 39%. And here the capital tax is a combination of taxes paid on equity income and the corporate income tax, then the same numerical example is going to hold.

so these are roughly real examples, and just point out how important it is in this calculation where you are starting from. If the initial distortion is very large then a marginal change is going to have a very big effect. Different elasticities can be important, but you can see in this example that even huge differences in the elasticities are not going to overwhelm the huge difference in initial starting point.

Of course as you increase the carbon tax to higher levels the change becomes larger and the deadweight loss grows, and so at some point--- a high enough carbon tax, you will be on the other side of this equation. If the carbon tax is up to 50%, then you will have a similar huge deadweight loss from the additional increase --going from $50 to $51. The deadweight loss will be $50X.3 + 1/2 X $1X.3 = $15.15. So by this point the total marginal deadweight loss from the carbon tax is greater than reduce deadweight loss from the reduction in labor or capital taxes.

So exactly because all of these existing tax rates are much higher (and of similar magnitude) than that tax rate on energy/carbon, we should expect these to all have very similar effects. If a cut of one these had a benefit and the other did not--that would be bizarre.

Of course with the carbon tax of $20 per ton and rising--that is already probably a 20% tax on coal, we are probably in the study eventually to a point where a further marginal increase in the carbon tax rate is actually welfare reducing--but we are not comparing marginal changes, and it turns out by coincidence that this particular rate, given energy prices and how they are changing, is just about at the point where if we raised a bit more, the total welfare effect would turn negative. I.e the marginal effect of raising the tax from $19 to $20 probably already quite negative, but it is not enough to offset the huge benefits associated with going from $0 to $1, $1 to $2, etc.

There are other complex interactions going on in a CGE model but the simple arithmetic above is going to dominate things when there is this huge difference in initial tax rates. I should note that in a paper in JEEM around 2003--Babiker, Metcalf, Reilly--we did find that for Europe the adding the carbon tax their and cutting taxes led to the result that this reduce welfare further, because there the gasoline taxes were already so high, that this change further worsened the relative price distortion between energy and capital and labor. So it can go both ways, but it depends largely on the initial level of taxes in the two markets you are comparing.

John

On Sep 11, 2012, at 4:54 PM, Terry Dinan wrote, e.g.,

My problem is that I can understand how a carbon tax could be more distorting than capital taxes, personal income taxes or labor taxes, but not more distorting than all three. That is, since the carbon tax exacerbates the distortions caused by ALL of those existing taxes, it must be LESS distortionary than

at least one of them, so not all three tax swaps can improve welfare. E.g., suppose that 50 percent of the carbon tax falls on labor and 50 percent falls on capital and that labor supply is more inelastic than the supply of capital. In that case a carbon tax could improve welfare only if it was used to reduce capital taxes but not if it was used to reduce labor taxes.

From: John M Reilly [mailto:(b)(6) @MIT.EDU]
Sent: Tuesday, September 11, 2012 4:13 PM
To: Terry Dinan
Subject: Re: question on your paper

It is a tax swap. If it were just the carbon tax and a lump sum recycle, there would be a cost. By reducing capital and labor taxes, it is avoiding some of the distortions those cause and those avoided distortions are offsetting the direct cost of the carbon tax.

From: Catrina Rorke
To: Jaffe, Judson
Subject: Thoughts on Troubleshooting
Date: Friday, August 03, 2012 6:03:44 PM

Jud, hope you're doing well and enjoying the Olympics!

I've been doing some thinking on what you might be able to work on from your position, and here are a few ideas. Let me know if you want to talk any of them over?

>Point of implementation issues (I know Gib's done a lot of work on this - any questions left?)
>EITE solutions (It may be interesting to see what these guys pay in corporate taxes now so we can gauge what the possible win/loss is if we imbed the carbon tax in corporate tax reform - any ideas?)
>Compensation for coal-heavy regions (We can expect coal states to fight for some specific benefit, what could that look like?)
>Compensation for regressivity (It's relatively easy to build the increased cost of energy into social security through the COLA. Are there any other fixes we'd have to make?)

This is a short list of complications I ran into while with Bob. We pretty much didn't address anything, because ours was more of an "idea piece," and I think it would be helpful to have the right people think these issues through.

Would love to hear your thoughts on this.

Enjoy your weekend,

Catrina

Catrina Rorke
Director of Energy Policy
American Action Forum
(b) (6)
(b) (6)@americanactionforum.org(b) (6) @americanactionforum.org>

From: Lien, Elizabeth
To: "Brown, Jessica S"
Subject: DRAFT AGENDA_USG comments
Date: Wednesday, June 20, 2012 10:50:00 AM
Attachments: DRAFT AGENDA_USG comments.docx

Here are my comments. I just forwarded to Beth too so I'll let you know if she has anything else to add or change. I told her we need comments by COB today so Georg and Zaheer have it in their inboxes by tomorrow morning. Is that ok?

DRAFT AGENDA
First Workshop on Long-term Finance
Bonn, Germany
9–11 July 2012
[Draft 18.06.2012]

(b) (5)

From:	Lien, Elizabeth
To:	Urbanas, Elizabeth (Beth)
Subject:	LTF DRAFT AGENDA_USG comments
Date:	Wednesday, June 20, 2012 10:49:00 AM
Attachments:	DRAFT AGENDA_USG comments.docx

Beth,
Attached is a draft agenda for the LTF workshop coming up in July. Georg and Zaheer have offered to consider our comments on the agenda and the attached document has Jessica's and mine. Do you have any to add or change? Or should I loop anyone else in (I would normally hit up Bella for comment but will pass since she's in Rio)? I think Jessica and Paul want to get comments by the end of today so that Georg and Zaheer have it in their inboxes tomorrow morning.

Thanks,
Elizabeth

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DRAFT AGENDA
First Workshop on Long-term Finance
Bonn, Germany
9–11 July 2012
[Draft 18.06.2012]

(b) (5)

From: Lien, Elizabeth
To: Urbanas, Elizabeth (Beth)
Subject: (b)(5)
Date: Monday, July 02, 2012 5:43:00 PM
Attachments: (b)(5)

Beth,
Here are Paul's talking points for the panel discussion at the LTF workshop next week. (b)(5)

Does the U.S. support redirecting fossil fuel subsidies for climate?

Paul wanted any comments back by noon tomorrow in order to get this to JP and Gib. Obviously once it goes to Gib you can comment too so if you want to wait for that iteration, that's an option too.

Thanks,
Elizabeth

From: Lien, Elizabeth
To: "Bodnar, Paul"
Subject: (b)(5)
Date: Monday, July 02, 2012 5:44:00 PM
Attachments: (b) (5)

Here are my comments. I also just sent it to Beth for any comments she might have.

Thanks,
Elizabeth

From: Lien, Elizabeth
To: "Bodnar, Paul"
Subject: (b)(5) [redacted]
Date: Tuesday, July 03, 2012 12:28:00 PM
Attachments: (b) (5) [redacted].

Okay, here are Beth's comments along with mine again.

Thanks,
e

From:	Metcalf, Gilbert
To:	Jaffe, Judson; Metcalf, Gilbert
Cc:	Urbanas, Elizabeth (Beth)
Subject:	AEI meeting
Date:	Wednesday, July 11, 2012 6:41:00 PM

Note the reference to Ken Green. (b)(5) [redacted]

Diverse group meets in Washington to discuss way forward on carbon

Jean Chemnick, E&E reporter

Published: Wednesday, July 11, 2012

Story updated at 5 p.m.

Climate policy thinkers of every political stripe are set to meet this afternoon at the Washington, D.C., headquarters of the American Enterprise Institute for a closed-door meeting on the future of carbon policy.

The guest list includes representatives from a broad spectrum of groups, from Public Citizen and the Union of Concerned Scientists, to deficit watchdog group Taxpayers for Common Sense, to the R Street Institute, which split off from the conservative Heartland Institute two months ago after Heartland launched its infamous Unabomber ad campaign to undermine belief in man-made climate change.

The meeting was hosted by AEI, and senior economist Kevin Hassett participated. But participants say it was convened by Tom Stokes of the Climate Crisis Coalition.

Véronique Rodman, a spokeswoman for AEI, said the meetings were really "just brainstorming sessions."

Kenneth Green, an AEI scholar who does not plan to attend, said Hassett had been discussing the carbon tax informally with other economists for some time "as a conservative alternative to EPA regulation and the like."

"A bunch of economists still have an academic interest in this idea," he said.

Green said today's meeting appeared to be an outgrowth of that effort.

David Jenkins, government affairs director for ConservAmerica, who planned to attend the meeting, said its organizers had not notified the media because they hoped to foster a frank discussion on the issue of carbon policy without having it become a political football.

"It's like shooting yourself in the foot before you even get started," Jenkins said.

Jenkins, whose group until recently was known as Republicans for Environmental Protection, said that the effort last Congress to pass a carbon cap-and-trade bill became politically polarized in part because it was chewed over in the media and demonized by fossil fuels interests for months before a bill was even introduced.

While he said the bill sponsored by Reps. Henry Waxman (D-Calif.) and Ed Markey (D-Mass.) was "not perfect by any means," he noted that the underlying policy structure of cap and trade was once a Republican construct.

"Now most people would think that trying to do cap and trade is a futile effort," Jenkins said.

"What do we do as a planet in trying to deal with this stuff if every solution that comes up gets shot down and ridiculed and demonized successfully before there's any chance to get political momentum behind it?" he asked.

Jenkins said that part of the answer appeared to be to foster more diverse positions on climate change among Republicans.

Today's meeting follows the establishment yesterday of a program at George Mason University, spearheaded by former Rep. Bob Inglis (R-S.C.), that seeks to drum up grass-roots support for a revenue-neutral carbon tax as a "conservative" solution to climate change (*E&E Daily*, July 11).

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U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
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Email: gilbert.metcalf@treasury.gov

From:	Hall, Daniel
To:	Metcalf, GilbertDisabled; Urbanas, Elizabeth (Beth)Disabled
Cc:	Jaffe, Judson
Subject:	ClimateWire: South Korea votes for cap-and-trade system
Date:	Thursday, February 09, 2012 11:10:04 AM

(b)(5)

http://www.eenews.net/climatewire/2012/02/09/10

EMISSIONS:

South Korea votes for cap-and-trade system

Published: Thursday, February 9, 2012

South Korean lawmakers voted yesterday to establish a cap-and-trade system for the nation by 2015, following similar programs being put in place in Australia and New Zealand.

The measure continues to be opposed by industry groups, which say it would place an unfair burden on Korean industries as they compete with nations, like China and Japan, that have not passed comparable legislation.

The measure passed Tuesday sets limits on nearly 500 of South Korea's largest industries starting this year, although the cap-and-trade scheme will not kick in for three years.

"The legislation is the first step toward becoming an advanced country," said Kim Jae Yun, an opposition party member. "We can resolve [the issues] companies are concerned with."

The issues raised by the Federation of Korean Industries (FKI), a representative group for 500 large companies in South Korea, primarily revolve around competition with other nations and the questionable necessity of immediate action.

"Our position remains intact," said Im Sang Hyug, deputy secretary-general of the FKI. "We are opposing the legislation on carbon-emission trading. It's doubtful whether we need the bill, as the government targets for cuts already began this year."

Kim Tae Yoon, head of the Strategic Industries Team of the FKI, said, "Our main industries, such as semiconductor, steel, refining and petrochemicals, are competing with rivals in China, the U.S. and Japan, which didn't implement emissions trading."

He predicted that emissions limits might reduce sales by 4 trillion won to 14 trillion won ($3.5 billion to $12.5 billion) a year.

South Korea is the world's eighth-largest emitter of greenhouse gases. It aims to have reduced its emissions by 30 percent of forecast levels by 2020 (Sangim Han, Bloomberg, Feb. 8). **-- NM**

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To:	Metcalf, GilbertDisabled; Fitzpayne, Alastair
Cc:	LeCompte, Jenni Disabled; Alaimo, KaraDisabled; Secreto, Marissa
Subject:	FW: Daily Caller: Free-market think tank sues Treasury Dept. for withholding internal carbon tax documents
Date:	Tuesday, September 11, 2012 5:00:40 PM

(b)(5) [redacted]

From: Ma, Stephanie
Sent: Tuesday, September 11, 2012 3:30 PM
To: _DL_Spokesmen
Subject: Daily Caller: Free-market think tank sues Treasury Dept. for withholding internal carbon tax documents

Free-market think tank sues Treasury Dept. for withholding internal carbon tax documents

2:33 PM 09/11/2012

On Monday, the Competitive Enterprise Institute announced it had filed a lawsuit against the Treasury Department to compel them to "stop stonewalling" and release internal documents related to plans for a "possible effort" to enact a carbon tax during Congress' lame-duck session this fall.

"Plans for post-election tax hikes are precisely the type issue that taxpayers deserve to have discussed openly, pre-election," Chris Horner, CEI senior fellow and author of "The Liberal War on Transparency," told the Daily Caller News Foundation.

Detecting a concerted effort to pass a carbon tax, CEI filed a Freedom of Information Act request on August 8 with the Treasury Department Office of the Deputy Secretary for Environment and Energy and also with the Office of Legislative Affairs, asking for "deliberations pertaining to the carbon tax."

"Despite President Barack Obama's repeated promises for openness and transparency in government, the Treasury Department failed to even acknowledge CEI's FOIA request as required by law." wrote Horner.

"This is an unusual step given the tools available to delay producing records typically invoked only for the most inconvenient requests for records," Horner continued.

In early August, Washington Democrat Rep. Jim McDermott introduced a carbon tax bill, the Managed Carbon Price Act of 2012, to reduce CO2 emissions by 80% of 2005 levels within 42 years of the bill being enacted.

"The American people care about the deficit and they're worried about climate change–and we can fix both without hurting the economy," McDermott said in a statement.

The first price on greenhouse gas substances will start 2 years after the bill's passage, to allow industry to prepare. It also requires the Treasury Secretary to sell emissions permits, which can only be be bought or refunded from the Treasury, and can't be traded.

A recent Brookings Institution report said if the starting price were set at $15 per ton, an estimated $80 billion

could be raised, rising to $170 billion in 2030 and $310 billion by 2050.
“Mitt Romney’s Economic Advisor Greg Mankiw, Exxon-Mobil, the American Enterprise Institute and other conservatives have backed this concept because they know we have to wean ourselves off of carbon emitting energy sources, and do it in a way that doesn’t hurt our economy and makes sense for businesses,” McDermott added in his statement.

Democrat Senate Majority Leader Harry Reid of Nevada also expressed hope that the Senate would take up the issue as well.

A carbon tax has reportedly been gaining popularity in some conservative circles, including a new group launched in July by former South Carolina Republican Rep. Bob Inglis aimed at promoting the idea of a revenue-neutral tax on carbon on the right.

“What we have been doing so far is sort of shrinking in science denial and holding onto shaky ideology that really will be overwhelmed by the facts,” Inglis said in an interview.

However, many on the right still oppose a tax on carbon emissions, with CEI being among the most vocal.

“They’re looking at a European-style VAT or carbon tax to underwrite their vision of a society admittedly modelled after Europe,” Horner told the DC News Foundation.

“It’s hard to believe that Democrats in Washington are introducing an energy tax on consumers, especially as Americans are out of work and the economy remains sluggish,” Oklahoma Republican Senator James Inhofe said about McDermott’s carbon tax bill.

“It’s time for my friends on the other side of the aisle finally to get through the grieving process on cap-and-trade, move on from these failed, dead policies, and begin to embrace the enormous potential of America’s abundant energy resources,” Inhofe continued.

Even a coauthor of an AEI study done in 2007 on the possibilities of a revenue-neutral carbon tax has changed his mind on the issue.

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From: Metcalf, Gilbert
To: "Cameron Smith"
Subject: FW: NJ: Return of the Carbon Tax?
Date: Friday, May 04, 2012 2:11:00 PM

Here it is. Would love to talk to you about your thinking when you are ready.
g

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http://nationaljournal.com/member/magazine/carbon-and-the-tax-reform-conversation-20120503?print=true

Carbon Conversations: Return of the Carbon Tax?

Some policymakers believe that corporate tax reform will provide an opportunity to reach a long-elusive deal on carbon emissions. Just don't call it a tax.

by Coral Davenport

Updated:
May 3, 2012 | 2:00 p.m.

What do Exxon Mobil, the nation's biggest oil company and a powerhouse of GOP influence, and Rep. Henry Waxman, the liberal California Democrat and a well-known foe of big oil, have in common? They both—along with a long list of influential economic thinkers from across the political spectrum—support the idea of putting a price on the carbon pollution that causes global warming.

Climate-change policy, of course, has become an explosively divisive issue in Washington and on the campaign trail, and conventional wisdom has held that any efforts to reform climate or energy policy in the near future are DOA in Congress. But a new idea is percolating among energy, environmental, and economic experts: An overhaul of the U.S. tax code could also serve as a vehicle to enact a carbon tax and potentially transform the nation's energy economy. The opportunity could arise if Congress, as expected, takes up tax reform next year.

The overall objective will be to boost U.S. global competitiveness and to simplify the code by lowering the 35 percent corporate tax rate and eliminating a host of breaks and loopholes. Lawmakers will also be grappling with the nation's staggering budget deficit and how to close it. That's where a potential deal on carbon comes in.

A tax on carbon—which is produced by almost every aspect of the U.S. energy economy, from coal-fired power plants to gasoline-burning automobiles—would raise the cost of coal and oil, drive consumers to new forms of energy, and potentially increase the nation's tax revenues. Republicans and fossil-fuel interest groups have slammed the idea for years as an unacceptable drag on the economy. But the bet is that in a broader fight about billions of dollars, corporate America might be willing to accept a new tax on carbon pollution in exchange for lower rates somewhere else.

Among academics and economists, the carbon tax has long had robust support. The idea of a driving up the cost of a commodity that you want to marginalize—think liquor, cigarettes, and, yes, gasoline—is a classic social lever. But among the political class, the logic grows pretzeled. Lawmakers and corporations still feel burned after a high-profile climate-change bill collapsed in the Senate in the summer of 2010 and that fall took with it the seats of many House Democrats who voted for the measure. This failure was a repeat of Congress's first big attempt to fight climate change in 1993, when dozens of Democrats put their political lives on the line to vote for Vice President Al Gore's "Btu tax," essentially a carbon tax by another name. That vote eased the Republicans' sweep of the House in 1994 and contributed to the rise of conservative antitax lobbyist Grover Norquist. The president of Americans for Tax Reform has since committed 238 of the 242 current House Republicans and 41 of the 47 GOP senators to sign a pledge that they won't support any new taxes.

Despite that history, the carbon tax has some powerful corporate allies, chief among them Exxon Mobil. Two years ago, the energy giant let the White House know that although it didn't support the complicated cap-and-trade bill that ultimately passed the House, it did support a straight carbon tax. Exxon Mobil, a lobbying force and a major donor to Republican political campaigns, stands by that position today.

There's a reason, of course, beyond good global citizenship: Exxon Mobil stands to profit handsomely from a carbon tax. The oil company is also the nation's largest developer of natural gas, a cheap source of electric power that produces only about half the carbon pollution of coal. A carbon tax would drive electric utilities to invest in new natural-gas plants, to the benefit of Exxon Mobil's bottom line. And the multinational corporation would still have its overseas markets in which to sell oil.

The carbon tax has lots of other conservative friends, starting with Mitt Romney's economic adviser, Gregory Mankiw. An influential Harvard economics professor, Mankiw wrote a 2007 op-ed in *The New York Times* calling for a carbon tax as a solution to climate change. Conservative economist Arthur Laffer, a member of Ronald Reagan's Economic Policy Advisory Board who is sometimes known as the father of Reaganomics, is also a supporter. Even the right-leaning American Enterprise Institute has put forth a budget proposal that includes a carbon tax. Economist Douglas Holtz-Eakin, who advised Republican Sen. John McCain's presidential campaign and is now president of the conservative think tank American Action Forum, has endorsed various forms of carbon-pricing policy.

"There's a silent consensus on this in the country among thinking economists," Robert

McNally, who served as a senior energy adviser to President George W. Bush and an energy adviser to Mitt Romney's 2008 presidential campaign, told *National Journal*, "but it's considered political suicide."

Well, there is that. Standing in the way of such a revolutionary step forward are people such as Norquist, who was quick to acknowledge to *National Journal* the growing discussion about reviving the carbon tax among conservative thinkers. "None of those guys have a vote in Congress, so that means diddly-squat," he said. "Proposing a further energy tax would get you squished in the next election.… This is an idea perfect for intellectuals, but it will be rejected by anyone who has to get elected.

Still, carbon-tax advocates are nonetheless quietly marshaling forces for a new debate, even as they concede that such an initiative would be a heavy lift. Indeed, few want to talk about it publicly for fear of jeopardizing the proposal before it's even born. "It's a no-brainer for a lot of Republican intellectuals," said one supporter, who asked for anonymity. "But, politically, it's really touchy stuff."

From: Metcalf, Gilbert
To: Brainard, Lael; Jaffe, Judson
Subject: RE: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress
Date: Tuesday, July 31, 2012 4:14:00 PM

Will do

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To: Metcalf, Gilbert; Jaffe, Judson
Subject: FW: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

(b)(5) [redacted]

From: Anderson, Charlie
Sent: Tuesday, July 31, 2012 2:19 PM
To: _DL_FYI
Subject: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

July 31st, 2012
10:18 AM ET

The danger of the do-nothing Congress

Editor's note: GPS sits down with Kenneth Rogoff, Thomas D. Cabot Professor of Public Policy and Professor of Economics at Harvard University, to discuss U.S. political gridlock and the cyber threat to the U.S. economy.

The 112th Congress has been dismissed by many as the ultimate do-nothing Congress. How much is the gridlock in Washington hurting the U.S. economic recovery?

It's hurting a lot and, unfortunately, a lot of things that need to be done aren't getting done. For example, I would like to see Congress pass a version of theSimpson-Bowles tax reform proposal. By far the most efficient way to collect more tax revenue would be to drastically reduce exemptions ("tax expenditures") thereby raising more revenue while keeping marginal tax rates at a reasonable level. With private investment weak, this is a good time for the government to undertake high-return infrastructure projects with a compelling cost-benefit ratio. But the rationale is to improve the long-run growth potential of the economy, not to engage in pure Keynesian stimulus. While I strongly favor instituting a carbon tax, there is some urgency in refocusing our energy program to recognize the huge innovations that are allowing the U.S. to harvest conventional sources of gas and (secondarily oil) that promise to make the United States far less dependent on imported

energy. In principle, our low energy prices could even catalyze a return to the U.S. of some types of manufacturing.

Of course, the Congress has been gridlocked for some time. This gridlock didn't matter so much during the credit bubble; the economy was growing briskly despite – or perhaps because of – limited government intervention or innovation. But we've reached a point where there's been so little reform for so long that it's a hindrance to growth. And, in the near term, things only seem to be getting worse, with ugly partisanship clearing out the center in both major parties.

You wrote earlier this month about the danger a cyber attack could pose to the U.S. What are your biggest concerns on this issue?

I was intrigued by the parallels between the Wild West like unfettered growth of the internet and the parallel growth of the financial sector before the crisis. Like the financial industry before, the superstructure of the web has potential fragilities that could be hugely consequential, yet thanks in part to industry lobbying, there's only limited regulation. Some of the vulnerabilities are very well understood. For example, it the electricity grid depends on all kinds of software that is vulnerable to viruses, and so far only limited steps have been taken to avoid attack, which might involve a re-enforcing combination of cyber and conventional terrorism. The electric grid is a particularly acute vulnerability because if someone takes that down, communications are hit along a huge array of vital services, for example water pumps.

Unfortunately, we are sometimes too reluctant to regulate fast growing industries for fear of throwing out the baby with the bathwater. This is perhaps the right approach for nascent industries but becomes dangerous once they achieve critical mass any collapse is effectively systemic.

Of course, there are multiple federal task forces working on this, but at the same time, my strong impression is that we are barely at the stage of acknowledging the depth of the problem, much less undertaking effective solutions. One approach involves redundancies in the system to better protect them against this problem, but of course that involves investments and potentially higher costs for consumers. Such expenses might seem difficult to justify in a sustained downturn such as we are now experiencing, but these investments cannot be deferred.

A few years back, you wrote a book titled *This Time it's Different: Eight Centuries of Financial Folly*. Have we learned anything this time around?

The first thing to say is that the latest financial crisis has been remarkably similar to past, deep post-war financial crises that Carmen Reinhart and I studied in our 2009 book. Of course, this time, it has been concentrated in advanced countries to a degree that that hasn't been seen since the Great Depression.

One key lesson from past crises is that because the aftermath of a financial crisis is so long and so painful, it's important to resist the temptation to seek out quick fixes. Policy needs to keep focused on long-run

fundamentals.

Of course, the eurozone is somewhat different because they are experiencing not only a financial crisis, but a profound governance crisis. In some ways, the euro is just a variant of earlier attempts to use a fixed exchange rate to achieve macroeconomic stability. But precisely because the euro is a much harder form of "fix," the fallout will be even worse if and when if it collapses. No one knows for sure what the ramifications will be, but it surely won't be pretty. The potential demise of the euro casts a huge cloud of existential uncertainty over the global economy.

From: Metcalf, Gilbert
To: Jaffe, Judson
Subject: RE: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress
Date: Tuesday, July 31, 2012 5:10:00 PM

(b) (5) [redacted]

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To: Metcalf, Gilbert
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(b) (5) [redacted]

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Sent: Tuesday, July 31, 2012 4:13 PM
To: Jaffe, Judson
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(b) (5) [redacted]

(b) (5) [redacted]

[redacted]

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From: Jaffe, Judson
Sent: Tuesday, July 31, 2012 3:35 PM
To: Metcalf, Gilbert
Subject: RE: CNN (Ken Rogoff Interview): The danger of the do-nothing Congress

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From:	Metcalf, Gilbert
To:	Earnest, Natalie W.; Fitzpayne, Alastair
Cc:	LeCompte, Jenni; Alaimo, Kara; Hopkins, Marissa; Das, Himamauli; Urbanas, Elizabeth (Beth); Jaffe, Judson
Subject:	RE: Daily Caller: Free-market think tank sues Treasury Dept. for withholding internal carbon tax documents
Date:	Tuesday, September 11, 2012 5:11:00 PM

Looping in Him and others.

(b) (5) [redacted]

Gib

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From: Earnest, Natalie W.
Sent: Tuesday, September 11, 2012 5:01 PM
To: Metcalf, Gilbert; Fitzpayne, Alastair
Cc: LeCompte, Jenni; Alaimo, Kara; Hopkins, Marissa
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From:	Metcalf, Gilbert
To:	Jaffe, Judson
Subject:	Re: From E&E Daily -- CLIMATE: Lawmakers show little appetite for carbon tax -- at least for now
Date:	Wednesday, July 11, 2012 8:57:00 AM

(b) (5)

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From: judson.jaffe@treasury.gov [mailto:judson.jaffe@treasury.gov]
Sent: Wednesday, July 11, 2012 08:43 AM
To: Metcalf, Gilbert
Subject: From E&E Daily -- CLIMATE: Lawmakers show little appetite for carbon tax -- at least for now

This E&E Daily story was sent to you by: judson.jaffe@treasury.gov

Personal message: Fyi

E&E Daily

AN E&E PUBLISHING SERVICE

CLIMATE: Lawmakers show little appetite for carbon tax -- at least for now *(Wednesday, July 11, 2012)*

Jean Chemnick, E&E reporter

The concept of a carbon tax had a rare moment in the sun yesterday when a former GOP congressman made it the centerpiece of his new effort to get Republicans on board with pushing a climate change policy that tracks with their conservative values.

Former Rep. Bob Inglis (R-S.C.) said his newly launched Energy and Enterprise Initiative would look at ways to internalize the societal cost of carbon and let the market do the rest. Inglis proposes refunding the revenue to consumers directly as a dividend -- as proposed in the last Congress by Sens. Maria Cantwell (D-Wash.) and Susan Collins (R-Maine), or through business or labor tax cuts.

"We're rather ecumenical when it comes to how we're going to return the money," he said yesterday.

Lawmakers did not dismiss Inglis' proposal, but none committed to support it, either.

Sen. Lisa Murkowski (R-Alaska) noted that the Senate Energy and Natural Resources Committee briefly studied the effects of a revenue-neutral carbon tax years ago, "back in the days when we were talking about climate change legislation."

"The fact that it's revenue-neutral does have some real appeal there," she said.

But the current economy makes people skittish about changing the tax code, she said, even if increased taxes on one sector were offset with a tax cut somewhere else.

"As with anything around here, timing is the real key," she said.

Sen. Lindsey Graham (R-S.C.), the Republican who was most closely involved in the last Congress' effort to pass a climate change bill in the Senate, said that he would not support any part of the Inglis proposal.

If the carbon tax offset a cut in payroll taxes, as Inglis proposed last Congress in a bill he sponsored, Graham said he would worry that that bargain would shortchange seniors on Social Security.

"I just don't like that idea of changing the payroll tax structure from wage earners," he said.

No matter what form a revenue-neutral carbon tax would take, it would be unlikely to serve the dual purpose of encouraging Americans to use less fossil fuels and providing a funding stream deep enough to offset the elimination of another tax, Graham continued.

"If you're creating a tax on fossil fuels to get off fossil fuels, then it is an unreliable revenue source," he said.

And then there is the problem of getting Republicans to accept a policy that targets carbon dioxide in the first place, he added.

"I don't think you're going to be able to sell to the Congress, 'Let's start taxing energy companies because of theoretical concerns about global warming,'" Graham said.

"I think you can sell energy independence," he continued, adding that a carbon proposal of any kind would be more likely to succeed as part of a comprehensive energy bill that included more domestic energy production than as part of a tax reform package.

The former was what Graham worked on in the last Congress with Sens. John Kerry (D-Mass.) and Joe Lieberman (I-Conn.), though he withdrew before the other two introduced their bill.

Kerry said yesterday that he could see Republicans eventually supporting a carbon tax swap of the kind Inglis suggests. But he echoed Murkowski's sentiment that it was all in the timing.

"I think you've got to see the results of the election to figure out where the 'tax' word is in American politics," he said.

The only way Republicans would accept that a carbon tax was genuinely revenue-neutral would be if it came as part of the "very broad, complete, comprehensive" tax reform bill both parties have said they want, he added.

On the House side, Rep. Jim Moran (D-Va.) said he was more than happy to accept a carbon tax but not to swap it for another revenue raiser.

"We don't have the luxury of removing any taxes at this point, when we're running a trillion-dollar annual deficit," he said.

Inglis had some Republican support for his carbon tax bill in the last Congress, including from Rep. Jeff Flake (R-Ariz.), who was a co-sponsor and is now a candidate for Senate. Inglis yesterday praised Flake as "a real conservative," something he said is in short supply in Congress right now.

"We have populist rejectionism masquerading as conservatism right now," Inglis said. That is something he knows all too well, having been beaten badly in a Republican primary in 2010 by now-Rep. Trey Gowdy (R-S.C.), a tea party favorite.

Inglis said the Republican rejection of climate science has put party members at odds with their usual allies in the insurance industry, who are concerned about how changing weather patterns will increase their risk of doing business.

But Genevieve Rozansky, a spokeswoman for Flake, said that her boss had supported Inglis' bill as an alternative to the Democrats' cap-and-trade bill that passed the House in 2009. He has no plans to introduce it in this Congress, she said.

GOP strategist Mike McKenna said yesterday that a revenue-neutral carbon tax had long been a popular Republican alternative.

"This has been a thread that has run through conversations for years now, and a lot of Republicans have thought, 'You know what? If it ever looks like we're going to lose on cap and trade, let's toss out a carbon tax as an alternative answer,'" he said.

"It's been in the water for a while," he added.

McKenna said Inglis' effort would be unlikely to revive the carbon tax if Inglis were the only one behind it. But he said other, more influential Republicans had taken an interest.

"It's a coordinated effort, right?" he said. "It's not just like one or two of these guys are blue-skying. They've got the money behind it and are working it."

Gregory Mankiw, an economist and adviser to Republican presidential candidate Mitt Romney, and Douglas Holtz-Eakin, president of the conservative American Action Forum and a former adviser to Sen. John McCain (R-Ariz.) when he was the GOP standard-bearer in 2008, were mentioned yesterday as possible supporters of the effort. Both have expressed qualified support for a carbon tax in the past. But Holtz-Eakin said yesterday via email that he was not involved with Inglis' project.

"I have no idea what Mr. Inglis is up to," he said.

Inglis said that the initiative would make the case that "you can be a conservative and also be open to science."

But there does not yet appear to be conservative money going to fund it.

Inglis' initiative is housed at George Mason University, which named the Rockefeller Family Fund and the Energy Foundation as backers of the project. Neither is a conservative organization.

But Inglis said in an email last night that Holtz-Eakin, Mankiw and others had lent "intellectual support" for the carbon tax and touted an alliance with the R Street Institute, formerly the Heartland Institute's Washington, D.C.-based office, which continues to focus on insurance issues. The Washington office split off from Chicago-based Heartland following its decision to run the now-infamous Unabomber climate change billboard earlier this year.

Inglis said the initiative would also work to forge alliances with national security conservatives and the insurance industry.

He said the Rockefeller Family Fund, like him, opposed the House-passed climate bill. The Energy Foundation, which is linked to Hewlett-Packard Co., is also an appropriate partner, he said, "seeing as how the Hewletts and the Packards were all about free-enterprise innovation."

ABOUT E&E DAILY

Environment & Energy Daily (E&E Daily) is written and produced by the staff of E&E Publishing, LLC. Designed for policy players who need to know what's happening to their issues on Capitol Hill, from federal agency appropriations to comprehensive energy legislation, E&E Daily is the place insiders go to track their environmental and energy issues in Congress. E&E Daily publishes daily by 9 a.m. while Congress is in session.

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From:	Metcalf, Gilbert
To:	Jaffe, Judson; Hall, Daniel
Cc:	Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject:	RE: Korea cap and trade
Date:	Friday, May 04, 2012 9:16:00 AM

That would be great. thanks.

Gilbert E. Metcalf
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From: Jaffe, Judson
Sent: Friday, May 04, 2012 9:13 AM
To: Metcalf, Gilbert; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: RE: Korea cap and trade

I have not. But we can pull together a summary.

Judson Jaffe
Office of Environment and Energy
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Phone: 202.622.7751
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Email: judson.jaffe@treasury.gov

From: Metcalf, Gilbert
Sent: Friday, May 04, 2012 8:55 AM
To: Jaffe, Judson; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: Korea cap and trade

Jud or Daniel,
Have you seen any details about this new scheme?

South Korea joins nations preparing cap-and-trade markets

Lisa Friedman, E&E reporter
Published: Friday, May 4, 2012
Senate Foreign Relations Chairman John Kerry (D-Mass.) yesterday hailed South Korea for approving an economywide carbon market as part of a broad government attack on climate change.
Under the measure, approved 148-0 with three abstentions, Korea's cap-and-trade system will take

effect by 2015. The National Assembly vote comes on the heels of sweeping new climate legislation in Mexico and marks Korea as one of a growing number of nations making good on pledges to cut greenhouse gas emissions.

"What else is new?" Kerry said in a statement to *ClimateWire*. "South Korea just joins China, New Zealand, Mexico, Australia and the European Union in seizing the economic rewards of a sustainable economy by putting a price on carbon. The big question is why we're among the outliers.

"It's negligent for Congress to continue ignoring and obstructing when other countries realize they're getting an economic boost out of leading the way," Kerry said.

Environmental activists echoed Kerry's comments. Several said Korea's decision -- made after intense, months-long negotiations with business and industry lobbies, underscores America's absence from the clean-energy race.

"This is definitely a significant development in global climate policy," said Jennifer Haverkamp, international climate director for the Environmental Defense Fund.

"It's not only the first Asian country to go forward and embrace comprehensive climate law, but it's also a fast-growing economy that's basically just graduated from developing to developed country status, and they're looking to the future and very consciously ... decided to benefit from low-carbon economy of the future," she said.

Market linkage could be next step

Keya Chatterjee, director of international climate change policy for the World Wildlife Fund, said: "This is a race, and we're clearly losing." Korea's vote, she said, puts new pressure on the United States to "get together the courage to move" into emissions trading.

But Lee Lane, a visiting scholar at the conservative Hudson Institute, said he is comfortable seeing America's economic competitors take the lead. "If those countries want to substitute more expensive energy for less expensive industry in their own industries, the United States gains competitively from that. So as far as I'm concerned, it's just fine from the standpoint of U.S. national interests," he said. "The farther behind we fall, the better off we are in this particular race."

Moreover, Lane argued, until countries like China and India impose full carbon markets, incremental moves by various countries do not add up to enough to curb global emissions.

China currently has several pilot carbon trading programs under way. Speaking in New York earlier this year, the country's top climate negotiator said those could eventually become a nationwide carbon market.

Korea's market, meanwhile, could be linked with Australia, New Zealand and the European Union's markets by 2020, analysts said. Under the program, companies, factories and farms that emit 125,000 metric tons or more of carbon dioxide annually will be subject to the trading system. Over the coming months, Haverkamp said, the government will hammer out the regulations putting the law into action.

She said the new moves by countries like Australia, Mexico and Korea could have a material impact on the global climate talks.

"It's extremely interesting that it's a suite of mid-sized countries who have decided that they're not going to wait around," she said. "The more countries that do it, I think, gives more encouragement to others that it is in their national self-interest to go forward."

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From:	Metcalf, Gilbert
To:	"Cameron Smith"
Subject:	RE: NJ: Return of the Carbon Tax?
Date:	Friday, May 04, 2012 2:17:00 PM

Whoops! I saw Doug's name below AEI and mentally transformed it to AAF. Sorry to cause you any distress.

Gilbert E. Metcalf
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-----Original Message-----
From: Cameron Smith [mailto(b) (6) mericanactionforum.org]
Sent: Friday, May 04, 2012 2:16 PM
To: Metcalf, Gilbert
Subject: Re: NJ: Return of the Carbon Tax?

So the yellow that you highlighted refers to AEI's submission to the Peterson Foundation last summer: http://www.aei.org/files/2011/05/25/Scholar-Peterson-Plan.pdf

They received very little attention or push back on the fact that the tax was included, which I view as a good thing.

When we get our ducks better aligned we'll certainly touch base.

Thanks for sending this!

On May 4, 2012, at 2:11 PM, <Gilbert.Metcalf@treasury.gov> wrote:

> Here it is. Would love to talk to you about your thinking when you are ready.
> g
>
> Gilbert E. Metcalf
> Deputy Assistant Secretary for Environment and Energy
> U.S. Department of the Treasury
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>
>
> http://nationaljournal.com/member/magazine/carbon-and-the-tax-reform-conversation-20120503?print=true
> Carbon Conversations: Return of the Carbon Tax?
>
> Some policymakers believe that corporate tax reform will provide an opportunity to reach a long-elusive deal on carbon emissions. Just don't call it a tax.
>
> by Coral Davenport
>
> Updated:
> May 3, 2012 | 2:00 p.m.

>
> What do Exxon Mobil, the nation's biggest oil company and a powerhouse of GOP influence, and Rep. Henry Waxman, the liberal California Democrat and a well-known foe of big oil, have in common? They both—along with a long list of influential economic thinkers from across the political spectrum—support the idea of putting a price on the carbon pollution that causes global warming.
>
> Climate-change policy, of course, has become an explosively divisive issue in Washington and on the campaign trail, and conventional wisdom has held that any efforts to reform climate or energy policy in the near future are DOA in Congress. But a new idea is percolating among energy, environmental, and economic experts: An overhaul of the U.S. tax code could also serve as a vehicle to enact a carbon tax and potentially transform the nation's energy economy. The opportunity could arise if Congress, as expected, takes up tax reform next year.
>
> The overall objective will be to boost U.S. global competitiveness and to simplify the code by lowering the 35 percent corporate tax rate and eliminating a host of breaks and loopholes. Lawmakers will also be grappling with the nation's staggering budget deficit and how to close it. That's where a potential deal on carbon comes in.
>
> A tax on carbon—which is produced by almost every aspect of the U.S. energy economy, from coal-fired power plants to gasoline-burning automobiles—would raise the cost of coal and oil, drive consumers to new forms of energy, and potentially increase the nation's tax revenues. Republicans and fossil-fuel interest groups have slammed the idea for years as an unacceptable drag on the economy. But the bet is that in a broader fight about billions of dollars, corporate America might be willing to accept a new tax on carbon pollution in exchange for lower rates somewhere else.
>
> Among academics and economists, the carbon tax has long had robust support. The idea of a driving up the cost of a commodity that you want to marginalize—think liquor, cigarettes, and, yes, gasoline—is a classic social lever. But among the political class, the logic grows pretzeled. Lawmakers and corporations still feel burned after a high-profile climate-change bill collapsed in the Senate in the summer of 2010 and that fall took with it the seats of many House Democrats who voted for the measure. This failure was a repeat of Congress's first big attempt to fight climate change in 1993, when dozens of Democrats put their political lives on the line to vote for Vice President Al Gore's "Btu tax," essentially a carbon tax by another name. That vote eased the Republicans' sweep of the House in 1994 and contributed to the rise of conservative antitax lobbyist Grover Norquist. The president of Americans for Tax Reform has since committed 238 of the 242 current House Republicans and 41 of the 47 GOP senators to sign a pledge that they won't support any new taxes.
>
> Despite that history, the carbon tax has some powerful corporate allies, chief among them Exxon Mobil. Two years ago, the energy giant let the White House know that although it didn't support the complicated cap-and-trade bill that ultimately passed the House, it did support a straight carbon tax. Exxon Mobil, a lobbying force and a major donor to Republican political campaigns, stands by that position today.
>
> There's a reason, of course, beyond good global citizenship: Exxon Mobil stands to profit handsomely from a carbon tax. The oil company is also the nation's largest developer of natural gas, a cheap source of electric power that produces only about half the carbon pollution of coal. A carbon tax would drive electric utilities to invest in new natural-gas plants, to the benefit of Exxon Mobil's bottom line. And the multinational corporation would still have its overseas markets in which to sell oil.
>
> The carbon tax has lots of other conservative friends, starting with Mitt Romney's economic adviser, Gregory Mankiw. An influential Harvard economics professor, Mankiw wrote a 2007 op-ed in The New York Times calling for a carbon tax as a solution to climate change. Conservative economist Arthur Laffer, a member of Ronald Reagan's Economic Policy Advisory Board who is sometimes known as the father of Reaganomics, is also a supporter. Even the right-leaning American Enterprise Institute has put forth a budget proposal that includes a carbon tax. Economist Douglas Holtz-Eakin, who advised Republican Sen. John McCain's presidential campaign and is now president of the conservative think tank American Action Forum, has endorsed various forms of carbon-pricing policy.
>
> "There's a silent consensus on this in the country among thinking economists," Robert McNally, who served as a senior energy adviser to President George W. Bush and an energy adviser to Mitt Romney's

2008 presidential campaign, told National Journal, “but it’s considered political suicide.”
>
> Well, there is that. Standing in the way of such a revolutionary step forward are people such as Norquist, who was quick to acknowledge to National Journal the growing discussion about reviving the carbon tax among conservative thinkers. “None of those guys have a vote in Congress, so that means diddly-squat,” he said. “Proposing a further energy tax would get you squished in the next election.... This is an idea perfect for intellectuals, but it will be rejected by anyone who has to get elected.
>
> Still, carbon-tax advocates are nonetheless quietly marshaling forces for a new debate, even as they concede that such an initiative would be a heavy lift. Indeed, few want to talk about it publicly for fear of jeopardizing the proposal before it’s even born. “It’s a no-brainer for a lot of Republican intellectuals,” said one supporter, who asked for anonymity. “But, politically, it’s really touchy stuff.”
>
>

From: McKeehan, Robert
To: Metcalf, GilbertDisabled; Climate Team
Subject: RE: Sen. Rockefeller speech
Date: Tuesday, July 17, 2012 4:10:38 PM

(b)(5)

http://news.stanford.edu/news/2012/july/george-shultz-energy-071212.html

Robert J. McKeehan
Attorney-Advisor
Office of the Assistant General Counsel for International Affairs
U.S. Dept. of the Treasury
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robert.mckeehan@treasury.gov

-----Original Message-----
From: Metcalf, Gilbert
Sent: Tuesday, July 17, 2012 10:28 AM
To: Climate Team
Subject: FW: Sen. Rockefeller speech

A coal senator's progressive view on the industry

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury
(202) 622-0173 (office)
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Email: gilbert.metcalf@treasury.gov

From:	Demopulos, Abigail
To:	McDonald, Gordon; Black, Laura; Strauss, Michael
Cc:	Urbanas, Elizabeth (Beth)Disabled; Metcalf, GilbertDisabled
Subject:	E&E 2012 priorities
Date:	Wednesday, February 01, 2012 4:50:11 PM
Attachments:	(b) (5) [redacted]

Gordon, Laura,

Here is the office's submission for tomorrow.

Abigail Demopulos
Office of Energy & Environment
U.S. Treasury
202-622-5671

NR

From: Strauss, Michael
Sent: Monday, July 02, 2012 2:29 PM
To: Metcalf, Gilbert
Cc: Black, Laura; McDonald, Gordon
Subject: FW: International Affairs, Office of Environment and Energy

Gib,

As we discussed this morning, I'm passing on below a letter of interest and resume for NR

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] I also studied closely other environmental financial mechanisms, including carbon cap and trade and carbon tax policies, and the CDM. [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

From: Metcalf, Gilbert
To: Lien, Elizabeth
Subject: FW: mobilizing $100 billion for climate finance
Date: Friday, June 22, 2012 9:42:00 AM
Attachments: (b) (5)

This is the note I mentioned.

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From: Metcalf, Gilbert
Sent: Wednesday, June 20, 2012 2:53 PM
To: Urbanas, Elizabeth (Beth); Demopulos, Abigail; Tonkonogy, Bella
Subject: mobilizing $100 billion for climate finance

(b) (5)

Gilbert E. Metcalf
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From: Metcalf, Gilbert
To: Berg, Katie
Subject: FW: mobilizing $100 billion
Date: Tuesday, July 17, 2012 11:54:00 AM
Attachments: (b) (5) [redacted]

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(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Metcalf, Gilbert
Sent: Monday, July 16, 2012 5:28 PM
To: Urbanas, Elizabeth (Beth); Demopulos, Abigail; Tonkonogy, Bella; Jaffe, Judson; Lien, Elizabeth
Cc: Das, Himamauli; McKeehan, Robert
Subject: mobilizing $100 billion

(b) (5) [redacted]

[redacted]

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(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Metcalf, Gilbert
To: Urbanas, Elizabeth (Beth)
Subject: FW: mobilizing $100 billion
Date: Thursday, July 19, 2012 8:48:00 AM
Attachments: (b) (5)

Are you or others planning to provide comments/feedback? If so, can I have those by COB Monday, July 23. I'd like to clear a memo with this for Marisa early next week. Thanks.

Gilbert E. Metcalf
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From: Metcalf, Gilbert
Sent: Monday, July 16, 2012 5:28 PM
To: Urbanas, Elizabeth (Beth); Demopulos, Abigail; Tonkonogy, Bella; Jaffe, Judson; Lien, Elizabeth
Cc: Das, Himamauli; McKeehan, Robert
Subject: mobilizing $100 billion

(b)(5)

(b)(5)

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Email: gilbert.metcalf@treasury.gov

From: Metcalf, Gilbert
To: Urbanas, Elizabeth (Beth); Demopulos, Abigail; Tonkonogy, Bella; Jaffe, Judson; Lien, Elizabeth
Cc: Das, Himamauli; McKeehan, Robert
Subject: mobilizing $100 billion
Date: Monday, July 16, 2012 5:28:00 PM
Attachments: (b) (5)

(b) (5)

Gilbert E. Metcalf
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Email: gilbert.metcalf@treasury.gov

From: Metcalf, Gilbert
To: "Cameron Smith"
Subject: NJ article
Date: Friday, May 04, 2012 1:59:00 PM

Cameron,
In a recent National Journal article on carbon taxes, it states that AAF has put forward a budget proposal that includes a carbon tax. Do you have something that you can share with me on that?
Thanks much,
Gib

Gilbert E. Metcalf
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From: Metcalf, Gilbert
To: Jaffe, Judson
Subject: RE:
Date: Thursday, July 12, 2012 1:17:00 PM

(b) (5) [redacted]

(b) (5) [redacted]

On your other email, I was planning to recirculate the new memo to Mark and Jan. I will do that today.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Jaffe, Judson
Sent: Thursday, July 12, 2012 11:10 AM
To: Metcalf, Gilbert
Subject: RE:

Thanks. I'll have to take a look. (b) (5) [redacted]

(b) (5) [redacted]

(b)(5) [redacted]

(b) (5)

Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
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Email: judson.jaffe@treasury.gov

From: Metcalf, Gilbert
Sent: Thursday, July 12, 2012 9:08 AM
To: Jaffe, Judson
Subject:

This paper argues that a BTA for a carbon tax makes non-taxing countries better off relative to a non-BTA world where rates are adjusted to hold emissions constant. (b)(5)

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
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Email: gilbert.metcalf@treasury.gov

From:	Metcalf, Gilbert
To:	Lago, Marisa; Urbanas, Elizabeth (Beth)
Cc:	Morris, Scott; Mathiasen, Karen; Black, Laura
Subject:	Re: 2012 strategic priorities
Date:	Sunday, February 12, 2012 1:50:36 PM

(b) (5) .

Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Lago, Marisa
Sent: Sunday, February 12, 2012 10:25 AM
To: Metcalf, Gilbert; Urbanas, Elizabeth (Beth)
Cc: Morris, Scott; Mathiasen, Karen; Black, Laura
Subject: 2012 strategic priorities

(b) (5)

From: Metcalf, Gilbert
To: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: RE: E&E Priorities for 2012.docx
Date: Wednesday, February 01, 2012 4:07:00 PM
Attachments: (b) (5)

Very clear and thorough. A few minor suggestions.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
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Email: gilbert.metcalf@treasury.gov

From: Urbanas, Elizabeth (Beth)
Sent: Wednesday, February 01, 2012 2:01 PM
To: Metcalf, Gilbert; Demopulos, Abigail
Subject: E&E Priorities for 2012.docx
Importance: High

Here is the list of priorities for the presentation on Thursday. I have used the same general format as the one given us as an example (other directors have told me they are using this as a template too).

Please clear when you can today.

From:	Metcalf, Gilbert
To:	"Terry Dinan"
Subject:	RE: Fwd: question on your paper
Date:	Wednesday, September 12, 2012 1:00:00 PM

Just tried to call you to discuss (and to ask another question). maybe we can talk this afternoon sometime.

Gilbert E. Metcalf
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-----Original Message-----
From: Terry Dinan [mailto:Terry.Dinan@cbo.gov]
Sent: Wednesday, September 12, 2012 12:35 PM
To: Metcalf, Gilbert
Subject: FW: Fwd: question on your paper

Gib,

This response from Sebastian is helpful. It sounds like a significant fraction of the carbon tax is in fact likely to fall on fixed capital in their model. That would explain how they could find that all the tax swaps they look at improve welfare: to the extent that the carbon tax is absorbed by fixed capital, the TIE would shrink, thus, the revenue recycling effect could offset the TIE effect for all three of the tax swaps that they consider (capital, labor and personal income). Do you agree?

Also, I don't actually think the magnitude of the carbon abatement costs can explain the result. Lower abatement costs would imply a smaller TIE (ignoring fixed capital) but would also yield less revenue for revenue recycling, so it doesn't really seem to me that lower abatement costs would, ceteris paribus, make tax swaps more likely to improve welfare. Do you agree?

Thanks,

Terry

From: Rausch Sebastian [mailto:(b) (6) @ethz.ch]
Sent: Wednesday, September 12, 2012 11:40 AM
To: Terry Dinan
Cc: John M Reilly
Subject: Re: Fwd: question on your paper

Terry,

I can fully see your point, and yes the tax interaction effect is important to take into account.

Of course, the issue whether a revenue-neutral carbon tax swap yields a positive welfare change (excluding environmental benefits) is ultimately an empirical question. Even in Goulder's 1995 JEEM paper, he caveats that his analysis does not in general preclude the possibility of a welfare-improving carbon tax swap (see page 289). He even mentions in footnote #41 of this paper that his model generates overall positive welfare effects under certain paramter configurations (e.g., with a sufficienctly high intertemporal elasticity of substitution).

In trying to understand what leads to the overall positive welfare effect in our model, I can think of two

explanations. First, in each sector a significant fraction of capital in each sector is "fixed" or non-malleable and cannot be moved around in any period of the model (the fraction is around 30% for non-electricity sectors and around 70% for the electricity sector). Second, the cost of carbon abatement itself might smaller as compared to what Goulder has in his model (column 2 in Table II in Goulder's paper). Our model includes a number of advanced energy technologies, including renewable techs. We include, for example, small- and large-scale wind and characterize regional resource potentials based on high-resolution wind data from NREL. And wind in our model contributes significantly to the electricity generation mix under a carbon tax. I would imagine that Goulder results are sensitive with respect to the costs of the backstop technology. His model is not very detailed on the advanced energy techs in that it only includes one single, generic backstop. I would not be surprised if his parametrization is more on the conservative side of things.
Does this make sense?

Sebastian

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Date: September 11, 2012 7:45:24 PM EDT
To: John M Reilly (b) (6)@mit.edu<mailto:(b) (6)@mit.edu>>
Subject: RE: question on your paper
We seem to be talking past each other.

Your explanation makes sense, but ignores the tax interaction effect. That is, the carbon tax increases final good prices, which in turn lowers real returns to capital and labor. That means that the carbon tax acts as an implicit tax on capital and on labor, adding to the the already large distortions caused by existing taxes on them. Most of the literature finds that the tax interaction effect is 3 to 4 times larger that the direct cost of the carbon tax. Because the carbon tax is, in effect, an implicit tax on both capital and on labor, it can be more efficient than a tax on capital OR than a tax on labor, but it cannot be more efficient than both capital and labor taxes. The only explanation that I can think of that would make this true is if you found that much of the carbon tax was falling on FIXED capital. Does your model differentiate between fixed capital in the energy sector and other types of capital? If so, do you have the ability to determine how much of the carbon tax is borne by that capital?

_____
From: John M Reilly (b) (6)@MIT.EDU<mailto(b) (6)@MIT.EDU>]
Sent: Tuesday, September 11, 2012 5:59 PM
To: Terry Dinan
Subject: Re: question on your paper
Oh--this is the classic issue. The distortion cost per unit change in the tax rate is proportional to how big the initial distortion is. If you start with a good that has virtually not tax--energy in the US. the first incremental increase in the tax is the usual welfare triangle, and the distortion cost is relatively small. But with labor and capital taxation or any other taxes where the marginal tax rate is 25 to 35% or more, the the marginal distortion with the last unit of the tax is not a triangle--it is the combination of a large rectangle and a small triangle--the small triangle is of the order of the energy deadweight loss triangle, but the rectangle is something the energy/carbon tax does not have-it is non-marginal. (And the personal income tax on labor and the payroll tax are both just labor taxes--they are just distributed a little different by income level, but you add them together--along with state level personal income taxes to get the marginal rate on labor. E.g. If my marginal income tax bracket is 30%, the payroll tax is 7%, and my state income tax is 5%, then my marginal tax rate on labor is 42%. It then doesn't matter which of those I cut by, e.g., a percentage point--my marginal tax on labor will fall from 42 to 41%. The tax on labor income and the payroll tax ought to be about the same--the only difference is that on high incomes the payroll tax phases out. So if I am sufficiently above the phase out, cutting the payroll tax by a percentage doesn't affect my marginal tax rate at all but that is generally a small difference and only applicable to the highest incomes.).

So take this example: if labor taxes are $35 dollars on $100 of income, elasticity of labor is .3, then if we reduce labor taxes by $1--or lets say that is 1% of the 100, then we expect labor to increase by .3 units. The reduced deadweight loss will be the rectangle of $34-the length of the remaining tax times the labor change (.3 X $34)= 10.2 + (approximately the triangle 1/2 X $1 X .3)= $.15. So the total reduced deadweight loss is $10.35.

Now contrast that with the added deadweight loss from a carbon tax, starting from 0$ and going to 1$, and lets assume a similar elasticity of .3. The deadweight loss from that change is just the triangle 1/2 X $1 X .3 = $.15.

So the gain from cutting the labor tax is much much greater than the deadweight loss from the carbon tax. $10.35 >>>>$.15.

So you can see in this example, that even if we reserve 25% of the carbon tax revenue for revenue neutrality, and hence can only cut income taxes by $.75 instead of a dollar. The deadweight loss savings is still going to be much greater.

Similarly if the marginal tax on capital is 39%. And here the capital tax is a combination of taxes paid on equity income and the corporate income tax, then the same numerical example is going to hold.

so these are roughly real examples, and just point out how important it is in this calculation where you are starting from. If the initial distortion is very large then a marginal change is going to have a very big effect. Different elasticities can be important, but you can see in this example that even huge differences in the elasticities are not going to overwhelm the huge difference in initial starting point.

Of course as you increase the carbon tax to higher levels the change becomes larger and the deadweight loss grows, and so at some point--- a high enough carbon tax, you will be on the other side of this equation. If the carbon tax is up to 50%, then you will have a similar huge deadweight loss from the additional increase --going from $50 to $51. The deadweight loss will be $50X.3 + 1/2 X $1X.3 = $15.15. So by this point the total marginal deadweight loss from the carbon tax is greater than reduce deadweight loss from the reduction in labor or capital taxes.

So exactly because all of these existing tax rates are much higher (and of similar magnitude) than that tax rate on energy/carbon, we should expect these to all have very similar effects. If a cut of one these had a benefit and the other did not--that would be bizarre.

Of course with the carbon tax of $20 per ton and rising--that is already probably a 20% tax on coal, we are probably in the study eventually to a point where a further marginal increase in the carbon tax rate is actually welfare reducing--but we are not comparing marginal changes, and it turns out by coincidence that this particular rate, given energy prices and how they are changing, is just about at the point where if we raised a bit more, the total welfare effect would turn negative. I.e the marginal effect of raising the tax from $19 to $20 probably already quite negative, but it is not enough to offset the huge benefits associated with going from $0 to $1, $1 to $2, etc.

There are other complex interactions going on in a CGE model but the simple arithmetic above is going to dominate things when there is this huge difference in initial tax rates. I should note that in a paper in JEEM around 2003--Babiker, Metcalf, Reilly--we did find that for Europe the adding the carbon tax their and cutting taxes led to the result that this reduce welfare further, because there the gasoline taxes were already so high, that this change further worsened the relative price distortion between energy and capital and labor. So it can go both ways, but it depends largely on the initial level of taxes in the two markets you are comparing.

John

On Sep 11, 2012, at 4:54 PM, Terry Dinan wrote, e.g.,

My problem is that I can understand how a carbon tax could be more distorting than capital taxes, personal income taxes or labor taxes, but not more distorting than ALL THREE. That is, since the carbon tax exacerbates the distortions caused by ALL of those existing taxes, it must be LESS distortionary than at least one of them, so not all three tax swaps can improve welfare. E.g., suppose that 50 percent of the carbon tax falls on labor and 50 percent falls on capital and that labor supply is

more inelastic than the supply of capital. In that case a carbon tax could improve welfare only if it was used to reduce capital taxes but not if it was used to reduce labor taxes.

From: John M Reilly [mailto:(b) (6)@MIT.EDU]
Sent: Tuesday, September 11, 2012 4:13 PM
To: Terry Dinan
Subject: Re: question on your paper

It is a tax swap. If it were just the carbon tax and a lump sum recycle, there would be a cost. By reducing capital and labor taxes, it is avoiding some of the distortions those cause and those avoided distortions are offsetting the direct cost of the carbon tax.

On Sep 11, 2012, at 3:55 PM, Terry Dinan wrote:

John,

Thanks for getting back to me and for clearing up the confusion about the CT Transfer scenario.

I did look at the attached article by Don and Gib, which, although old, was an interesting summary of much of the early literature. The Bovenberg and Goulder paper that you referred to, and which Don and Gib's paper references, finds that a carbon tax is more distortionary than personal income taxes, thus in the absence of an environmental benefit, the carbon tax would reduce welfare.

I asked Larry if he had any ideas about why you find that a carbon tax swap improves welfare (not accounting for the environmental benefits) regardless of whether the revenue is used to cut payroll, personal income or capital taxes. (As I said before, I can understand why one of those swaps might be welfare enhancing, but not all of them.) Larry was a little confused about it as well and thought that it must be the case that the carbon tax is avoiding some distortion that the other taxes are creating, but that he didn't know what that might be. Could it be the case that your model has some portion of the carbon tax falling on fixed capital (that is, acting as a lump sum tax)? In that case, I could see how you could get the results that you do.

Thanks for your help in understanding this. My questions are not intended to imply that your results are wrong, just trying to be sure that I understand what drives them. This is particularly important since they differ from other people's findings (I don't know of anyone else that finds all tax swaps produce a strong double dividend) and may receive attention on the Hill.

Take care,

Terry

From: John M Reilly [mailto:j(b) (6)@MIT.EDU]
Sent: Tuesday, September 11, 2012 11:07 AM
To: Terry Dinan
Cc: Rausch Sebastian (b) (6) @ethz.ch<mailto(b) (6) @ethz.ch>)
Subject: Re: question on your paper

I was traveling for a few days and just got back to this.

The Goulder paper I had in mind was the following: Bovenberg, A. L., and L. H. Goulder, 1996: Optimal environmental taxation in the presence of other taxes: general equilibrium analyses. American Economic Review 86: 985-1000. ...but it does seem a bit confusing and is really directly dealing with the double dividend story although it is implicit in comparisons of the optimal tax dependence on what you do with the revenue.

The attached PDF of a paper by Fullerton and Metcalf reviews the issue generally and tries to boil it down to an easier to understand story.

Also I have now checked with Sebastian and the case with transfers is revenue neutral...there is no tax cut, and revenue from the carbon tax is used to make up any loss in revenue. Unfortunately the passage you called out is misworded. I believe originally this passage was meant to say. Why are there benefits from full use of the funds (for tax cuts). (As opposed to those cases where 1/2 are used for an ITC). Somehow this got edited to be full transfers instead of full use of the funds . And then in a very last edit someone went through and added the (CT Transfer label) to make it clear--but clearly wrong. The CT-Transfers case is explained, in the "third" par to this explanation. We will go back and correct the text here..and update the report. THanks for pointing this out.

Third, why is welfare higher when revenue is used for social programs? This occurs because it is a transfer of income from relatively higher income households to relatively lower income households. Higher income households save a larger percentage of their income and so in these transfer cases there is more consumption and welfare is thus higher. Eventually, the reduced savings and investment reduces capital stock and the amount of goods that the economy can produce. Thus, while welfare is higher in early years when carbon tax revenue is devoted to social programs it falls below the other cases in later years.

On Sep 6, 2012, at 9:52 AM, Terry Dinan wrote:

Thanks for your quick response John. I'm still puzzling a bit about a few things. Could you please take a look at my questions inserted below? Terry

From: John M Reilly [mailto(b) (6)@MIT.EDU]
Sent: Wednesday, September 05, 2012 5:45 PM
To: Terry Dinan
Cc: Rausch Sebastian (b) (6) @ethz.ch<mailto(b) (6) @ethz.ch>)
Subject: Re: question on your paper

On Sep 5, 2012, at 4:05 PM, Terry Dinan wrote:

Hi John and Sebastian,

I was hoping that you could help me understand some of the findings of your carbon tax analysis.

First, I'm wondering how your model apportions a carbon tax across capital and labor. Regardless of whether the tax is passed forward (resulting in higher prices) or backwards (reducing returns to labor and capital) the carbon tax lowers real returns to capital and labor, correct? What share of the carbon tax falls on labor and what share on capital?

That is kind of a complex issue. Typically people try to decompose to see price and income effects, but in a CGE you choose a numeraire good and so what is price and what is income depends on choice of numeraire so what happens to wages and rate of return on capital depends on what your numeraire is. If you chose wage rates as the numeraire then by definition there would be no change in the wage. We choose the price of welfare to be the numeraire, so that is somewhat unbiased because it is the average price of everything consumed. Butwith CGE you need to look at sources and uses. We did some diagnoses of source and use effects in an earlier paper--see below. I think that to the extent we could tease it out, the proportional impact on capital and labor are pretty similar. The big issue that surprised us is that with revenue neutrality in absolute terms, government payments and transfer are fixed and so those sources of income are by definition completely insulated from any change...And in reality these program benefits are indexed to inflation. So it wasn't that low income households were not being hurt as much because wages were less affected than capital returns, but rather than low income households derive on average a lot of their income from transfers...a lot of this is social security payments.
Reprint 2010-9.
Distributional Implications of Alternative U.S. Greenhouse Gas Control

Measures<http://globalchange.mit.edu/research/publications/2077>

Rausch, S., G.E. Metcalf, J.M. Reilly and S. Paltsev The B.E. Journal of Economic Analysis & Policy<http://www.bepress.com/bejeap/vol10/iss2/art1> 10(2): Article 1. [abstract<http://globalchange.mit.edu/research/publications/2077>] [Full article available at publisher's website<http://www.bepress.com/bejeap/vol10/iss2/art1>] (Supersedes Report 185<http://globalchange.mit.edu/research/publications/reprints/abstract.php?publication_id=2065>)

Also, I'm puzzling about how you can find that all of the cases that you consider lead to welfare gains (with the exception of 2015 for the 3 investment cases). Since the carbon tax itself is a distortionary tax---that is it reduces real returns to K and L, thereby reducing the amount of K and L supplied---it seems that it could only improve welfare by replacing a MORE distortionary tax. But you find it improves welfare in all the tax swap cases. How can that be? That is, how can taxes on labor, capital and income all be more distortionary than a carbon tax when a carbon tax is essentially a tax on K and L?

This is a standard finding.. Larry Goulder's work in the mid-1990's illustrated this theoretically and so there is no question you can get this result. Since you can substitute away from energy it is not equivalent to tax on capital and labor. If you are taxing them directly there is no way to substitute away--only investing less or working less--that is the distortionary effect. But, if you tax energy, then you can "avoid it" by using less....and getting less emissions. If there were no substitution between energy and capital and labor, then I think your conclusion would be correct.

I understand that you can avoid the carbon tax, but if you are raising the same amount of revenue w/a carbon tax versus another tax, then the extent to which you're avoiding the tax is already taken into account. Could you please direct me to the article that you had in mind? Unless I'm misreading it, Larry's JEEM article from that time makes a pretty strong case that carbon tax is more distortionary than any existing taxes, so that it is not possible to make a welfare improving tax swap. See Tables II and III and associated text in: http://ac.els-cdn.com/S0095069685710479/1-s2.0-S0095069685710479-main.pdf?_tid=286a90ea-f820-11e1-a7dd-00000aab0f02&acdnat=1346935459_e8d9288f729c1fbd71a38de16f5eaa08

I'd really like to understand this better.

Finally, I'm confused by your Transfers case. It seems that this is actually a tax swap case, that is, it seems like the carbon tax is simply replacing the other tax(es) that funded the transfer payments. Either way, transfers are held constant. Am I missing something? What taxes were funding the transfers that were then replaced by the carbon tax?

Good question..Sebastian. In this case, I assume Gov is going up by the amount of the transfers. Is that true? If so, then our description is misleading in that I say that all the cases are revenue neutral, where obviously in that case it is not.

This is confusing in the text. The policy is described as using a carbon tax to fund transfers (implying a net increase in transfers) but the explanation of why it yields a positive welfare effect makes it sound like it was really a tax swap. From p. 7:

"First, why are there positive net benefits in the full transfer (CT Transfer) case? Here we are seeing the tax interaction effect we noted in the introduction, originally described by Bovenberg and Goulder (1996). Use of the carbon tax revenue to cut distortionary taxes used to fund these transfers reduces the drag they place on the economy enough to more than offset the cost of the carbon tax. Thus we see the economic benefit of raising revenue through a carbon tax as opposed to increases in personal income, corporate income, or payroll taxes."

If it would be easier to discuss this via phone, please feel free to call me.

Thanks for your help in understanding this.

Terry

Terry M. Dinan
Senior Advisor
Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>
(202)226-2927

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Prof. Dr. Sebastian Rausch

Professor of Economics / Energy Economics

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Room ZUE E7

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CH-8032 Zürich

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(b) (6) @ethz.ch<mailto(b) (6) @ethz.ch>

From:	Metcalf, Gilbert
To:	Hall, Daniel
Cc:	Jaffe, Judson
Subject:	RE: Information on Korea"s carbon trading legislation
Date:	Friday, June 08, 2012 6:17:00 PM

Daniel,
(b) (5) [redacted] Glad to know I hadn't misplaced a briefer on the new tax.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Hall, Daniel
Sent: Friday, June 08, 2012 4:19 PM
To: Metcalf, Gilbert
Cc: Jaffe, Judson
Subject: FW: Information on Korea's carbon trading legislation

Gib,

I had reached out last month to my counterpart in Korea's finance ministry to get additional details on their carbon trading proposal and had not received a further response, so I pinged her again today (below).

(b) (5) [redacted]

Here's a brief summary I found from Jake Schmidt at NRDC, note that he also qualifies these as "the latest draft regulations":
http://switchboard.nrdc.org/blogs/jschmidt/south_korean_government_approv.html

Daniel

-----Original Message-----
From: Hall, Daniel
Sent: Friday, June 08, 2012 3:54 PM
To: ' '; (b) (6) [redacted] @gmail.com
Cc: Jaffe, Judson
Subject: RE: Information on Korea's carbon trading legislation

Semna,

I wanted to circle back and find out if there is an update with Korea's carbon trading legislation. What is the most recent progress of the bill? Did your colleagues have an English-language summary (or copy of the legislation) they were able to pass on?

Thanks,
Daniel

_____
Daniel Hall
U.S. Department of the Treasury
Phone: (202) 622-7801
Fax: (202) 622-6728
Email: daniel.hall@treasury.gov

-----Original Message-----
From: [mailto:(b) (6) @mosf.go.kr]
Sent: Monday, May 07, 2012 8:37 PM
To: Hall, Daniel; semnalee@gmail.com
Cc: Jaffe, Judson
Subject: Re: Information on Korea's carbon trading legislation

Hi, Daniel.
My understanding regarding Korean carbon trading legislation is that the law aiming to introduce the carbon trading system in 2015 is now pending in Parliament. (If it was already passed, I should have known it!) Since this law is being charged in by the Ministry of Environment, I'm not sure whether I can get any documents to pass on to you. I'll contact the Ministry of Environment and ask around.
Have a nice day!

Semna
--- Original Message ---
From : Daniel.Hall@treasury.gov
To : (b) (6) @mosf.go.kr,(b) (6) @gmail.com Cc : Judson.Jaffe@treasury.gov Date : 2012/05/07 11:11:47 Subject : Information on Korea's carbon trading legislation

.EmailQuote {
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Semna,

I hope you are well. My colleagues here at the US Treasury are interested to learn more about the carbon trading legislation that was recently passed by the Korean parliament. Do you have a summary of the bill (e.g., a fact sheet) or an English-language copy of the legislation that you could pass on to us?

Many thanks,
Daniel

_____
Daniel Hall
Office of Environment and Energy
U.S. Department of the Treasury
Phone: (202) 622-7801
Fax: (202) 622-6728
Email: daniel.hall@treasury.gov

From: Metcalf, Gilbert
To: Jaffe, Judson
Subject: RE: MIT Paper
Date: Thursday, September 13, 2012 12:19:00 PM

(b)(5) [redacted]

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Jaffe, Judson
Sent: Thursday, September 13, 2012 9:17 AM
To: Metcalf, Gilbert
Subject: RE: MIT Paper

I'll have to take a look at the paper and the back and forth more. But (b)(5) [redacted]

_____

Judson Jaffe
Office of Environment and Energy
U.S. Department of the Treasury
Phone: 202.622.7751
Fax: 202.622.6728
Email: judson.jaffe@treasury.gov

-----Original Message-----
From: Metcalf, Gilbert
Sent: Thursday, September 13, 2012 9:14 AM
To: Jaffe, Judson
Subject: FW: MIT Paper

Terry and I have gone back and forth on this as she has found John Reilly's (b)(5) [redacted]

(b)(5) [redacted]

Plausible to me. Make sense to you?

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury

(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Terry Dinan [mailto:Terry.Dinan@cbo.gov]
Sent: Wednesday, September 12, 2012 10:07 AM
To: Metcalf, Gilbert
Subject: MIT Paper

Hi Gib,

Just wanted to let you know that I really didn't get much further in understanding what's driving the MIT results. John's primary explanation (see below, if you like) is that the carbon tax is less distorting than the other taxes because we don't currently have a tax on energy whereas we have significant taxes on capital, labor and personal income. Based on my understanding of the literature, that would not explain their results because it doesn't account for the tax interaction effect of the carbon tax. I asked him if he thought that it could be the case that the carbon tax is falling on fixed capital in his model, but his answer in not really definitive.

I told you that I'd let you know what I heard from him, so am filling you in even though I don't really have any answers. Please let me know if you have any further thoughts or insights.

Thanks again for your help with this.

Terry

From: John M Reilly [mailto(b) (6)@MIT.EDU]
Sent: Wednesday, September 12, 2012 8:14 AM
To: Terry Dinan
Subject: Re: question on your paper

To the extent that operates it is in our model. These are relatively complex things.

Sent from my iPhone

On Sep 11, 2012, at 7:45 PM, "Terry Dinan" <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>> wrote:
We seem to be talking past each other.

Your explanation makes sense, but doesn't account for the tax interaction effect. That is, the carbon tax increases final good prices, which in turn lowers real returns to capital and labor. That means that the carbon tax acts as an implicit tax on capital and on labor, adding to the the already large distortions caused by existing taxes on them. Most of the literature finds that the tax interaction effect is 3 to 4 times larger that the direct cost of the carbon tax. Because the carbon tax is, in effect, an implicit tax on both capital and on labor, it can be more efficient than a tax on capital OR than a tax on labor, but it cannot be more efficient than both capital and labor taxes. The only explanation that I can think of that would make this true is if you found that much of the carbon tax was falling on FIXED capital. Does your model differentiate between fixed capital in the energy sector and other types of capital? If so, do you have the ability to determine how much of the carbon tax is borne by that capital?

_____
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Sent: Tuesday, September 11, 2012 5:59 PM
To: Terry Dinan
Subject: Re: question on your paper
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But with labor and capital taxation or any other taxes where the marginal tax rate is 25 to 35% or more, the the marginal distortion with the last unit of the tax is not a triangle--it is the combination of a large rectangle and a small triangle--the small triangle is of the order of the energy deadweight loss triangle, but the rectangle is something the energy/carbon tax does not have-it is non-marginal. (And the personal income tax on labor and the payroll tax are both just labor taxes--they are just distributed a little different by income level, but you add them together--along with state level personal income taxes to get the marginal rate on labor. E.g. If my marginal income tax bracket is 30%, the payroll tax is 7%, and my state income tax is 5%, then my marginal tax rate on labor is 42%. It then doesn't matter which of those I cut by, e.g., a percentage point--my marginal tax on labor will fall from 42 to 41%. The tax on labor income and the payroll tax ought to be about the same--the only difference is that on high incomes the payroll tax phases out. So if I am sufficiently above the phase out, cutting the payroll tax by a percentage doesn't affect my marginal tax rate at all but that is generally a small difference and only applicable to the highest incomes.).

So take this example: if labor taxes are $35 dollars on $100 of income, elasticity of labor is .3, then if we reduce labor taxes by $1--or lets say that is 1% of the 100, then we expect labor to increase by .3 units. The reduced deadweight loss will be the rectangle of $34-the length of the remaining tax times the labor change (.3 X $34)= 10.2 + (approximately the triangle 1/2 X $1 X .3)= $.15. So the total reduced deadweight loss is $10.35.

Now contrast that with the added deadweight loss from a carbon tax, starting from 0$ and going to 1$, and lets assume a similar elasticity of .3. The deadweight loss from that change is just the triangle 1/2 X $1 X .3 = $.15.

So the gain from cutting the labor tax is much much greater than the deadweight loss from the carbon tax. $10.35 >>>>$.15.

So you can see in this example, that even if we reserve 25% of the carbon tax revenue for revenue neutrality, and hence can only cut income taxes by $.75 instead of a dollar. The deadweight loss savings is still going to be much greater.

Similarly if the marginal tax on capital is 39%. And here the capital tax is a combination of taxes paid on equity income and the corporate income tax, then the same numerical example is going to hold.

so these are roughly real examples, and just point out how important it is in this calculation where you are starting from. If the initial distortion is very large then a marginal change is going to have a very big effect. Different elasticities can be important, but you can see in this example that even huge differences in the elasticities are not going to overwhelm the huge difference in initial starting point.

Of course as you increase the carbon tax to higher levels the change becomes larger and the deadweight loss grows, and so at some point--- a high enough carbon tax, you will be on the other side of this equation. If the carbon tax is up to 50%, then you will have a similar huge deadweight loss from the additional increase --going from $50 to $51. The deadweight loss will be $50X.3 + 1/2 X $1X.3 = $15.15. So by this point the total marginal deadweight loss from the carbon tax is greater than reduce deadweight loss from the reduction in labor or capital taxes.

So exactly because all of these existing tax rates are much higher (and of similar magnitude) than that tax rate on energy/carbon, we should expect these to all have very similar effects. If a cut of one these had a benefit and the other did not--that would be bizarre.

Of course with the carbon tax of $20 per ton and rising--that is already probably a 20% tax on coal, we are probably in the study eventually to a point where a further marginal increase in the carbon tax rate is actually welfare reducing--but we are not comparing marginal changes, and it turns out by coincidence that this particular rate, given energy prices and how they are changing, is just about at the point where if we raised a bit more, the total welfare effect would turn negative. I.e the marginal effect of raising the tax from $19 to $20 probably already quite negative, but it is not enough to offset the huge benefits associated with going from $0 to $1, $1 to $2, etc.

There are other complex interactions going on in a CGE model but the simple arithmetic above is going to dominate things when there is this huge difference in initial tax rates. I should note that in a paper in JEEM around 2003--Babiker, Metcalf, Reilly--we did find that for Europe the adding the carbon tax their and cutting taxes led to the result that this reduce welfare further, because there the gasoline taxes were already so high, that this change further worsened the relative price distortion between energy and capital and labor. So it can go both ways, but it depends largely on the initial level of taxes in the two markets you are comparing.

John

On Sep 11, 2012, at 4:54 PM, Terry Dinan wrote, e.g.,

My problem is that I can understand how a carbon tax could be more distorting than capital taxes, personal income taxes or labor taxes, but not more distorting than all three. That is, since the carbon tax exacerbates the distortions caused by ALL of those existing taxes, it must be LESS distortionary than at least one of them, so not all three tax swaps can improve welfare. E.g., suppose that 50 percent of the carbon tax falls on labor and 50 percent falls on capital and that labor supply is more inelastic than the supply of capital. In that case a carbon tax could improve welfare only if it was used to reduce capital taxes but not if it was used to reduce labor taxes.

From: John M Reilly [mailto:(b) (6)@MIT.EDU]
Sent: Tuesday, September 11, 2012 4:13 PM
To: Terry Dinan
Subject: Re: question on your paper

It is a tax swap. If it were just the carbon tax and a lump sum recycle, there would be a cost. By reducing capital and labor taxes, it is avoiding some of the distortions those cause and those avoided distortions are offsetting the direct cost of the carbon tax.

From:	Tonkonogy, Bella
To:	Metcalf, GilbertDisabled; Demopulos, Abigail
Cc:	Lien, Elizabeth; Urbanas, Elizabeth (Beth)Disabled
Subject:	RE: ML strategy memo
Date:	Tuesday, June 12, 2012 9:27:34 AM
Attachments:	InfoMemo-ML_privatesectorstrategy_031612_v4.docx

Here you go. It's in March Chron file now.

From: Metcalf, Gilbert
Sent: Tuesday, June 12, 2012 9:21 AM
To: Demopulos, Abigail
Cc: Lien, Elizabeth; Urbanas, Elizabeth (Beth); Tonkonogy, Bella
Subject: ML strategy memo

I went to pull up the strategy memo to ML on private sector engagement that we discussed at staff meeting yesterday and could not find it in the chron file or GCF folder. Can someone point me to it in our E&E folder or send me a copy.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Demopulos, Abigail
Sent: Monday, June 11, 2012 6:08 PM
To: Metcalf, Gilbert
Cc: Lien, Elizabeth; Urbanas, Elizabeth (Beth); Tonkonogy, Bella
Subject: For review - private sector facility concept paper

Gib:

Attached is the famous concept paper for your review with input from me, Bella and Elizabeth and cleared by Beth. Also attached is a picture of the facility and a plan for how we will solicit feedback – to be discussed on Wednesday.

Best,

Abby Demopulos
622-5671

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C.

March 16, 2012

INFORMATION MEMORANDUM FOR ASSISTANT SECRETARY LAGO

FROM: Gilbert E. Metcalf
Deputy Assistant Secretary, Office of Environment and Energy

SUBJECT: Private Sector Engagement Strategy

Summary: Developed countries committed at the 2009 UN climate negotiations in Copenhagen to mobilize jointly $100 billion annually in climate finance for developing countries by 2020. Given the increasingly scarce public funding for climate finance, reaching that goal will require effectively leveraging private climate finance through the careful use of public funds. Multiple USG efforts are underway to understand how we can best use bilateral institutions (e.g. OPIC) and multilateral institutions and funds (e.g. GEF, CIFs, and GCF) to help achieve this goal. In an effort to bring some systematic analysis to the problem, the E&E office has developed a private sector strategy and work plan for 2012 to develop a clear, consistent vision for multilateral institutions and funds in leveraging private climate finance.

Background: While the issue of leveraging private finance in climate change has been on the international climate agenda for a number of years, the issue has gained visibility and interest in recent years, due to several factors: 1) a commitment made at the Copenhagen climate negotiations in 2009 to mobilize jointly $100 billion of climate finance annually from developed to developing countries by 2020; 2) the lack of a global price on carbon to directly incentivize private sector participation in clean energy; and 3) an increasing gap between the need for climate mitigation and adaptation funding and the availability of public funds.

While several U.S. agencies have important equities in this topic, including State, USAID, DOE, OPIC, and Commerce, Treasury's comparative advantage is in its role in oversight and design of multilateral funds and institutions, participation in various intergovernmental policy forums, and domestic policy experience.

(NR) [redacted]

From:	Metcalf, Gilbert
To:	Tonkonogy, Bella
Cc:	Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject:	RE: private sector strategy info memo
Date:	Friday, March 16, 2012 4:42:00 PM
Attachments:	(b) (5) [redacted]

I reworked the summary some. Otherwise no significant changes. Thanks very much.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Tonkonogy, Bella
Sent: Friday, March 16, 2012 4:01 PM
To: Metcalf, Gilbert
Cc: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: private sector strategy info memo

Gib,

Attached is the draft info memo you requested regarding our private sector strategy. Beth has cleared. Will send to Him once we have your clearance.

Thanks,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

From:	Metcalf, Gilbert
To:	Das, Himamauli
Cc:	Jaffe, Judson; Hall, Daniel
Subject:	RE: question re legal engagement/domestic matters
Date:	Wednesday, March 28, 2012 4:58:00 PM

Him,
Not sure that there is much domestic enviro work going on that requires legal capacity. (b) (5) [redacted] I'm copying Danile and Jud on this since they do most of our domestic work and they should know about Rob's presence in case issues do come up.
Thanks.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Das, Himamauli
Sent: Wednesday, March 21, 2012 2:25 PM
To: Metcalf, Gilbert
Subject: question re legal engagement/domestic matters

Gib,

We have an excellent new attorney starting on Mar 26 (Monday). Rob McKeehan is currently at WilmerHale, and comes with impressive recommendations and credentials. He has worked on a range of trade and domestic environmental matters at Wilmer, along with other issues

(b) (5) [redacted]

Thanks, Him

Himamauli Das
Assistant General Counsel (International Affairs)
Office of the General Counsel
U.S. Department of the Treasury
Tel: (202) 622-1147
Himamauli.Das@treasury.gov

-----Original Message-----
From: Terry Dinan [mailto:Terry.Dinan@cbo.gov]
Sent: Wednesday, September 12, 2012 12:35 PM
To: Metcalf, Gilbert
Subject: FW: Fwd: question on your paper

Gib,

This response from Sebastian is helpful. It sounds like a significant fraction of the carbon tax is in fact likely to fall on fixed capital in their model. That would explain how they could find that all the tax swaps they look at improve welfare: to the extent that the carbon tax is absorbed by fixed capital, the TIE would shrink, thus, the revenue recycling effect could offset the TIE effect for all three of the tax swaps that they consider (capital, labor and personal income). Do you agree?

Also, I don't actually think the magnitude of the carbon abatement costs can explain the result. Lower abatement costs would imply a smaller TIE (ignoring fixed capital) but would also yield less revenue for revenue recycling, so it doesn't really seem to me that lower abatement costs would, ceteris paribus, make tax swaps more likely to improve welfare. Do you agree?

Thanks,

Terry

From: Rausch Sebastian [mailto:(b) (6) @ethz.ch]
Sent: Wednesday, September 12, 2012 11:40 AM
To: Terry Dinan
Cc: John M Reilly
Subject: Re: Fwd: question on your paper

Terry,

I can fully see your point, and yes the tax interaction effect is important to take into account.

Of course, the issue whether a revenue-neutral carbon tax swap yields a positive welfare change (excluding environmental benefits) is ultimately an empirical question. Even in Goulder's 1995 JEEM paper, he caveats that his analysis does not in general preclude the possibility of a welfare-improving carbon tax swap (see page 289). He even mentions in footnote #41 of this paper that his model generates overall positive welfare effects under certain paramter configurations (e.g., with a sufficienctly high intertemporal elasticity of substitution).

In trying to understand what leads to the overall positive welfare effect in our model, I can think of two explanations. First, in each sector a significant fraction of capital in each sector is "fixed" or non-malleable and cannot be moved around in any period of the model (the fraction is around 30% for non-electricity sectors and around 70% for the electricity sector). Second, the cost of carbon abatement itself might smaller as compared to what Goulder has in his model (column 2 in Table II in Goulder's paper). Our model includes a number of advanced energy technologies, including renewable techs. We include, for example, small- and large-scale wind and characterize regional resource potentials based on high-resolution wind data from NREL. And wind in our model contributes significantly to the electricity generation mix under a carbon tax. I would imagine that Goulder results are sensitive with respect to the costs of the backstop technology. His model is not very detailed on the advanced energy techs in that it only includes one single, generic backstop. I would not be surprised if his parametrization is more on the conservative side of things.
Does this make sense?

Sebastian

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Date: September 11, 2012 7:45:24 PM EDT
To: John M Reilly (b) (6)@mit.edu<mailto:(b) (6)@mit.edu>>

Subject: RE: question on your paper
We seem to be talking past each other.

Your explanation makes sense, but ignores the tax interaction effect. That is, the carbon tax increases final good prices, which in turn lowers real returns to capital and labor. That means that the carbon tax acts as an implicit tax on capital and on labor, adding to the the already large distortions caused by existing taxes on them. Most of the literature finds that the tax interaction effect is 3 to 4 times larger that the direct cost of the carbon tax. Because the carbon tax is, in effect, an implicit tax on both capital and on labor, it can be more efficient than a tax on capital OR than a tax on labor, but it cannot be more efficient than both capital and labor taxes. The only explanation that I can think of that would make this true is if you found that much of the carbon tax was falling on FIXED capital. Does your model differentiate between fixed capital in the energy sector and other types of capital? If so, do you have the ability to determine how much of the carbon tax is borne by that capital?

_____
From: John M Reilly (b) (6)@MIT.EDU<mailto(b) (6)@MIT.EDU>]
Sent: Tuesday, September 11, 2012 5:59 PM
To: Terry Dinan
Subject: Re: question on your paper
Oh--this is the classic issue. The distortion cost per unit change in the tax rate is proportional to how big the initial distortion is. If you start with a good that has virtually not tax--energy in the US. the first incremental increase in the tax is the usual welfare triangle, and the distortion cost is relatively small. But with labor and capital taxation or any other taxes where the marginal tax rate is 25 to 35% or more, the the marginal distortion with the last unit of the tax is not a triangle--it is the combination of a large rectangle and a small triangle--the small triangle is of the order of the energy deadweight loss triangle, but the rectangle is something the energy/carbon tax does not have-it is non-marginal. (And the personal income tax on labor and the payroll tax are both just labor taxes--they are just distributed a little different by income level, but you add them together--along with state level personal income taxes to get the marginal rate on labor. E.g. If my marginal income tax bracket is 30%, the payroll tax is 7%, and my state income tax is 5%, then my marginal tax rate on labor is 42%. It then doesn't matter which of those I cut by, e.g., a percentage point--my marginal tax on labor will fall from 42 to 41%. The tax on labor income and the payroll tax ought to be about the same--the only difference is that on high incomes the payroll tax phases out. So if I am sufficiently above the phase out, cutting the payroll tax by a percentage doesn't affect my marginal tax rate at all but that is generally a small difference and only applicable to the highest incomes.).

So take this example: if labor taxes are $35 dollars on $100 of income, elasticity of labor is .3, then if we reduce labor taxes by $1--or lets say that is 1% of the 100, then we expect labor to increase by .3 units. The reduced deadweight loss will be the rectangle of $34-the length of the remaining tax times the labor change (.3 X $34)= 10.2 + (approximately the triangle 1/2 X $1 X .3)= $.15. So the total reduced deadweight loss is $10.35.

Now contrast that with the added deadweight loss from a carbon tax, starting from 0$ and going to 1$, and lets assume a similar elasticity of .3. The deadweight loss from that change is just the triangle 1/2 X $1 X .3 = $.15.

So the gain from cutting the labor tax is much much greater than the deadweight loss from the carbon tax. $10.35 >>>>$.15.

So you can see in this example, that even if we reserve 25% of the carbon tax revenue for revenue neutrality, and hence can only cut income taxes by $.75 instead of a dollar. The deadweight loss savings is still going to be much greater.

Similarly if the marginal tax on capital is 39%. And here the capital tax is a combination of taxes paid on equity income and the corporate income tax, then the same numerical example is going to hold.

so these are roughly real examples, and just point out how important it is in this calculation where you are starting from. If the initial distortion is very large then a marginal change is going to have a very big effect. Different elasticities can be important, but you can see in this example that even huge differences in the elasticities are not going to overwhelm the huge difference in initial starting point.

Of course as you increase the carbon tax to higher levels the change becomes larger and the deadweight loss grows, and so at some point--- a high enough carbon tax, you will be on the other side of this equation. If the carbon tax is up to 50%, then you will have a similar huge deadweight loss from the additional increase --going from $50 to $51. The deadweight loss will be $50X.3 + 1/2 X $1X.3 = $15.15. So by this point the total marginal deadweight loss from the carbon tax is greater than reduce deadweight loss from the reduction in labor or capital taxes.

So exactly because all of these existing tax rates are much higher (and of similar magnitude) than that tax rate on energy/carbon, we should expect these to all have very similar effects. If a cut of one these had a benefit and the other did not--that would be bizarre.

Of course with the carbon tax of $20 per ton and rising--that is already probably a 20% tax on coal, we are probably in the study eventually to a point where a further marginal increase in the carbon tax rate is actually welfare reducing--but we are not comparing marginal changes, and it turns out by coincidence that this particular rate, given energy prices and how they are changing, is just about at the point where if we raised a bit more, the total welfare effect would turn negative. I.e the marginal effect of raising the tax from $19 to $20 probably already quite negative, but it is not enough to offset the huge benefits associated with going from $0 to $1, $1 to $2, etc.

There are other complex interactions going on in a CGE model but the simple arithmetic above is going to dominate things when there is this huge difference in initial tax rates. I should note that in a paper in JEEM around 2003--Babiker, Metcalf, Reilly--we did find that for Europe the adding the carbon tax their and cutting taxes led to the result that this reduce welfare further, because there the gasoline taxes were already so high, that this change further worsened the relative price distortion between energy and capital and labor. So it can go both ways, but it depends largely on the initial level of taxes in the two markets you are comparing.

John

On Sep 11, 2012, at 4:54 PM, Terry Dinan wrote, e.g.,

My problem is that I can understand how a carbon tax could be more distorting than capital taxes, personal income taxes or labor taxes, but not more distorting than ALL THREE. That is, since the carbon tax exacerbates the distortions caused by ALL of those existing taxes, it must be LESS distortionary than at least one of them, so not all three tax swaps can improve welfare. E.g., suppose that 50 percent of the carbon tax falls on labor and 50 percent falls on capital and that labor supply is more inelastic than the supply of capital. In that case a carbon tax could improve welfare only if it was used to reduce capital taxes but not if it was used to reduce labor taxes.

From: John M Reilly [mailto(b) (6)@MIT.EDU]
Sent: Tuesday, September 11, 2012 4:13 PM
To: Terry Dinan
Subject: Re: question on your paper

It is a tax swap. If it were just the carbon tax and a lump sum recycle, there would be a cost. By reducing capital and labor taxes, it is avoiding some of the distortions those cause and those avoided distortions are offsetting the direct cost of the carbon tax.

On Sep 11, 2012, at 3:55 PM, Terry Dinan wrote:

John,

Thanks for getting back to me and for clearing up the confusion about the CT Transfer scenario.

I did look at the attached article by Don and Gib, which, although old, was an interesting summary of much of the early literature. The Bovenberg and Goulder paper that you referred to, and which Don and Gib's paper references, finds that a carbon tax is more distortionary than personal income taxes, thus in the absence of an environmental benefit, the carbon tax would reduce welfare.

I asked Larry if he had any ideas about why you find that a carbon tax swap improves welfare (not accounting for the environmental benefits) regardless of whether the revenue is used to cut payroll, personal income or capital taxes. (As I said before, I can understand why one of those swaps might be welfare enhancing, but not all of them.) Larry was a little confused about it as well and thought that it must be the case that the carbon tax is avoiding some distortion that the other taxes are creating, but that he didn't know what that might be. Could it be the case that your model has some portion of the carbon tax falling on fixed capital (that is, acting as a lump sum tax)? In that case, I could see how you could get the results that you do.

Thanks for your help in understanding this. My questions are not intended to imply that your results are wrong, just trying to be sure that I understand what drives them. This is particularly important since they differ from other people's findings (I don't know of anyone else that finds all tax swaps produce a strong double dividend) and may receive attention on the Hill.

Take care,

Terry

From: John M Reilly [mailto(b) (6)@MIT.EDU]
Sent: Tuesday, September 11, 2012 11:07 AM
To: Terry Dinan
Cc: Rausch Sebastian (b) (6) @ethz.ch<mailto(b) (6) @ethz.ch>)
Subject: Re: question on your paper

I was traveling for a few days and just got back to this.

The Goulder paper I had in mind was the following: Bovenberg, A. L., and L. H. Goulder, 1996: Optimal environmental taxation in the presence of other taxes: general equilibrium analyses. American Economic Review 86: 985-1000. ...but it does seem a bit confusing and is really directly dealing with the double dividend story although it is implicit in comparisons of the optimal tax dependence on what you do with the revenue.

The attached PDF of a paper by Fullerton and Metcalf reviews the issue generally and tries to boil it down to an easier to understand story.

Also I have now checked with Sebastian and the case with transfers is revenue neutral...there is no tax cut, and revenue from the carbon tax is used to make up any loss in revenue. Unfortunately the passage you called out is misworded. I believe originally this passage was meant to say. Why are there benefits from full use of the funds (for tax cuts). (As opposed to those cases where 1/2 are used for an ITC). Somehow this got edited to be full transfers instead of full use of the funds . And then in a very last edit someone went through and added the (CT Transfer label) to make it clear--but clearly wrong. The CT-Transfers case is explained, in the "third" par to this explanation. We will go back and correct the text here..and update the report. THanks for pointing this out.

Third, why is welfare higher when revenue is used for social programs? This occurs because it is a transfer of income from relatively higher income households to relatively lower income households. Higher income households save a larger percentage of their income and so in these transfer cases there is more consumption and welfare is thus higher. Eventually, the reduced savings and investment reduces capital stock and the amount of goods that the economy can produce. Thus, while welfare is higher in early years when carbon tax revenue is devoted to social programs it falls below the other cases in later years.

On Sep 6, 2012, at 9:52 AM, Terry Dinan wrote:

Thanks for your quick response John. I'm still puzzling a bit about a few things. Could you please take a look at my questions inserted below? Terry

From: John M Reilly [mailto(b) (6)@MIT.EDU]
Sent: Wednesday, September 05, 2012 5:45 PM
To: Terry Dinan
Cc: Rausch Sebastian (b) (6) @ethz.ch<mailto(b) (6) @ethz.ch>)
Subject: Re: question on your paper

On Sep 5, 2012, at 4:05 PM, Terry Dinan wrote:

Hi John and Sebastian,

I was hoping that you could help me understand some of the findings of your carbon tax analysis.

First, I'm wondering how your model apportions a carbon tax across capital and labor. Regardless of whether the tax is passed forward (resulting in higher prices) or backwards (reducing returns to labor and capital) the carbon tax lowers real returns to capital and labor, correct? What share of the carbon tax falls on labor and what share on capital?

That is kind of a complex issue. Typically people try to decompose to see price and income effects, but in a CGE you choose a numeraire good and so what is price and what is income depends on choice of numeraire so what happens to wages and rate of return on capital depends on what your numeraire is. If you chose wage rates as the numeraire then by definition there would be no change in the wage. We choose the price of welfare to be the numeraire, so that is somewhat unbiased because it is the average price of everything consumed. Butwith CGE you need to look at sources and uses. We did some diagnoses of source and use effects in an earlier paper--see below. I think that to the extent we could tease it out, the proportional impact on capital and labor are pretty similar. The big issue that surprised us is that with revenue neutrality in absolute terms, government payments and transfer are fixed and so those sources of income are by definition completely insulated from any change...And in reality these program benefits are indexed to inflation. So it wasn't that low income households were not being hurt as much because wages were less affected than capital returns, but rather than low income households derive on average a lot of their income from transfers...a lot of this is social security payments.
Reprint 2010-9.
Distributional Implications of Alternative U.S. Greenhouse Gas Control Measures<http://globalchange.mit.edu/research/publications/2077>

Rausch, S., G.E. Metcalf, J.M. Reilly and S. Paltsev The B.E. Journal of Economic Analysis & Policy<http://www.bepress.com/bejeap/vol10/iss2/art1> 10(2): Article 1.
[abstract<http://globalchange.mit.edu/research/publications/2077>] [Full article available at publisher's website<http://www.bepress.com/bejeap/vol10/iss2/art1>]
(Supersedes Report 185<http://globalchange.mit.edu/research/publications/reprints/abstract.php?publication_id=2065>)

Also, I'm puzzling about how you can find that all of the cases that you consider lead to welfare gains (with the exception of 2015 for the 3 investment cases). Since the carbon tax itself is a distortionary tax---that is it reduces real returns to K and L, thereby reducing the amount of K and L supplied---it seems that it could only improve welfare by replacing a MORE distortionary tax. But you find it improves welfare in all the tax swap cases. How can that be? That is, how can taxes on labor, capital and income all be more distortionary than a carbon tax when a carbon tax is essentially a tax on K and L?

This is a standard finding.. Larry Goulder's work in the mid-1990's illustrated this theoretically and so there is no question you can get this result. Since you can substitute away from energy it is not equivalent to tax on capital and labor. If you are taxing them directly there is no way to substitute away--only investing less or working less--that is the distortionary effect. But, if you tax energy, then you can "avoid it" by using less....and getting less emissions. If there were no substitution between energy and capital and labor, then I think your conclusion would be correct.

I understand that you can avoid the carbon tax, but if you are raising the same amount of revenue w/a carbon tax versus another tax, then the extent to which you're avoiding the tax is already taken into account. Could you please direct me to the article that you had in mind? Unless I'm misreading it, Larry's JEEM article from that time makes a pretty strong case that carbon tax is more distortionary than any existing taxes, so that it is not possible to make a welfare improving tax swap. See Tables II and III and associated text in: http://ac.els-cdn.com/S0095069685710479/1-s2.0-S0095069685710479-main.pdf?_tid=286a90ea-f820-11e1-a7dd-00000aab0f02&acdnat=1346935459_e8d9288f729c1fbd71a38de16f5eaa08

I'd really like to understand this better.

Finally, I'm confused by your Transfers case. It seems that this is actually a tax swap case, that is, it seems like the carbon tax is simply replacing the other tax(es) that funded the transfer payments. Either way, transfers are held constant. Am I missing something? What taxes were funding the transfers that were then replaced by the carbon tax?

Good question..Sebastian. In this case, I assume Gov is going up by the amount of the transfers. Is that true? If so, then our description is misleading in that I say that all the cases are revenue neutral, where obviously in that case it is not.

This is confusing in the text. The policy is described as using a carbon tax to fund transfers (implying a net increase in transfers) but the explanation of why it yields a positive welfare effect makes it sound like it was really a tax swap. From p. 7:

"First, why are there positive net benefits in the full transfer (CT Transfer) case? Here we are seeing the tax interaction effect we noted in the introduction, originally described by Bovenberg and Goulder (1996). Use of the carbon tax revenue to cut distortionary taxes used to fund these transfers reduces the drag they place on the economy enough to more than offset the cost of the carbon tax. Thus we see the economic benefit of raising revenue through a carbon tax as opposed to increases in personal income, corporate income, or payroll taxes."

If it would be easier to discuss this via phone, please feel free to call me.

Thanks for your help in understanding this.

Terry

Terry M. Dinan
Senior Advisor
Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>
(202)226-2927

--

Prof. Dr. Sebastian Rausch

Professor of Economics / Energy Economics

ETH Zurich

Room ZUE E7

Zürichbergstrasse 18

CH-8032 Zürich

tel +(b) (6)

fax +(b) (6)

(b) (6) @ethz.ch<mailto(b) (6) @ethz.ch>

From: Metcalf, Gilbert
To: (b) (6) @rff.org"
Subject: Re: Visit
Date: Saturday, September 22, 2012 3:42:10 AM

Dallas,
Thanks for letting me know. (NR) [redacted]
Best
Gib
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Burtraw, Dallas [mailto(b) (6) @rff.org]
Sent: Friday, September 21, 2012 02:22 PM
To: Metcalf, Gilbert
Subject: RE: Visit

Hi Gib,

(NR) [redacted] I have dedicated a couple years to tooling up on the possibility of implementing GHG rules under the Clean Air Act. Done one way or the other, I feel the cost could vary by a factor of 2, and I'd like to have an influence on that outcome. Ultimately I think we will move to a price on carbon, but in the meantime I feel more certain that we will have regulations and done right I see that those regulations are an on-ramp to a broader price on carbon that could emerge partially through the regulatory process and ultimately through a legislative one.

(NR) [redacted]

Sincerely,
-Dallas

-----Original Message-----
From: Gilbert.Metcalf@treasury.gov [mailto:Gilbert.Metcalf@treasury.gov]
Sent: Tuesday, September 18, 2012 10:26 AM
To: Burtraw, Dallas
Subject: Visit

Dallas,
(NR) [redacted]

(NR) [redacted]

Best,
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

From: Metcalf, Gilbert
To: (b) (6) @fin.dep.no"
Subject: Re:
Date: Wednesday, September 19, 2012 3:24:39 PM

Maybe tomorrow. I just arrived in Venice and am exhausted. Spent 3 days on gcf host country evaluation committee work. Then flew to Europe.

When's a good time tomorrow?
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: Lund, Kjetil [mailto(b) (6) @fin.dep.no]
Sent: Wednesday, September 19, 2012 01:15 PM
To: Metcalf, Gilbert
Subject:

Do u have 1 min for a question about US carbon tax?
Levert til deg med DME mobil e-post fra Finansdepartementet.

From: Metcalf, Gilbert
To: Jaffe, Judson; Hall, Daniel
Cc: Carlson, Curtis
Subject: FW:
Date: Wednesday, May 16, 2012 9:19:00 AM
Attachments: CH0_Metcalf_v2.docx

This is something I did before coming to Treasury on carbon taxes. Welcome reactions if you have any.

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Carbon Taxes

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Carbon Taxes

1. Introduction

A carbon tax is a tax on greenhouse gas emissions. The purpose of a carbon tax is to internalize externalities associated with anthropogenic climate change. Without a carbon tax, individuals face a distorted set of prices. Activities that result in greenhouse gas emissions are relatively too cheap because individuals will not consider the costs the emissions impose on others, including on future generations. A tax forces individuals to consider the full set of consequences from emissions. A carbon tax is an example of a Pigouvian tax, and a carbon tax or an equivalent property rights system such as a cap and trade system, is necessary for market outcomes to be optimal.

The central issues in the design of a carbon tax are (1) the tax rate including adjustments to the rate over time, (2) the tax base, particularly the extent to which it should apply to emissions of greenhouse gases other than carbon dioxide from fossil fuel combustion (3) the place of imposition of the tax (such as directly on emissions or on the embedded greenhouse gas inputs used in production), and (4) the treatment of trade in energy-intensive goods. We begin with a review of existing or proposed carbon taxes and then review each of the central issues in the design of a carbon tax. Finally, we consider the incidence of carbon taxes and briefly review the choice between a carbon tax and a cap and trade system.

2. Carbon Taxes in Practice

Neither the United States nor the rest of the world makes any significant use of taxes explicitly on carbon. As of 2011, only six countries explicitly taxed carbon, the five Scandinavian countries and the United Kingdom. There were also a number of sub-national regimes (such as the carbon taxes in British Columbia and Quebec). There are, however, a wide variety of taxes on, and subsidies for, energy (as well as a wide variety of regulatory regimes for GHGs). For example, the EU, in its 2003 Energy Tax Directive, requires specified taxes on fuel uses of energy. Although not designed to set a uniform price for carbon

across different types of energy, energy taxes and subsidies will undoubtedly affect carbon emissions. The EU Energy Tax Directive, for example, is often thought of as part of the EU's emissions reduction policy.

The Scandinavian countries adopted carbon taxes in the 1990s. These taxes have narrow bases and do not impose a uniform tax on emissions from the sources that they do cover. Instead, they provide a wide variety of different rates.

Finland was the first country to impose a carbon tax in 1990 as a surtax on the carbon content of fossil fuels. The rate in 2011 was €50 per ton CO_2 for motor vehicle fuels and €30 per ton CO_2 for heating fuels. The tax is bundled with an energy tax and a strategic stockpile fee. For example the total tax on gasoline is €0.627 per liter of which €0.504 is an energy component, €0.117 the carbon tax, and €0.007 the strategic stockpile fee.

The Scandinavian carbon taxes are incomplete in coverage. The Norwegian carbon tax, for example, covers about 64% of CO_2 emissions and 49% of total GHG emissions. The impact of the tax is weakened by numerous exemptions related to competitiveness concerns. Moreover, the tax does not accurately reflect variations in emissions across fuels. Finally, even though the Scandinavian countries are relatively similar and each adopted a carbon tax, they differed considerably in what they included in the tax base and what tax rate they applied to different sectors. This makes it difficult for these neighboring countries to harmonize their taxes.

The Netherlands enacted a carbon tax in 1990. In 1992, this tax was replaced with a tax on energy. Currently they do not have a carbon tax per se but have a tax on coal at the rate of €12.95 per metric ton of coal manufactured or imported into the country. They also have an energy tax that is designed to reduce energy consumption and CO_2 emissions.

The United Kingdom instituted a climate tax (known as the climate change levy or "CCL") in 2001. The levy is imposed on industrial and commercial use of energy, and excludes transportation and

domestic (residential) use. The rate is currently modest. For example, electricity is charged as £4.85 per megawatt hour ("MWh"). Natural gas is taxed at £1.69 per MWh. Strictly speaking these are not carbon taxes as the rate is not directly tied to carbon emissions associated with the use of the fuel. For electricity production in the UK produced by bituminous coal, the tax rate on electricity corresponds to a carbon tax of £5.34 per ton of carbon dioxide whereas the tax on natural gas corresponds to a carbon tax rate of £4.01. Moreover, taxpayers can enter into agreements with the government to reduce emissions in exchange for a significantly reduced rate of tax, effectively converting the climate change levy into a command and control regulation. Total collections from the levy are around £700 million ($1.1 billion) annually.

British Columbia passed a carbon tax in 2008 that applies to fossil fuels purchased or used in the Canadian province. It began at a level of C$10 per ton CO_2 with annual increases of C$5 per ton per year planned until it reaches C$30 in 2012. The rate on July 1, 2010 is C$20 per ton CO_2. The tax collects roughly C$500 million annually with revenues earmarked for personal and business income tax reductions along with assorted other tax reductions.

Quebec implemented its carbon tax in October 2007 at an initial rate of C$3.50 per ton of CO_2. The rate is adjusted annually to achieve a revenue target of C$200 million per year over six years to fund a $1.2 billion Green Fund. This fund supports initiatives that reduce greenhouse gas emissions and improves public transportation.

A number of countries have proposed carbon taxes in recent years. President Nicolas Sarkozy proposed a carbon tax in 2009 for France. He proposed a tax set at a rate of €17 per ton of CO_2 to be levied on fossil fuels. Fuels used for electricity generation would be exempt from the tax since they were already covered under the EU Emissions Trading Scheme. The tax met with strong opposition from political opponents and the public and was quickly abandoned by the French president.

Australia's Prime Minister Julia Gillard proposed in February 2011 to implement a carbon tax to begin in July 2012. No tax rate has been set as of May 2011 but the Australian Climate Change Minister announced over half the tax proceeds would be returned to households in some fashion. The remaining revenues would be used to address climate change issues and help the business sector shift to cleaner forms of energy. According to a document from the Multi-Party Climate Change Committee, the base of the tax would be quite comprehensive covering stationary energy sources, transport, industrial processes, and fugitive emissions. The agricultural sector would be exempt from the tax. A separate Carbon Farming Initiative focuses on carbon reductions in the agricultural sector.

South Africa is considering a carbon tax as part of its initiative to reduce greenhouse gas emissions by 34 percent below 2005 levels by 2020 as announced at Copenhagen in 2010. In late 2010 the National Treasury released a Carbon Tax Discussion Paper to describe different ways the tax could be implemented. No decision on whether and how to implement a carbon tax has been made. The press release announcing the discussion paper noted that in 2008 South Africa had implemented a 2¢ per kWh tax on electricity generation which the release characterized as the "first explicit carbon tax to be implemented in South Africa." While not precisely accurate, coal does account for roughly 85 percent of generating capacity in the country and presumably a higher share of actual generation.

Finally, the European Union has announced plans for a carbon tax as part of its ambitious goal to reduce greenhouse gas emissions by 20 percent by 2020. The EU Emissions Trading Scheme (ETS) currently covers the electricity sector and some carbon intensive industries which together are responsible for roughly half of the EU's carbon dioxide emissions. The tax would be applied to transport and home heating fuels to extend carbon pricing to nearly all of the EU's carbon emissions. The EU plan would set minimum energy taxes throughout the EU comprised of two components. The first is a carbon levy initially set at €20 per ton of CO_2 with the tax rate linked to the price of carbon in the ETS trading system. The other component of the tax is an energy tax based on fuel density. This would replace

current energy taxes that are based on volume and which discriminate against biofuels which have less energy per unit of volume than does gasoline or diesel.

3. Design Issues

We focus on four major design issues here: setting the tax rate; identifying which gases and sectors are subject to the tax; where the tax should be imposed; and international trade issues. We note in passing that most if not all of these issues are relevant for other market based instruments including cap and trade systems. Metcalf and Weisbach discuss these issues in greater detail.

Tax Rate

At the most basic level, the principles for setting the correct tax rate were established long ago by Pigou: at any given level of emissions, the tax rate should equal the social marginal damages from producing an additional unit of emissions (otherwise known as the social cost of carbon). A caveat to this prescription is that the rate may need to differ from the social cost of carbon in the presence of market distortions. The extent to which, and even the direction of an adjustment to carbon taxes for market distortions, depends on subtle factors, such as whether there are pre-existing regulatory regimes and the use of the revenues, rather than a priori economic reasoning. For example, carbon taxes themselves may reduce labor supply much the same way as a labor tax and, therefore, substituting this tax for a labor tax may not reduce such distortions. Regardless of the details of this debate, given the heroic assumptions needed to compute the optimal carbon tax rate, second best optimal design considerations are to a large extent second order – determining the carbon tax rate at this point involves guessing about orders of magnitude and not about potentially subtle adjustments.

Estimates of the social cost of carbon vary widely. The calculation is difficult because it involves combining uncertain science, including predictions of the local effects of climate change, with predictions about economic and technological developments in the distant future. In addition, all of these values must be discounted to the present. The Intergovernmental Panel on Climate Change

("IPCC") surveys 100 different studies of the optimal tax rate and estimates a mean for 2005 of $12 per metric ton of CO_2, but notes that estimates range from $3 to $95 per metric ton. The report adds that these figures are likely to underestimate the costs of carbon emissions because of the difficulty in quantifying many impacts. A recent analysis done by the US Interagency Working Group on Social Cost of Carbon provides estimates of the social cost of carbon in 2015 ranging from a mean value of $5.70 assuming a 5 percent discount rate to $72.80 assuming a 3 percent discount rate but based on the 95th percentile of the distribution of social costs based on a Monte Carlo analysis of known uncertainties in parameter values. The Congressional Budget Office estimated that a tax at the rate of $20 per ton of CO_2 levied on energy related carbon dioxide emissions would raise in the neighborhood of $140 billion annually.

The optimal tax rate will vary over time. In a welfare maximizing framework where the benefits and costs of carbon abatement are both taken into account the tax rate should match social marginal damages across time. Where the goal is to cap emissions at some fixed amount over a set time period, the tax rate should grow at the rate of return on capital. Metcalf, and co-authors develop the argument as follows. They start by imagining that we issued permits instead of taxes, issuing today the set of permits that can be used over time. The permits would be an asset. Holders would save that asset for later use if its value went up faster than the rate of return on other assets and use it sooner if its value when up slower. In equilibrium, therefore permit prices will increase at the same rate as the return on other forms of capital. Taxes and permits, however, are merely substitute methods of imposing the Pigouvian price on emissions in the absence of uncertainty. Therefore, if permits optimally have this price pattern, taxes must as well.

Tax Base

Absent administrative, enforcement, and political costs, an ideal carbon tax would include all activities that produce climate externalities. This includes emissions of all GHGs from any activity,

including not only energy usage but also agriculture, forestry, and industrial emissions. Moreover, absent administrative costs, the tax would include not only emissions of gases but also any climate forcing (i.e., any activity that causes a change in the climate), such as changes to albedo caused by forestry activities.

There are, however, hundreds of sources of GHGs, most of them very small contributors. Moreover, many sources of emissions may be hard to measure and tax. To determine the optimal tax base, the administrative savings of a narrow base must be compared to the efficiency benefits of a broad base. In particular, the tax base should be set so that the benefit of a small expansion in the base is equal to the increase in administrative or compliance costs. One can think of broadening the tax base as adding more potential sources of abatement, some of which may have marginal abatement costs lower than those of emitters already included in the tax base. These new sources create the possibility of a lower aggregate cost to achieve any given aggregate amount of abatement.

There is also a set of complicated political considerations. Adding items to the tax base increases the number of special interests that will oppose the tax. At the same time broadening the base allows the tax rate to be lower overall, thereby possibly reducing opposition from those already in the base.

A final tax base issue is whether to tax GHGs on the basis of where the products giving rise to emissions are produced (an origin basis) or where the products are consumed (a destination basis). This distinction matters where trade is involved.

Fossil fuels made up approximately 80% of all U.S. emissions in 2009. Most developed countries have a similar profile. Developing countries will tend to have higher emissions from agriculture and deforestation, so considerations of how to include those activities in the tax base will be more important for developing countries.

Point of Enforcement

There are two principles, one physical and one economic, which allow the collection and enforcement costs for a tax on emissions from fossil fuels to be relatively low. The first is that a unit of fossil fuel will emit the same amount of carbon regardless of when or where it is burned. For carbon emissions from fossil fuel combustion, there is an almost perfect correspondence between input and output. Therefore, it is possible to tax the input – the fossil fuel – rather than the output – the emission. You would, however, want to allow a credit for carbon that is captured and permanently sequestered in some fashion.

The second principle is that the incidence of a tax and its efficiency effects are unrelated to the statutory obligation to remit the tax. This means that, in deciding where to impose the tax (choosing the remitting entity), one can focus on minimizing collection and monitoring costs while ensuring maximum coverage. In general, imposing the tax upstream (i.e., at the earliest point in the production process) will achieve these goals because (1) there are far fewer upstream producers than there are downstream consumers and (2) the cost will be lower per unit of tax due to economies of scale in tax administration.

To illustrate, there are approximately 146 petroleum refineries in the United States, but there are 247 million registered motor vehicles as well as millions of users of other petroleum distillates. As a result, imposing the tax at the refinery level on petroleum products will be far less expensive than, say, trying to monitor emissions at the tailpipe. Similar principles apply to other fossil fuels. The key is to find a place between extraction and consumption where it is easiest to tax all or almost all of a fuel.

Arguments for downstream imposition of the tax tend to be based on a claim that a downstream tax is more visible than an upstream tax and, therefore, a downstream tax will have a greater effect. The claim would be that consumer response depends on visibility. It is doubtful that this effect could be very large in the case of a carbon tax for two reasons. First, firms are likely to advertise the embedded tax in, say, gasoline, so drivers would be aware that part of the cost of the gasoline is the tax. Second, key energy consumers – electric utilities and industrial energy users – are unlikely to be

affected by this behavioral phenomenon if it in fact exists. (Note that the tax would be fully salient in the sense of the term used by Chetty, Looney and Kroft and Finkelstein. So this claim requires a stronger form of salience than has been identified in the literature.)

Metcalf and Weisbach provide a detailed assessment of the choices for applying a carbon tax. In brief, they recommend applying the tax on oil at the refinery and on imports of refined products. The tax on natural gas can be imposed either at the well head or at processing plants along with points of import to the United States. Coal can be taxed at the mine or at electric generating plants and large industrial users. This reflects the fact that over 90 percent of coal is used for electricity production with the rest used by industry.

Greenhouse gases other than the emission of carbon dioxide from the combustion of fossil fuels are more difficult to tax. For example, methane emissions can arise from agricultural activities which are dispersed and difficult to measure, such as enteric fermentation. Similarly, nitrous oxide emissions can arise from the application of fertilizer and depend on the particular application techniques. Metcalf and Weisbach estimate that roughly half of the non-energy related greenhouse gas emissions could be included in the tax base at reasonable cost. Forestry and land use activities present a special challenge – a challenge common to any carbon pricing system. Forestry and land use serves as a net sink, removing some 1,000 MMT CO_2 from the atmosphere in 2009. Changes in land and forest use can add or remove carbon on balance. Adding these activities to the tax base would require establishing a baseline. To see the complexity of this, consider a forest that currently sequesters 100 tons of CO_2 per year. Should an owner of that property receive a tax credit for the 100 tons of sequestered CO_2? Or perhaps the owner should be subjected to a tax on fifty tons of CO_2 because an "undisturbed" forest would sequester 150 tons of CO_2? One way to proceed would be to set a baseline the emissions/sequestration based on historic emissions.

Once a baseline is set, a forestry carbon assessment could be undertaken periodically (e.g., every ten years) and the tax applied retrospectively. Continuing with the example above, assume the forest in question is an immature forest and over a ten-year period sequestration falls to eighty tons per year. With 100 tons per year established as the baseline, the annual emissions would be estimated to rise from zero tons in $year_0$ to twenty tons in $year_{10}$. The retrospective tax would be equal to two tons in $year_1$ times the $year_1$ tax rate plus four tons in $year_2$ times the $year_2$ tax rate and so on to $year_{10}$ when the tax is twenty tons times the $year_{10}$ tax rate. Landowners could be required to make estimated payments over the decade in anticipation of the retrospective liability. Reilly and Asadoorian and Metcalf and Reilly develop these issues in more detail.

One can imagine any number of complications with such a system. It may be preferable to leave forestry and land use out of the tax system but provide the opportunity for owners of such resources to opt in through offsets. This might be limited to major landowners to limit administrative costs. We might, for example, limit offsets to the major paper and forest product companies and require that they consider offsets on their entire stock of land rather than individual parcels. This reduces problems of non-additional projects (projects that would be undertaken regardless of whether there is a carbon tax).

Trade Issues

Because carbon emissions are a global externality – emissions anywhere affect everyone – and because of the large volume of trade in fossil fuels and in goods produced with fossil fuels, carbon taxes must always be designed with international considerations in mind. In an ideal world, all countries would impose a harmonized carbon tax so that emissions anywhere in the world faced the same price. Realistically, some major emitting countries either will refuse to impose any price on carbon at all or do so in a narrow or perfunctory way. Even countries that impose carbon pricing regimes may not harmonize their regimes creating problems when goods subject to different tax rates are traded.

If one set of countries imposes a carbon price and others do not, energy-intensive industries may shift their production to regions without a carbon price. The result is carbon leakage, an increase in emissions outside the taxing regions that offsets the emissions reductions in the taxing regions. Estimates of carbon leakage vary, but central estimates for a carbon tax in developed countries only are around 15% to 25%, measured as the increase in emissions abroad as a percent of reductions in the taxing region.

Border tax adjustments would impose a tax on the emissions from the production of imported goods and would rebate domestic carbon taxes when goods are exported. The key problem with border tax adjustments for carbon is determining the carbon content of goods that are exported or imported. Unlike border tax adjustments under a VAT, which are based on the price of the good, the carbon content of a good is not readily observable.

So long as the two trading countries both have a carbon price, however, border tax adjustments are not necessary. If both trading partners have carbon prices, neither would gain an advantage in trade with the other. Therefore, we can substantially reduce administrative costs by using an origin basis system (i.e., no border tax adjustments) for trade between countries with an adequate carbon price. Imports from countries without an adequate carbon price would, however, most likely need to be subject to a tax at the border as a substitute for their lack of a carbon price. Exports to these countries could either be allowed a rebate for carbon taxes here or not; there may be modest efficiency advantages to allowing a rebate but the administrative costs might be substantial.

There are possible methods for reducing administrative problems with determining the carbon content of a good when it is imported. One suggestion is that the border tax be imposed based on the carbon that that would have been emitted had the product been produced domestically. While one could do this with all imports, it probably makes sense to limit border adjustments to a handful of carbon intensive traded goods (e.g. steel, automobiles). This approach reduces the information problem

both by using domestic information and by limiting the class of goods it applies to. The major problem with this tax is that it will often be inaccurate because foreign production of a good often results in very different emissions than domestic production. Secondly, a tax based on domestic emissions would not create any incentive for foreign producers to substitute toward low-emission production techniques. The tax would remain the same, so if a low emission production technique is otherwise less desirable, the tax will not induce the needed switching. One could allow individual exporting firms to provide information proving that they are below their national averages. A particularly efficient firm, therefore, could get a lower border tax, creating an incentive to shift to more efficient technologies.

An alternative system would be to base border tax adjustments on estimates of average emissions in the exporting nation from production of a given good. This would require information about production techniques and energy systems abroad at the national level but not the firm level. While possibly more information intensive than basing the tax on the importing country's emissions, it is potentially more accurate. Thus, the border taxes for steel would reflect the national differences illustrated in the table above. The main question will be the availability and reliability of national-level data for developing countries. In addition, this approach runs directly into the legal problem with basing taxes on production techniques.

Any border tax adjustment, whether based on importing country information, exporting country information, or firm-level information, will require significant information gathering, documentation, categorization, and recordkeeping. We note that this border adjustment issue arises with any carbon pricing scheme, not just carbon taxes.

Finally we note that the legal status of border tax adjustments under a carbon tax is uncertain. The problem with their legality relates to the detailed rules under the GATT and WTO governing border tax adjustments in general and the scope of the so-called environmental exception. A detailed discussion of the legal issues related to border tax adjustments for carbon taxes is well beyond the

scope of this entry. World Trade Organization and United Nations Environment Programme (2009) discusses this in some detail.

4. Incidence of a Carbon Tax

Carbon pricing has very similar impacts to broad based energy taxes – which is not surprising since over eighty percent of greenhouse gas emissions are associated with the combustion of fossil fuels. The literature on distributional implications across income groups of energy taxes is a long and extensive one and some general conclusions have been reached that help inform the distributional analysis of carbon pricing. First, analyses that rank households by their annual income find that excise taxes in general tend to be regressive (e.g. Pechman looking at excise taxes in general and Metcalf looking specifically at a cluster of environmental taxes). Studies that use some measure of lifetime income (such as those by Davies, St. Hilaire and Whalley, Bull, Hassett and Metcalf, Lyon and Schwab, and Poterba), find lower degrees of regressivity in these taxes

Two important issues affect the measured progressivity of a carbon tax. First, it important to distinguish between sources-side and uses-side effects. Carbon taxes disproportionately burden those households who disproportionately consume carbon intensive goods and services. This is the uses-side effect. Many analyses focus only on uses side impacts under the assumption that carbon pricing will not affect factor prices and will only affect consumer prices. These studies, such as the study by Hassett, Mathur and Metcalf, tend to find that carbon taxes are regressive whether an annual or lifetime analysis is used.

Carbon taxes, however, are likely to affect factor prices as well. Rausch, Metcalf, Reilly and Paltsev, for example, find that returns to capital fall more than wages in response to a carbon tax. Since capital is disproportionately held by high income households, this makes carbon pricing progressive on the sources side. Rausch and co-authors find that the sources side impacts dominate the uses side impacts so that carbon taxes – ignoring the use of the revenues – is progressive.

This relates to the second point. How the revenues from a carbon tax are used affects the overall distribution. As noted by Metcalf a carbon tax might be regressive while a carbon tax reform could be progressive depending on the use of the revenue. That the use of carbon revenues matters for distribution is the basis for the distributional and revenue neutral proposal by Metcalf for a carbon tax swap.

5. Instrument Choice

A lively debate has transpired in the economics literature on the relative merits of a carbon tax versus a cap and trade system (cite to article in encyclopedia needed). In a world without uncertainty over marginal abatement costs for carbon emission reductions, the two instruments are economically equivalent. With uncertainty, the instruments may differ and have been analyzed using the framework of first set forth by Martin Weitzman. The Weitzman analysis finds price based instruments superior to quantity based instruments if the marginal damages curve is flatter than the marginal abatement cost curve in circumstances where uncertainty exists over the marginal abatement curves. Such is the case for greenhouse gas emissions where the pollutant is a stock pollutant with long-lived emissions.

Offsetting the economic advantage of the tax approach is the apparent political advantage of cap and trade system where allowance allocations can be used to build political support for the policy, as noted by Stavins. The insight here is that since allowance allocation has no efficiency cost (these are lump-sum distributions), the use of permits to build political support is a valuable tool to build coalitions for the policy. It should be noted that lump sum allocations through a carbon tax through tax thresholds and/or tradable tax credits are also possible.

Kaplow and Weisbach have challenged the Weitzman-type analysis on efficiency grounds. In brief, their argument is that policy can be and is revisited over time and with policy updating the differences between the two instruments go away. In addition, the Weitzman analysis limits attention to

linear instruments. The authors conclude that specific design considerations under either approach are fundamentally more important than choosing between tax or allowance based systems.

References

Bovenberg, A. Lans, 1999, Green tax reforms and the double dividend: An updated reader's guide, *International Tax and Public Finance* 6, 421-443.

Bruvoll, Annegrete, and Bodil Merethe Larsen, 2004, Greenhouse gas emissions in norway: Do carbon taxes work?, *Energy Policy* 32, 493-505.

Bull, Nicholas, Kevin A. Hassett, and Gilbert E. Metcalf, 1994, Who pays broad-based energy taxes? Computing lifetime and regional incidence, *Energy Journal* 15, 145-64.

Chetty, Raj, Adam Looney, and Kory Kroft, 2009, Salience and taxation: Theory and evidence, *American Economic Review* 99, 1145-1177.

Congressional Budget Office, 2009, S. 1733 clean energy jobs and american power act cost estimate (Congressional Budget Office, Washington, DC).

Daley, Gemma, 2011, Australia to use more than 50% of carbon price revenue to help households, Bloomberg (New York).

Davies, James B., Frances St. Hilaire, and John Whalley, 1984, Some calculations of lifetime tax incidence, *American Economic Review* 74, 633-49.

Ekins, Paul, and Terry Barker, 2001, Carbon taxes and carbon emissions trading, *Journal of Economic Surveys* 15, 325-376.

Elliott, Joshua, Ian Foster, Samuel Kortum, Todd Munson, Fernando Perez Cervantes, and David A. Weisbach, 2010, Trade and carbon taxes, *American Economic Review: Papers and Proceedings* 100, 465-469.

Finkelstein, Amy, 2009, E-ztax: Tax salience and tax rates, *Quarterly Journal of Economics* 124, 969-1010.

Hassett, Kevin A., Aparna Mathur, and Gilbert E. Metcalf, 2009, The incidence of a U.S. Carbon tax: A lifetime and regional analysis, *The Energy Journal* 30, 157-179.

Interagency Working Group on Social Cost of Carbon, 2009, Social cost of carbon for regulatory impact analysis under executive order 12866.

Intergovernmental Panel on Climate Change, Summary for Policymakers, in Climtae Change 2007 – Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the IPCC (2007)

Kaplow, Louis, 2004, On the (ir)relevance of distribution and labor supply distortion to government policy, *Journal of Economic Perspectives* 18, 159-175.

Kaplow, Louis, 2011, Taxes, permits, and climate change, in Gilbert E. Metcalf, ed.: *U.S. Energy tax policy* (Cambridge University Press, New York), pp. 168 - 192.

Keohane, Nathaniel, 2009, Cap and trade, rehabilitated: Using tradable permits to control U.S. Greenhouse gases *Review of Environmental Economics and Policy* 3, 42-62.

Lyon, Andrew B., and Robert M. Schwab, 1995, Consumption taxes in a life-cycle framework: Are sin taxes regressive?, *Review of Economics and Statistics* 77, 389-406.

Metcalf, Gilbert E., 1999, A distributional analysis of green tax reforms, *National Tax Journal* 52, 655-681.

Metcalf, Gilbert E., 2007, A proposal for a U.S. Carbon tax swap: An equitable tax reform to address global climate change, (The Hamilton Project, Brookings Institution, Washington, DC).

Metcalf, Gilbert E., 2009, Designing a carbon tax to reduce U.S. Greenhouse gas emissions, *Review of Environmental Economics and Policy* 3, 63-83.

Metcalf, Gilbert E., Sergey Paltsev, John M. Reilly, Henry D. Jacoby, Angelo Gurgel, Andrei Sokolov, and Jennifer Holak, 2008, Analysis of a carbon tax to reduce U.S. Greenhouse gas emissions, (MIT Joint Program on the Science and Policy of Global Change, Cambridge, MA).

Metcalf, Gilbert E., and John M. Reilly, 2008, Policy options for controlling greenhouse gas emissions: Implications for agriculture, *Choices* 23, 34-37.

Metcalf, Gilbert E., and David Weisbach, 2009, The design of a carbon tax, *Harvard Environmental Law Review* 33, 499-556.

Murray, Brian C., Richard G. Newell, and William A. Pizer, 2009, Balancing cost and emissions certainty: An allowance reserve for cap-and-trade, *Review of Environmental Economics and Policy* 3, 84-103.

National Treasury of the Republic of South Africa, 2010, Press release: Carbon tax discussion paper.

Pechman, Joseph A., 1985. *Who paid the taxes: 1966-85?* (Brookings, Washington DC).

Pigou, Arthur C., 1932. *The economics of welfare* (MacMillan and Co., London).

Poterba, James, 1989, Lifetime incidence and the distributional burden of excise taxes, *American Economic Review* 79, 325-330.

Poterba, James, 1991, Is the gasoline tax regressive?, *Tax Policy and the Economy* 5, 145-164.

Rausch, Sebastian, Gilbert E. Metcalf, John M. Reilly, and Sergey Paltsev, 2010, Distributional implications of alternative U.S. Greenhouse gas control measures, *The B.E. Journal of Economic Analysis & Policy* 10, 1 - 44.

Reilly, John M., and Malcolm O. Asadoorian, 2007, Mitigation of greenhouse gas emissions from land use: Creating incentives within greenhouse gas emissions trading systems, *Climatic Change* 80, 173-197.

Stavins, Robert N., 2008, Addressing climate change with a comprehensive us cap-and-trade system, *Oxford Review of Economic Policy* 24, 298-321.

Stern, Nicholas, 2007. *The economics of climate change: The stern review* (Cambridge University Press, Cambridge).

Sumner, Jenny, Lori Bird, and Hillary Smith, 2009, Carbon taxes: A review of experience and policy design considerations, (National Renewable Energy Laboratory, Golden CO).

U. S. Environmental Protection Agency, 2011, 2011 U.S. Greenhouse gas inventory report, (U.S. Environmental Protection Agency, Washington, DC).

Weisbach, David, 2011, Instrument choice is instrument design, in Gilbert E. Metcalf, ed.: *U.S. Energy Tax Policy* (Cambridge University Press, New York), pp. 113-158.

Weitzman, Martin, 1974, Prices vs. Quantities, *Review of Economic Studies* 41, 477-491.

World Trade Organization, and United Nations Environment Programme, 2009, Trade and climate change, in WTO-UNEP, ed.: (WTO Publications, Geneva).

Websites with country information:

Finland Ministry of the Environment: http://www.environment.fi/default.asp?contentid=147208&lan=en accessed on April 14, 2011.

Netherland, Ministry of Finance: http://english.minfin.nl/Subjects/Taxation/Environmental_taxes, accessed on April 14, 2011.

UK Revenue and Customs: http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?_nfpb=true&_pageLabel=pageExcise_InfoGuides&propertyType=document&id=HMCE_CL_001174#P38_2257, accessed on April 13, 2011.

British Columbia Ministry of Finance: http://www.fin.gov.bc.ca/tbs/tp/climate/A4.htm accessed on April 14, 2011.

South Africa: EIA Country Brief, http://www.eia.doe.gov/countries/cab.cfm?fips=SF, accessed on April 14, 2011.

EU: COM(2011) 168 and 169 may be found at found at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0169:FIN:EN:PDF

From: John M Reilly
To: Metcalf, GilbertDisabled
Subject: Fwd: question
Date: Thursday, August 09, 2012 1:32:16 PM
Attachments: 01-13-25percentoffset.pdf

Gib,

i think we discussed idea that we would try to look at the issue of using a carbon tax as part of solving budget problems. Do you have any thoughts on what would be useful for re: revenue neutrality. We can impose absolute revenue neutrality but we tend to require more than the 25% standard that the budget counters at CBO/JCT would require. And then in talking with Waxman's staff they indicated that in some cases there is no haircut for revenue neutrality. Correspondence with CBO below and report Terry mentions confirms that in some cases--e.g. if allowances given away for free they would apply no haircut believing this would not affect tax revenue. I have a hard time following the logic they use....but if CBO or JCT would actually apply no haircut, if the revenue is being returned via tax cuts, does it make more sense to simulate that case? Or assuming the 25% rather than our endogenous calculation?

(Not sure how this will come out in the end, but we had a couple of sets of runs that needed adjustment. In the first set, emissions baseline was too high, but the economic results were that the tax reduced emissions but caused a net loss in welfare--no strong double dividend by using revenue to cut other taxes--but then a relatively large amount of revenue was going to revenue neutrality. Then in a rush before Sebastian left he redid the baseline to get lower emissions-but did so by adjusting labor productivity down--in this set of cases we had strong double dividend effects where substituting the carbon tax for other taxes led to an improvement in welfare. However, the labor productivity adjustment was so large that GDP growth was only .5% per year. Before I noticed that, I shared some results with the Congressional folks but then warned them when I realized what was going on that these might not stick--of course they love the economic benefit of carbon tax. Here I think because economic growth was so slow, tax receipts were growing slowly, and so any impact on taxes was reduced--so a much lower percentage of carbon tax revenue was needed for revenue neutrality. Sebastian is now redoing the runs, trying to get a better baseline--if my diagnosis above is correct then I'm thinking likely back to no strong double dividend, but if we are being excessive with the absolute revenue neutrality, I'd be willing to relax that--relative neutrality?)

Not sure you have time for this but i it is of interest and you have some thoughts I would appreciate it.

John

Begin forwarded message:

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Subject: RE: question
Date: August 9, 2012 12:25:18 PM EDT
To: John M Reilly (b)(6) @mit.edu<(b)(6) @mit.edu>>

Hi John,

It is actually JCT, not CBO, that would score a carbon tax. I can't speak for them (or even for CBO!) but I think the logic that they would apply would be consistent with the logic that CBO would applies when determining whether or not an offset (i.e., the haircut) is, or is not, applicable to a cap-and-trade program. (The purpose of the offset is to reflect the net effect of policy on the budget under the assumption that output remains constant, a standard assumption in scoring bills. For example, holding output constant, a carbon tax or cap-and-trade program would reduce taxable incomes in a manner that would lower revenues collected by other taxes. The main question, then, is whether the carbon tax revenues are used in a manner that would offset that reduction that would otherwise occur, that is whether or not the use of the revenue would "offset the offset"...you can imagine how fun this is to explain to folks!)

The attached document lays out the logic and will hopefully answer your questions. But, as I said, JCT would be the ultimate arbiter.

Hope this is helpful.

Terry

_____
From: John M Reilly (b)(6) @MIT.EDU<(b)(6) @MIT.EDU>]
Sent: Wednesday, August 08, 2012 4:22 PM
To: Terry Dinan
Cc: Rausch Sebastian
Subject: Re: question

Terry,

Now here's a question for you. We are talking to House Energy/Commerce, Waxman folk on their possible interest in a carbon tax as a solution to deficit reduction. I understand they are trying to get CBO to do an analysis of this as well. A question has come up as to how CBO would score the budget impacts, particularly (in your/their lingo) the haircut you would take for revenue neutrality. They discussed a fairly complex set of rulings in the past where depending on what the tax revenue was used for led to different requirements on whether or not their would be a "haircut". They suggested that if they were using carbon tax revenue to reduce other tax rates (personal income, corporate, payroll) from past experience they thought CBO would not apply a haircut, whereas if they were using the money to maintain transfer payments then you probably would require a haircut.

Any thoughts you might share on this? I realize you are likely not in position to commit to exactly what CBO might do, but if there is something we could refer to where CBO has scored differently depending on the use of the revenue, we could at least refer to that as a motivation for using a different haircut rate.

John

On Aug 6, 2012, at 11:36 AM, Terry Dinan wrote:

Thanks Sebastian (and John). I'll take a look at each of these. Terry

From: Rausch Sebastian (b)(6) @ethz.ch]
Sent: Monday, August 06, 2012 11:11 AM
To: Terry Dinan
Cc: John M Reilly
Subject: Re: Fwd: question

Hi Terry,

You want to look at the following two studies:

Report 185.
Distributional Implications of Alternative U.S. Greenhouse Gas Control Measures
Rausch, S., G.E. Metcalf, J.M. Reilly and S. Paltsev, Joint Program Report Series (June 2010)
http://globalchange.mit.edu/research/publications/2065

and

Report 202

Distributional Impacts of Carbon Pricing: A General Equilibrium Approach with Micro-Data for Households<http://globalchange.mit.edu/research/publications/2168>
Rausch, S., G. Metcalf, J. M. Reilly, Joint Program Report Series<http://globalchange.mit.edu/pubs/all-reports.php> (July 2011)
http://globalchange.mit.edu/research/publications/2168

Report 185 looks at GHG control policies closely related to the Waxman-Markey proposal. Report 202 investigates the impacts of a $20 carbon tax. Both studies decompose the impacts of carbon pricing into the uses side of income (i.e., how consumers spend their income) and the sources side of income (i.e., how consumer derive their income) effects.

Our general finding is that sources side of income effects from carbon pricing are progressive because higher-income households derive a larger fraction of their income from capital and labor income as compared to lower-income households (and relative returns to capital fall). In addition, if government transfers (social security, unemployment benefits etc.) are indexed to inflation---which is the case for roughly 95% of government transfer payments to households in the US---lower-income households are insulated from adverse shocks on factor income as they derive a relatively large share of their income from transfers. Therefore, neglecting uses side of income effects, as many traditional analyses have done, overestimates the regressivity of a carbon pricing policy.

Let me know if you have any questions.

Sebastian

Am 03.08.2012 03:57, schrieb John M Reilly:
Can you send on reference to best paper on this. Terry is a great person in us gov.

Sent from my iPhone

Begin forwarded message:

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Date: August 2, 2012 1:39:41 PM MDT
To: (b)(6) @mit.edu<(b)(6) @mit.edu>" (b)(6) @mit.edu<(b)(6) @mit.edu>>
Subject: question

Hi John,

I'm trying to pull together studies that provide information about how a U.S. carbon tax might affect relative returns to capital and labor. I was wondering if you could please tell me which MIT studies I should look at to get your best/most recent insights with respect to this question.

Thanks very much! Hope you are well.

Terry

Terry M. Dinan
Senior Advisor
Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>
(202)226-2927

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Prof. Dr. Sebastian Rausch

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ECONOMIC AND BUDGET ISSUE BRIEF
CBO
A series of issue summaries from the Congressional Budget Office
JANUARY 13, 2009

The Role of the 25 Percent Revenue Offset in Estimating the Budgetary Effects of Legislation

When excise taxes, customs duties, and other types of "indirect" taxes are imposed on goods and services, they tend to reduce income for workers or business owners in the taxed industry and for others throughout the economy. Consequently, revenue derived from existing "direct" tax sources—such as individual and corporate income taxes and payroll taxes—will also be reduced. To approximate that effect, the Congressional Budget Office (CBO), the Joint Committee on Taxation (JCT), and the Treasury Department's Office of Tax Analysis (OTA) apply a 25 percent offset when estimating the net revenue that legislation imposing some form of indirect tax is expected to generate. In other words, the estimated proceeds from the indirect tax are reduced by 25 percent to account for the resulting reductions in income and payroll taxes. The offset is made in addition to accounting for behavioral responses to the new tax.

Although applying the 25 percent offset for budget estimates is a longstanding convention, proposals to address global climate change have created greater public awareness of that practice. Because tradable emission permits would have economic effects that are identical to those of a tax on emissions, which would be an indirect tax, CBO applies the offset when calculating the revenue that such policies might generate. For example, if the issuance of emission permits was estimated to generate $100 billion in revenues in a given year, the estimate would also reflect an offsetting reduction of $25 billion in income and payroll taxes, for a net revenue gain of $75 billion. This brief explains that estimating convention—its rationale, application, and implications for policy decisions.

Why an Offset Is Needed

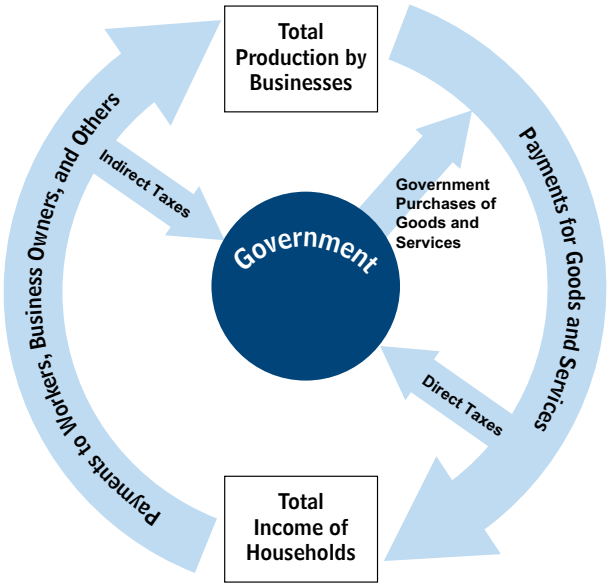
More than 90 percent of federal revenue comes from income and payroll taxes—what economists generally refer to as direct taxes. Much of the remainder is generated by excise taxes, tariffs, and a variety of governmental fees and assessments that are all thought of as indirect forms of taxation.[1]

The distinction stems from the way in which total income and total production are measured in the economy. In the absence of taxes, all that is spent on goods and services in the economy becomes income for those who produce, or supply the means to produce, those goods and services. Proceeds from that spending are used to provide compensation—in the form of wages, profits, rent, and interest—to those who supply the labor, machines, buildings, and other inputs that are needed to produce those goods and services. Taxes imposed on that compensation are considered direct. Taxes imposed at an intermediate stage of production and sale are indirect. Because the prices of goods and services must reflect all the costs of production, imposing an indirect tax would divert some of the proceeds from spending on those goods and services that otherwise would be available for compensation to those firms or individuals that provide the productive inputs.

1. That classification is in contrast to the way that direct and indirect taxes are distinguished under law. Under the legal definition, indirect taxes are imposed on an action or event, such as importing, manufacturing, buying a good, paying for a service, or transferring an asset. Direct taxes are imposed on objects, such as property or wealth. Under that classification scheme, income and payroll taxes are also considered indirect taxes.

Figure 1.

Federal Revenues and the Circular Flow of Income in the Economy



Source: Congressional Budget Office.

Thus, indirect taxes place a wedge between spending and compensation. Even ignoring the effects that taxes might have on total production in the economy, what the government extracts in the form of indirect taxes leaves less to be paid to those who provide the inputs to the production process. Out of what is then paid in compensation, the government extracts more by imposing income and payroll taxes—the direct taxes. Thus, every dollar taken by the government as an indirect tax has the potential to reduce the tax base remaining for direct taxes. That is why estimates of the revenue arising from indirect taxes need to include an offset of some type.

The easiest way to explain the principle behind the offset is to describe what would happen if indirect taxes were imposed that raised a firm's cost of production and the firm did not pass that additional cost forward to consumers in the form of higher prices for its goods. The effect of the tax then would be to reduce the firm's income, which, in turn, would reduce the revenue collected through direct taxes on that income.

Although firms might absorb an indirect tax immediately after its imposition, in most instances such additional costs would eventually be passed on to individuals. Even with such a pass-through of costs, a loss of revenue from direct taxes would still occur. The nature of that pass-through might vary, depending on how the tax affected overall price levels. One possible outcome is that the overall price level of goods and services in the economy would not be affected by firms' attempts to pass the additional costs forward to consumers in the form of higher prices.[2] If, for instance, the Federal Reserve geared its monetary policy to adhere to a chosen inflation target, individual prices would change relative to one another, with the prices of more highly taxed goods rising relative to those of less-taxed goods. But the prices of goods least affected by the new tax would rise more slowly than they would have otherwise, so that the overall level of prices, on average, would be the same as without the tax.

With the overall level of prices unaffected by its imposition, the tax, instead of being borne by consumers, would be borne, in the form of reduced compensation, by all those who provide the inputs to produce goods. Wages, rents, and other payments for inputs would be smaller than they would have been without the tax. As a result, collections of direct taxes would be similarly lower. Essentially, whether a tax is absorbed in its entirety by firms' profits (as would probably be the case in the short run) or passed along in higher relative prices (as it probably would be in the longer run), the effect of an indirect tax on the amount of revenue collected from direct taxes would be about the same.

Put another way, income and production in the economy can be thought of as a circular flow: Total spending on the goods and services produced becomes total income for those producing them (see Figure 1). If an indirect tax is imposed, some of the value of the output is no longer available to workers and business owners as income. By imposing such a tax, the federal government removes some of the output from the circular flow for its use, so that what remains to become payrolls and profits—and the portion of those amounts that is destined to become receipts from income and payroll taxes—is lower as a result.

The effect of indirect taxes on direct tax receipts is illustrated in the two simple scenarios shown in Table 1. Before any indirect tax is adopted (as in Case 1), the value

2. That situation also corresponds to the standard estimating convention of holding macroeconomic aggregates—for instance, gross domestic product, employment, and the overall level of prices in the economy—unchanged.

Table 1.

Revenue Flows With and Without an Indirect Tax

(Dollars)

	Value of Production	Revenue from an Indirect Tax (10 Percent)	Income from Capital and Labor	Revenue from a Direct Tax on Income (25 Percent)	Toal Revenue from Direct and Indirect Taxes
Case 1: Without an Indirect Tax	1,000	0	1,000	250	250
Case 2: With an Indirect Tax	1,000	100	900	225	325

Source: Congressional Budget Office.

of production, or total output, is $1,000. Because there are no indirect taxes, income (in the form of wages, interest, rent, and profits) is also $1,000. An existing direct tax of 25 percent on income yields revenue of $250 for the government. If an indirect tax is then levied that amounts to 10 percent of output (as in Case 2), the government realizes $100 in revenue from the new tax and the income of individuals supplying the capital and labor falls to $900. Consequently, the income tax now yields only $225, so that total revenue realized by the government is $325. Although the indirect tax raised $100, the net effect on governmental revenue is an increase of only $75.

The fiscal outcome would be much the same if the assumption about the overall price level of goods and services in the economy was dropped. If, instead of strictly adhering to a chosen inflation target, the Federal Reserve accommodated an overall increase in prices—thereby permitting the indirect tax to be "passed forward" to consumers, rather than backward to producers in the form of reduced income—the revenue collected through direct taxes would dip, but by far less than in Case 2, in which the price level is unaffected by the imposition of an indirect tax. Because so much of the income tax is indexed for inflation, the higher overall price level combined with the graduated nature of the individual income tax would cause it to garner proportionately less in receipts as real (inflation-adjusted) income fell. Direct tax collections would drop off somewhat as a result. However, in that situation, most of the effect of the higher prices caused by an indirect tax would be manifested as increased government spending—for example, spending would be higher for transfer programs, such as Social Security, that are indexed for inflation, and for the goods and services whose prices had increased. In this example, in which the impact of the indirect tax is passed forward to consumers, its offset effect would register primarily on the spending side of the budget. Nevertheless, the net effect on the budget deficit or surplus would be about the same, again making the net change in the deficit smaller than the amount of the additional collections from the indirect tax itself.

Although the explanation is easiest to understand if it reflects the assumption that total output is the same whether or not a new indirect tax is imposed, the need to incorporate the offset reflects real-world budgetary effects and does not stem from that assumption. Estimates of the budgetary effect of proposed legislation routinely assume that macroeconomic activity—in the form of total output, employment, and prices—is unchanged. Relaxing that assumption would affect revenue estimates because higher tax rates can generally be expected to lower overall output as a result of their typically negative effects on economic efficiency (lower rates would generally be expected to have the opposite effect). But taking such macroeconomic changes into account would generate an *additional* effect on direct taxes. It would not eliminate or even reduce the offset effect. Indeed, those macroeconomic "dynamic" effects would go in the same direction as the offset.

How the Offset Is Applied

Ideally, the revenue generated by indirect taxes that is simultaneously lost by the government in the form of direct tax revenue could be calculated on the basis of the individual characteristics of the tax in question. Different taxes affect taxpayers in various income classes (and, therefore, in different income tax brackets) differently. Moreover, the effect of a proposed tax could vary depending on how long it would take for the burden of the

tax to shift from firms' profits to all forms of compensation, or whether the tax could be expected to be passed forward (in the form of higher prices) instead of backward (into reduced compensation). Handled in that way, each proposal to impose new indirect taxes or increase existing ones would be subject to an offset of a different percentage.

Over the years, CBO, JCT, and OTA adopted the convention of using a single offset of 25 percent when estimating the budgetary effects of proposed legislation involving indirect taxes. That practice is an approximation. How closely it adheres to reality depends on a number of features of the tax system, which are always in flux. On the basis of CBO's observation of how corporate tax liability responds to changes in taxable income, a one-dollar increase in the cost of production would reduce corporate tax receipts by about 25 cents. Consequently, if a newly implemented indirect tax was absorbed by producers, direct tax collections would be expected to decline by about 25 percent of the gross amount raised by that tax. Combined payroll and income tax rates for years after 2010 are such that receipts from those taxes together would be expected to fall by about 25 percent of any reduction in income (that decline would be smaller under current tax rates).[3] So, if an indirect tax is "passed backward" in the form of reductions in compensation throughout the economy, the decrease in direct tax receipts would again be about 25 percent of the gross proceeds of the indirect tax.[4]

Estimates of revenues arising from proposals to create or change an indirect tax thus are subject to an offset of 25 percent, which takes the form of counting only 75 percent of the gross change in revenues otherwise expected to be collected by the federal government from the levy. The effect is symmetric: Just as an increase in estimated revenues from indirect taxes would be reduced by 25 percent, a proposed decrease in indirect taxes would result in estimated revenue losses amounting to only 75 percent of what the cut otherwise would be expected to cost.

That adjustment is made in addition to accounting for the behavioral effects that are typically incorporated in every revenue estimate. For example, an analyst would first determine how much an increase in gasoline tax rates would reduce gasoline consumption, to what degree compliance might decline, and any other responses relevant to determining what receipts the tax itself would raise. After incorporating all those effects and computing the expected increase in tax receipts, the offset of 25 percent would be applied to account for the impact of the gasoline tax on direct taxes. (As part of the same convention, the impact of the proposed tax is generally presented in the cost estimate simply as a single net flow of receipts, netting out the 25 percent offset from the estimated proceeds of the indirect tax.)

The offset can complicate a program's design when an indirect tax is to be imposed to fund a specific government service because, in general, a proposal that calls for spending the *gross* proceeds from an indirect tax or fee would increase the budget deficit. In such cases, the fee or tax must be sufficient to yield gross receipts in excess of the expected outlays if budget neutrality is to be maintained. Policymakers have sometimes dealt with the effect of the offset by allocating only 75 percent of the receipts of the tax to the program being funded, with the rest left unspent to offset the projected loss of income and payroll taxes.

Limits of Application

In general, the 25 percent offset is applied only to proposals that call for changes in indirect taxes. The offset is not applied to proposals that involve changes in direct taxes. Nor is it applied when estimating the budgetary effects of proposed changes in outlays—even when those changes appear to affect incomes in ways similar to indirect taxes.

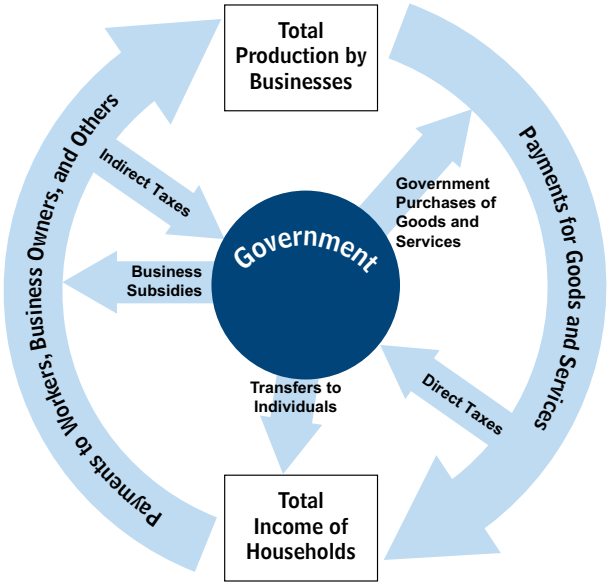
Estimates of proposals to change direct taxes do not generally require an offset. However, estimates of proposals related to employer-paid payroll taxes are a major exception. Such taxes are direct in the sense that they are based on an employee's compensation, but they do not appear in any measure of a worker's pay. Consequently, boosting the employer's share of Social Security taxes or its payment of unemployment insurance premiums would

3. Rates are scheduled to rise in 2011 with the expiration of tax changes enacted in the Economic Growth and Tax Relief Reconciliation Act of 2001 and the Jobs and Growth Tax Relief Reconciliation Act of 2003.

4. The 25 percent offset is also a bit high if the tax is passed forward in the form of higher prices. The federal share of the economy is closer to 20 percent; the remaining effect on taxes is not quite enough to bring the total offset to 25 percent. Thus, on average, one would expect the offset to be a bit less than in the passed-backward scenario.

Figure 2.

Federal Revenues and Transfer Payments in the Context of the Circular Flow of Income



Source: Congressional Budget Office.

ultimately reduce income that is counted for purposes of determining employees' income and payroll taxes. An offset would be required in that case, but estimators would not use 25 percent because the relevant offset would be based on a slightly different set of direct tax bases.[5]

The federal government also collects money that is recorded as an offset to—that is, a reduction in—spending, rather than as revenue. Such income is labeled "offsetting collections" or "offsetting receipts" and most often consists of businesslike or market-oriented transactions, representing collections from the public in exchange for goods or services. Although those collections resemble indirect business taxes and reduce the deficit in a similar way, estimates of the income from such payments are not subject to an offset because they do not reduce the income subject to direct taxes. If a firm chose to participate in such a transaction, the payment it made to the government either would substitute for some other production cost the firm otherwise would incur or be in exchange for some service that enabled the firm to produce something it was not producing before (such as oil from a new lease). Consequently, an increase in such collections would not reduce taxable income, and the net proceeds to the government would be the full amount collected; no offset would occur.[6]

As a general rule, the 25 percent offset is not applied to estimates of spending proposals. Making the standard assumption that the macroeconomic conditions that determine total output and employment would not be affected, additional spending by the government on goods and services would simply substitute for spending elsewhere in the economy. Therefore, such spending by the government on goods and services would generate no additional taxable income, nor would reduced spending diminish taxable income. Direct taxes would be unaffected.

In contrast to spending on goods and services, outlays for transfer payments to individuals and subsidies to business entities could be expected to affect collections from income and payroll taxes. In terms of the circular flow of income and production in the economy, those payments are the mirror image of indirect taxes (see Figure 2). For example, a subsidy provided to a business could be expected to have a net cost of about 75 percent of the outlay because roughly 25 percent of the subsidy might be expected to be recouped by direct taxes on the business. Conversely, cutting a subsidy would produce savings, on net, of about 75 percent of the expenditure.

Nonetheless, under longstanding procedures governing the Congressional budget process, offsets generally are not applied to legislative proposals that otherwise would affect only outlays. That process treats outlays and revenues differently: The Congressional budget resolution specifies spending allocations among the various committees but assigns a single revenue allocation to the House and Senate as a whole. Furthermore, House and Senate rules require that revenue matters be referred to the

5. Other changes in direct taxes can affect other tax collections, but, again, those effects must be calculated rather than approximated by applying the 25 percent offset.

6. The logic behind that contrasting treatment of indirect taxes and offsetting receipts applies only if the offsetting receipt or collection truly results from a businesslike transaction. Sometimes proposed legislation designates a payment as an offsetting receipt when it is really an indirect tax. When that happens, the failure to apply a 25 percent offset results in a misestimation of the proposal's true net budgetary effect.

Table 2.

Revenue Flows Under a Hypothetical Cap-and-Trade Program

(Dollars)

	Value of Production	Revenue from Auctioned Allowances	Value of Allowances Given Away	Businesses' Allowance Expenditures (Explicit or implicit)	Taxable Income of Capital and Labor	Revenue from a Direct Tax on Income (25 Percent)	Change in Direct Tax Revenue	Net Increase in Resources Available to the Government
Base Case:								
No Policy	1,000	0	0	0	1,000	250	0	n.a.
Scenario 1:								
Allowances Auctioned	1,000	100	0	100	900	225	-25	75
Scenario 2:								
Allowances Given to a Taxable Entity	1,000	0	100	100	1,000	250	0	0
Scenario 3:								
Allowances Given to a Nontaxable Entity	1,000	0	100	100	900	225	-25	-25

Source: Congressional Budget Office.

Note: n.a. = not applicable.

House Committee on Ways and Means and to the Senate Committee on Finance, respectively. Hence, the application of a revenue offset to proposals that otherwise would affect only outlays could cause jurisdictional or procedural difficulties.

In a limited number of situations, a revenue offset to spending can be recognized, at least implicitly. In particular, when an indirect tax is proposed to finance an expenditure that, in turn, would function as a subsidy, the revenue estimate can ignore the offset altogether. In such a case, there is what can be thought of as an "offsetting offset"—namely, a *reduction* in direct taxes resulting from the imposition of an indirect tax and a corresponding *increase* in direct taxes as a consequence of the subsidy. The two effects on direct taxes would net out to zero; the ultimate effect on the deficit would be the same as if there were no offsets at all. For example, imposing a tax on gasoline that was earmarked to pay a subsidy to ethanol producers would be such an exception. The tax would reduce taxable income, but the subsidy would increase taxable income by the same amount. Because the two effects would cancel each other out, no offset would be applied.

The Offset and Carbon Policy

Although they operate through different mechanisms, cap-and-trade programs and emission taxes have essentially the same economic effects. The former would limit the quantity of allowable emissions, which in turn would raise the prices of goods that are responsible for generating greenhouse gases, while emission taxes would add to the prices of such goods and reduce quantities emitted as the public bought fewer of the goods in response to the higher prices. Proceeds under either policy—emission taxes or the auction of emission allowances—would show up in the federal budget as revenues.

As a consequence, both an emission tax and auctions of emission allowances, for a given level of output, would reduce taxable income and payrolls and the direct taxes derived from them. The amount that firms would pay in such fees or taxes would be in addition to what they

would have to pay in compensation to those who provide the inputs needed to produce goods and services. At the same time, those fees or taxes would purchase nothing that firms were not already using before the policy change was implemented. The right to emit carbon dioxide—previously free—would become a cost of doing business. Ultimately, for a given level of output, income subject to direct taxes would fall, and the revenue collected through either the emission tax or the auction of emission allowances would be partially offset by revenue lost in payroll and income taxes. Because of that offset, the government, on net, would receive only about 75 percent of the revenue generated by issuing tradable emission allowances or imposing an emission tax.

Table 2 illustrates the effects that a hypothetical cap-and-trade program, implemented in one of three ways, would have on revenue. Just as in Table 1, the base case—in which no emission policy exists and, therefore, no indirect tax is assessed—is shown in the first row: Output and income are both $1,000 and income taxes generate $250. If a cap-and-trade system was created and allowances were auctioned, as shown in Scenario 1, $100 from those auctions would be raised for the government. Firms would have to spend $100 more to operate, leaving $900 to be taxed. The income tax would then yield only $225, so that all revenue totaled $325—a net increase of $75, not $100.

Instead of being auctioned, emission allowances could be allocated to some parties at no cost. CBO has concluded that the value of emission allowances should be counted as governmental revenues whether they are auctioned or given away.[7] Even if the permits were given away (as grandfathered allowances, for example), their creation would generate value for the government equivalent to that which would have been realized if the permits were auctioned. If realized as auction proceeds, the additional value would be available for either increased government spending or deficit reduction. If the permits were given away, their economic value would be simultaneously accrued and spent by the government as it transferred the permits to the grantees.

But the existence of the direct tax offset means that the free allocation of emission allowances under a cap-and-trade program could cause the federal deficit to increase. If allowances were given away to another entity, federal outlays would increase by the full value of the allowance. But revenues would increase by only 75 percent of the allowance value: the value that the allowance would bring at auction minus the reduction in direct tax receipts that would result from the added cost of production. Moreover, that net budgetary impact would occur even if the allowance giveaways were not recorded in the budget; it is enough that they have the effect of adding to business costs and reducing taxable income.

Many comprehensive proposals addressing global climate change involve either giving away allowances or spending the proceeds from emission taxes or tradable permits. Under some circumstances, such proposals can be deficit-neutral, but in other situations, because of the direct tax offset, they could cause the federal budget deficit to increase. Whether such proposals would increase the deficit would depend on who the recipients were and what they used the allowances or funds for. In some cases, the "offsetting offset" phenomenon could mean that no deficit effect would occur when allowances were given away: Federal outlays would increase by the full amount of the added spending or the value of the allowances given away; federal revenues would rise by the full amount of the proceeds or the value of the allowances issued because there would be no offsetting effect on the government's income from direct taxes. For example, if certain energy-producing firms received the allowances with no strings attached, the result would be comparable to a business subsidy that was combined with an indirect tax. The effects of the subsidy on payroll and income taxes would cancel out the effects on payroll and income taxes of imposing the emissions cap. So, for estimating the budgetary impact, the net offset would be zero. The same logic would apply if allowances were auctioned and the proceeds given away. If auction proceeds were granted to firms without conditions being imposed on how those proceeds were spent, or if the proceeds were transferred to

7. See Congressional Budget Office, cost estimates for S. 3036, the Lieberman-Warner Climate Security Act of 2008 (June 2, 2008), and S. 2191, the America's Climate Security Act of 2007 (April 10, 2008).

individuals in a way that showed up in their taxable income, no offset would be involved.[8]

However, if allowances were given to private foundations or to a public-private institute to be traded on the market to raise funds for programs (or if auction proceeds were given to such entities), the revenue offset would apply but there would be no comparable offset to spending. The allowances would still be regarded as raising, on net, only 75 percent of their gross market value. None of the funds would be expected to be recovered by the income tax.

The contrast between those two situations is shown in the remaining two rows of Table 2. When the government gives emission allowances to a (taxable) commercial entity (Scenario 2), the firm no longer must incur a cost to secure permission to generate emissions. Total income in the economy remains at $1,000, and total governmental revenue is $350—$100 more than was collected before the allowances were created. That amount is just enough to finance the $100 in allowances given away; giving them to that taxable entity at no charge leaves the government with the same net resources as before. But if the allowances are given to a nontaxable entity (Scenario 3), nothing makes up for the $100 increase in production costs and the resulting $100 decline in taxable income. Under that scenario, implied receipts rise by only $75, a sum that is less than the implied outlay of $100 for the free allowances. No explicit spending or revenue arises from the allowance program, but income tax receipts fall by $25. The government actually has $25 less available to finance other activities than it had before the program was implemented.

Spending by the government on its own activities has an effect similar to that of giving allowances to nontaxable entities. Because the total output of the economy in the long run is determined by its capacity to produce, that spending would be expected to change only the kinds of goods and services produced, not their total amount; such spending does not, therefore, generate more direct tax revenue. Thus, if allowances are auctioned or emissions are taxed, and a deficit-neutral outcome is desired, only 75 percent of the proceeds would be available to finance government spending on various programs—whether those programs are also aimed at combating global climate change or otherwise. The same is true if the auction-financed spending is conducted through an intermediary, such as a state government, a research institute, or a private contractor. Using auction proceeds or receipts from a tax on emissions to subsidize business undertakings to conduct research or to place into service energy-saving equipment would be analogous to the government's paying for a private contractor; again, only 75 percent of the proceeds would be available to obtain a deficit-neutral result.[9] Any additional spending would add to budget deficits.

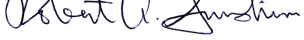
Conclusion

The 25 percent offset reflects a real economic phenomenon: Increases in indirect taxes can always be expected to produce partially offsetting effects on direct tax sources, even if the effects of taxes on the overall economy are ignored. While inexact, the offset makes the picture of the net budgetary effects of emission taxes and tradable allowances more accurate. Without that adjustment to estimates of a proposal's gross proceeds, expected revenues would be substantially overstated. As a result, proposals to spend the gross proceeds from emission taxes or tradable allowances could, depending on the nature of the spending, lead to a significant increase in budget deficits.

8. The offset would also not apply if the proceeds were transferred to businesses or other entities in a way that guaranteed they would be passed forward in the form of lower prices. The reduction in prices of subsidized goods would mean less of a decrease in compensation to the factors of production (caused by the indirect tax in the first place) and thereby would eliminate the effect on direct tax receipts.

9. Once firms were told how to spend the money, they would incur deductible expenses that would reduce their taxable income.

This brief was prepared by G. Thomas Woodward of the Congressional Budget Office's Tax Analysis Division. It and other CBO publications are available at the agency's Web site (www.cbo.gov).



Robert A. Sunshine
Acting Director

From:	Jaffe, Judson
To:	Metcalf, GilbertDisabled; (b)(6) @mit.edu"
Subject:	RE: Fwd: question
Date:	Sunday, August 12, 2012 10:04:19 PM
Attachments:	x-23-12[1].pdf 5-15-waxmanletter[1].pdf

John,

On the level of the offset, you might be interested in the updated JCT numbers, which CBO apparently adopted too (attached as "x-23...pdf" and at: https://www.jct.gov/publications.html?func=showdown&id=4406). As you'll see, the numbers increase over time from 24.4% in 2012 to 29.8% in 2022, reflecting the scheduled increase in statutory tax rates if there are no new laws.

I've also attached a letter that CBO sent to Waxman's staff in 2009 on the scoring of cap-and-trade in case it has helpful additional detail beyond the CBO report that you sent Gib.

Regarding the fact that your estimates of the offset exceed 25%, I think a big piece of what you're picking up is that your model presumably captures BOTH changes in taxable income holding constant economic activity (which is the focus of the CBO/JCT offset), AND also the overall change in economic activity associated with higher tax rates. As you may be familiar with, capturing the latter effect is referred to as "dynamic scoring" in budget scoring lingo. CBO and JCT explicitly do not use dynamic scoring--there has been a long-standing debate about this though. The CBO/JCT offset only captures the former effect. Reference to dynamic scoring can be found at page 3 of the CBO report that you sent Gib. Consistent with your finding, CBO states that "those macroeconomic 'dynamic' effects would go in the same direction as the offset." (i.e., they would have gotten a higher offset estimate too if they factored in these effects)

Regarding the instances where CBO doesn't apply the offset (or applies the "offsetting offset"), I think it's easiest to describe those circumstances as ones where allowance value is recycled in a way that makes that value taxable, rather than nontaxable, income. For example, imagine a cap-and-trade program's effect on taxable income from a coal-fired power plant. For this example, assume the plant is sufficiently efficient that its generation output is unchanged by the cap-and-trade policy.

- If allowances are auctioned, the coal plant's taxable income will decline by the value of allowances that it has to acquire at auction (i.e., by the amount that its expense go up). Corporate tax receipts from that plant will decline accordingly (i.e., there should be an offset).

- If the allowances are instead freely allocated to that coal plant (and others), that coal plant's taxable income will be unchanged relative to the no-policy baseline (in fact, its taxable income may rise due to higher electricity prices, but let's put that aside). As a result, in this allocation scenario, corporate tax receipts from that coal plant are unchanged relative to the no-policy baseline (i.e., there should be no offset, or an "offsetting offset" should be applied).

- Finally, if allowances are auctioned and auction receipts are used to lower corporate tax rates, the coal plant's taxable income would still decline by the value of the allowances it had to acquire at auction (i.e., there should be an offset). The fact that the auction receipts are then used to reduce corporate income tax rates does not undo the cap-and-trade program's effect on the coal plant's taxable income (i.e., there should still be an offset). Instead, this use of the auction receipts just leads to application of a lower tax rate on the remaining taxable income. As this last example shows, if receipts from the new policy you are modeling are recycled through lower tax rates there should still be a need for the offset, and I believe CBO/JCT would score this accordingly.

If the difference between your endogenous offset estimate and the CBO/JCT offset is not substantial, I would be inclined to just leave it and note that you're picking up dynamic effects in addition to the standard effects that CBO/JCT capture in their offset. Alternatively, perhaps you could see how different your estimates are relative to the CBO/JCT offset, and simply relax your constraint on government receipts to match that.

Jud

-----Original Message-----
From: Metcalf, Gilbert
Sent: Saturday, August 11, 2012 8:07 AM
To: Jaffe, Judson; (b)(6)@mit.edu'
Subject: Fw: Fwd: question

John,
There are two issues: how much other revenues decline and how to score for budget neutrality purposes. Your model can measure the first but you need to follow the scoring rules for determining the amount of revenue you can offset with carbon tax. So it seems to me that you would use the 25 percent haircut for the latter.

On haircut treatment, I understand CBO made very subtle distinctions in the cap and trade context depending on allowance treatment. But a carbon tax is an excise tax and I am not sure that those distinctions persist in the tax context. I am copying Jud Jaffe in my office in hopes he may have more info on this. Jud: you might want to check with Curtis as well.
Gib
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

----- Original Message -----
From: John M Reilly (b)(6) @MIT.EDU]
Sent: Thursday, August 09, 2012 01:31 PM
To: Metcalf, Gilbert
Subject: Fwd: question

Gib,

i think we discussed idea that we would try to look at the issue of using a carbon tax as part of solving budget problems. Do you have any thoughts on what would be useful for re: revenue neutrality. We can impose absolute revenue neutrality but we tend to require more than the 25% standard that the budget counters at CBO/JCT would require. And then in talking with Waxman's staff they indicated that in some cases there is no haircut for revenue neutrality. Correspondence with CBO below and report Terry mentions confirms that in some cases--e.g. if allowances given away for free they would apply no haircut believing this would not affect tax revenue. I have a hard time following the logic they use....but if CBO or JCT would actually apply no haircut, if the revenue is being returned via tax cuts, does it make more sense to simulate that case? Or assuming the 25% rather than our endogenous calculation?

(Not sure how this will come out in the end, but we had a couple of sets of runs that needed adjustment. In the first set, emissions baseline was too high, but the economic results were that the tax reduced emissions but caused a net loss in welfare--no strong double dividend by using revenue to cut other taxes--but then a relatively large amount of revenue was going to revenue neutrality. Then in a rush before Sebastian left he redid the baseline to get lower emissions-but did so by adjusting labor productivity down--in this set of cases we had strong double dividend effects where substituting the carbon tax for other taxes led to an improvement in welfare. However, the labor productivity adjustment was so large that GDP growth was only .5% per year. Before I noticed that, I shared some results with the Congressional folks but then warned them when I realized what was going on that these might not stick--of course they love the economic benefit of carbon tax. Here I think because economic growth was so slow, tax receipts were growing slowly, and so any impact on taxes was reduced--so a much lower percentage of carbon tax revenue was needed for revenue neutrality. Sebastian is now redoing the runs, trying to get a better baseline--if my diagnosis above is correct then I'm thinking likely back to no strong double dividend, but if we are being excessive with the absolute revenue neutrality, I'd be willing to relax that--relative neutrality?)

Not sure you have time for this but i it is of interest and you have some thoughts I would appreciate it.

John

Begin forwarded message:

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Subject: RE: question
Date: August 9, 2012 12:25:18 PM EDT
To: John M Reilly (b)(6) @mit.edu(b)(6) @mit.edu>>

Hi John,

It is actually JCT, not CBO, that would score a carbon tax. I can't speak for them (or even for CBO!) but I think the logic that they would apply would be consistent with the logic that CBO would applies when determining whether or not an offset (i.e., the haircut) is, or is not, applicable to a cap-and-trade program. (The purpose of the offset is to reflect the net effect of policy on the budget under the assumption that output remains constant, a standard assumption in scoring bills. For example, holding output constant, a carbon tax or cap-and-trade program would reduce taxable incomes in a manner that would lower revenues collected by other taxes. The main question, then, is whether the carbon tax revenues are used in a manner that would offset that reduction that would otherwise occur, that is whether or not the use of the revenue would "offset the offset"...you can imagine how fun this is to explain to folks!)

The attached document lays out the logic and will hopefully answer your questions. But, as I said, JCT would be the ultimate arbiter.

Hope this is helpful.

Terry

_____
From: John M Reilly (b)(6) @MIT.EDU<(b)(6) @MIT.EDU>]
Sent: Wednesday, August 08, 2012 4:22 PM
To: Terry Dinan
Cc: Rausch Sebastian
Subject: Re: question

Terry,

Now here's a question for you. We are talking to House Energy/Commerce, Waxman folk on their possible interest in a carbon tax as a solution to deficit reduction. I understand they are trying to get CBO to do an analysis of this as well. A question has come up as to how CBO would score the budget impacts, particularly (in your/their lingo) the haircut you would take for revenue neutrality. They discussed a fairly complex set of rulings in the past where depending on what the tax revenue was used for led to different requirements on whether or not their would be a "haircut". They suggested that if they were using carbon tax revenue to reduce other tax rates (personal income, corporate, payroll) from past experience they thought CBO would not apply a haircut, whereas if they were using the money to maintain transfer payments then you probably would require a haircut.

Any thoughts you might share on this? I realize you are likely not in position to commit to exactly what CBO might do, but if there is something we could refer to where CBO has scored differently depending on the use of the revenue, we could at least refer to that as a motivation for using a different haircut rate.

John

On Aug 6, 2012, at 11:36 AM, Terry Dinan wrote:

Thanks Sebastian (and John). I'll take a look at each of these. Terry

From: Rausch Sebastian [(b)(6)@ethz.ch]
Sent: Monday, August 06, 2012 11:11 AM
To: Terry Dinan
Cc: John M Reilly
Subject: Re: Fwd: question

Hi Terry,

You want to look at the following two studies:

Report 185.
Distributional Implications of Alternative U.S. Greenhouse Gas Control Measures Rausch, S., G.E. Metcalf, J.M. Reilly and S. Paltsev, Joint Program Report Series (June 2010)
http://globalchange.mit.edu/research/publications/2065

and

Report 202
Distributional Impacts of Carbon Pricing: A General Equilibrium Approach with Micro-Data for Households<http://globalchange.mit.edu/research/publications/2168>
Rausch, S., G. Metcalf, J. M. Reilly, Joint Program Report Series<http://globalchange.mit.edu/pubs/all-reports.php> (July 2011)
http://globalchange.mit.edu/research/publications/2168

Report 185 looks at GHG control policies closely related to the Waxman-Markey proposal. Report 202 investigates the impacts of a $20 carbon tax. Both studies decompose the impacts of carbon pricing into the uses side of income (i.e., how consumers spend their income) and the sources side of income (i.e., how consumer derive their income) effects.

Our general finding is that sources side of income effects from carbon pricing are progressive because higher-income households derive a larger fraction of their income from capital and labor income as compared to lower-income households (and relative returns to capital fall). In addition, if government transfers (social security, unemployment benefits etc.) are indexed to inflation---which is the case for roughly 95% of government transfer payments to households in the US---lower-income households are insulated from adverse shocks on factor income as they derive a relatively large share of their income from transfers. Therefore, neglecting uses side of income effects, as many traditional analyses have done, overestimates the regressivity of a carbon pricing policy.

Let me know if you have any questions.

Sebastian

Am 03.08.2012 03:57, schrieb John M Reilly:
Can you send on reference to best paper on this. Terry is a great person in us gov.

Sent from my iPhone

Begin forwarded message:

From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
Date: August 2, 2012 1:39:41 PM MDT
To: (b)(6)@mit.edu(b)(6)@mit.edu>" (b)(6)@mit.edu<(b)(6)@mit.edu>>
Subject: question

Hi John,

I'm trying to pull together studies that provide information about how a U.S. carbon tax might affect relative returns to capital and labor. I was wondering if you could please tell me which MIT studies I should look at to get your best/most recent insights with respect to this question.

Thanks very much! Hope you are well.

Terry

Terry M. Dinan
Senior Advisor
Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>
(202)226-2927

--

Prof. Dr. Sebastian Rausch

CEPE - Centre for Energy Policy and Economics

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CONGRESSIONAL BUDGET OFFICE
U.S. Congress
Washington, DC 20515

Douglas W. Elmendorf, Director

May 15, 2009

Honorable Henry A. Waxman
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

The potential introduction of carbon cap-and-trade policies raises complicated questions about how those policies might be reflected in the federal budget. In response to such questions, the Congressional Budget Office (CBO) has prepared the enclosed description of how it plans to assess those budgetary impacts. Federal legislation to limit the emission of greenhouse gases (GHGs) through the issuance of tradable allowances effectively would create a new type of financial instrument of significant value and liquidity. The document explains CBO's view that the value of such allowances—whether auctioned or freely distributed—should be recorded on both the revenue and outlay sides of the federal budget. It also describes CBO's position regarding the circumstances in which net revenue from the allowances would be less than the value of the allowances themselves because of a so-called "revenue offset." The examples used to illustrate various possible budgetary outcomes involve electric generating companies and local distribution companies (LDCs), which have been a focus of your and other policymakers' recent discussions.

I hope this information is helpful to you. If you have any questions or concerns, I would be happy to discuss them with you. The CBO staff contacts on this subject are Frank Sammartino, who can be reached at 226-2680, and Theresa Gullo, who can be reached at 226-2800.

Sincerely,

Douglas W. Elmendorf

Enclosure

cc: Honorable Joe Barton
Ranking Member

Congressional Budget Office

The Budgetary Treatment of Emission Allowances Under Cap-and-Trade Policies

The potential introduction of carbon dioxide cap-and-trade policies raises complicated questions about how those policies might be reflected in the federal budget. Federal legislation to limit the emission of greenhouse gases (GHGs) through the issuance of tradable allowances effectively would create a new type of financial instrument of significant value and liquidity. This letter explains the Congressional Budget Office's (CBO's) view that the value of such allowances—whether auctioned or freely distributed—should be recorded on both the revenue and outlay sides of the federal budget. The letter also describes CBO's position regarding the circumstances in which the government's net revenues from the allowances would be less than the value of the allowances themselves because of a so-called revenue offset. The examples used to illustrate various possible budgetary outcomes involve electric generating companies and local distribution companies (LDCs), which have been a focus of policymakers' recent discussions.

Tradable Emission Allowances and the Federal Budget

When considering the appropriate budgetary treatment for new federal activities, CBO relies heavily on the guidance provided by the 1967 *Report of the President's Commission on Budget Concepts*. The commission recommended that the federal budget be "comprehensive of the full range of federal activities. Borderline agencies and transactions should be included in the budget unless there are exceptionally persuasive reasons for exclusion."

Clearly, federal efforts to control GHG emissions through a cap-and-trade system would be promulgated and enforced through the government's sovereign powers and would alter the usage of scarce economic resources. Under recent cap-and-trade proposals, the federal government would determine both the scope of covered emissions and the number of allowances to be issued. Moreover, the allowances would be traded in a large and liquid secondary market, which would make them "cash-like" in nature.

Under those circumstances, the distribution of allowances by the federal government would be essentially equivalent to the distribution of cash grants, so CBO believes that such distributions should be treated as outlays. At the same time, allowances in a cap-and-trade system would be valuable financial instruments, so CBO thinks that the creation of allowances by the federal government should be recorded as revenues.

That logic does not hinge on whether the federal government sells or, instead, gives away the allowances. Allowances would have significant value even if given away because the recipients could sell them or, if they are carbon dioxide emitters, use them to avoid incurring the cost of purchasing allowances or investing in costly emission mitigation mechanisms. Therefore, selling the allowances and giving entities cash, and giving

entities the allowances themselves and letting the entities realize their value, are essentially the same transaction. Sound budgeting requires that the budget treat equivalent transactions in the same way.

Consider the following examples. In each, an electric generating company is allowed to generate $100 worth of emissions, an LDC receives $100 in cash, and the government's financial position is unchanged (except for subsequent indirect effects on tax collections, as discussed below):

- The government sells a $100 allowance to an electric generating company and gives the money to an LDC.

- The government imposes an emission tax of $100 on an electric generating company and gives the money to an LDC.

- The government gives a $100 allowance to an LDC, which sells it to an electric generating company for $100.

In the first and second examples, the government budget would clearly show an additional $100 in revenues and $100 in outlays. Because the third example is an equivalent transaction, it should be recorded the same way in the budget.

Some might question why the cap-and-trade method of regulating emissions should warrant inclusion in the federal budget, while other methods such as directly controlling GHGs through requiring the use of different technology or mitigation systems would not. A fundamental difference is that cap-and-trade systems create cash-like assets whose supply is determined by the government, while command-and-control approaches do not.

Potential Offsets to Revenues from Emission Allowances

Under cap-and-trade proposals, the cost of purchasing emission allowances would become an additional business expense for companies that must comply with the cap. These additional expenses could result in decreases in taxable income somewhere in the economy, which could produce a loss in government revenue that would partially offset the revenue from the allowances themselves.[1]

Consider an electricity generator that purchases $100 worth of allowances from the federal government:

- If the generator could not pass that expense on to its customers, its profits and therefore taxable income would decline by $100. On average, the tax on additional income (across businesses and households) is roughly 25 percent. By long-standing convention, CBO, the Joint Committee on Taxation, and the

[1] For a further explanation of revenue offsets, see Congressional Budget Office, *The Role of the 25 Percent Revenue Offset in Estimating the Budgetary Effects of Legislation* (January 13, 2009), available at http://www.cbo.gov/ftpdocs/96xx/doc9618/01-13-25PercentOffset.pdf.

Treasury Department would apply that 25-percent tax rate to the $100 income decline and estimate that income and payroll tax revenue would fall by $25. This "revenue offset" means that the net additional revenues collected under the cap-and-trade system would be $100 minus $25, or $75.

- Alternatively, if the generator could pass that expense on to its customers by raising prices, its profits would be unchanged. However, since consumers would spend $100 more on electricity due to the higher prices, they would have $100 less to spend on other goods. As a result, the profits and wages received by producers of those other goods would fall by $100. Again, that drop of $100 in taxable income would reduce the federal government's tax receipts by $25 and net additional revenues under the cap-and-trade system to $75.

The situation is complicated further because cap-and-trade proposals often include provisions to return some or all of the proceeds from the sale of emission allowances to individuals and businesses. Depending on the manner in which the proceeds are conveyed to private entities, the reduction in taxable income in the preceding examples (the "revenue offset") might be accompanied by a matching increase in taxable income elsewhere in the economy. In these cases, CBO would view the distribution of the allowance proceeds as creating an "offsetting offset" that would compensate for the initial loss of tax revenues from the sale of the allowances and make the net revenue from that sale equal to the value of the allowances themselves. (Although it may appear that this terminology is deliberately confusing, it is chosen to be consistent with the long-standing treatment of revenue offsets.)

Again, some examples may help illuminate the situation:

- If the government took $100 received from selling allowances and gave it to a taxable entity in a manner that increased its taxable income, that higher income would generate $25 in additional tax revenue. The tax receipts gained through this method of "recycling" of the auction revenue would equal the $25 tax loss created when generators needed to purchase allowances from the government. The revenue offset would have an offsetting offset, so the net change in revenue would be the $100 gained from selling allowances. (The net change in the government's outlays would also be $100, and the outcome would not affect the budget deficit.)

- If the government took $100 received from selling allowances and gave it away in a manner that did not increase some entity's taxable income, there would be no gain in tax revenue to offset the $25 decrease in tax collections caused by the added cost to generators. The net revenue offset would be $25, and the government's net revenue gain from the sale and distribution of allowances would be $75. (Outlays would rise by $100.) Examples of government uses of the money that would not increase taxable incomes include:

    - Revenue given to non-taxable entities, such as low-income households.

- Direct government expenditures of $100 on goods and services, such as research and development, or weatherization projects. Under the assumption governing CBO budget estimates that legislation does not affect the size of the economy—a topic to which we return shortly—the government's purchases of goods and services would displace other spending in the economy and would not cause a net increase in income.

- Revenue given to other entities with instructions that they use it in particular ways, such as for research and development or weatherization projects. This approach would be equivalent to the government paying for those items directly.

Fixed Nominal GDP and Revenue Offsets

It may seem inconsistent that providing money to businesses or households in certain ways—such as taxable transfers—is assumed to raise overall taxable income, but that providing money to them in other ways—such as purchases of goods—does not. Yet, this result is consistent with long-standing budget conventions and economic logic.

When CBO estimates the effect of proposed legislation on revenues and outlays, it assumes that the legislation would not affect nominal or real (inflation-adjusted) gross domestic product (GDP). One reason for this assumption is that the effects of legislation on overall economic output and prices are quite uncertain and depend upon the underlying level of economic activity. If the economy is at full employment, additional spending may primarily increase prices, but if there is slack in the economy, additional spending may increase real employment and earnings. (In the former case, assessing the full budgetary impact of a proposal would require estimates of the effect of higher prices on outlays through entitlement programs and on discretionary outlays that aimed to support government programs at a given inflation-adjusted level.) In addition, the effect of legislation on the economy depends on the policy of the Federal Reserve, which is trying to stabilize economic activity and keep inflation low. The Fed might respond to legislation that tended to change nominal GDP in a manner that kept the economy close to the same level of output and prices. Another reason for the assumption of fixed GDP is to maintain consistency across the treatment of different legislation. If assumptions about the underlying level of economic activity were constantly changing as legislation was introduced and enacted, the cost of proposals would depend upon whether other legislation had already been introduced.

Further Examples of Revenue Offsets for Emission Allowances

In CBO's view, giving away allowances is equivalent, in economic and budgetary terms, to selling them and giving away the proceeds. Therefore, the concepts of "revenue offsets" and "offsetting offsets" also apply to transactions involving the distribution of allowances at no cost. Further examples below illustrate how CBO would estimate the budgetary impact of giving away cap-and-trade emission allowances. These examples involve giving away allowances to electricity generators and local distribution

companies. In all of these examples, electricity generators are assumed to need $100 of allowances to cover their emissions.

In some cases, the revenue offset caused by the issuance of allowances would have an offsetting offset, which means that the revenue from the allowances would equal $100, the value of the allowances themselves, and the overall proposal would be budget neutral ($100 in revenues versus $100 in outlays for giving away the allowances). Examples include:

- Allowances worth $100 are given to LDCs, which sell the allowances to electricity generators and use the proceeds to counteract the price increases that consumers would otherwise face. Counteracting the price increases can take the form of reductions in the charges per kilowatt-hour of electricity or a fixed-dollar credit or rebate on the electricity bill. In that case, generators would increase their electricity prices to reflect the cost of the allowances and therefore have no change in their taxable income. The LDCs would have no net change in their income, and consumers would face the same total cost of electricity as before the proposal was enacted. Overall taxable income would be unaffected by the policy.

- Allowances worth $100 are given to generators of electricity that operate in markets where pricing is governed by competitive forces (rather than by regulation). The cap on emissions would increase the marginal cost to some producers of generating electricity, and the marginal cost of the highest-cost producer is what determines prices in a competitive market; therefore, generators in competitive markets could sell electricity at a higher price. The generators' profits would be $100 higher because they received the allowances for free but were able to raise their prices, but consumers would have $100 less to spend on other goods and services, leading to $100 less taxable income somewhere in the economy. Again, overall taxable income would be unaffected by the policy.

In other cases, the revenue offset caused by the issuance of allowances would not have an offsetting offset, which means that the net revenue from the allowances would be $75, less than the value of the allowances themselves, and the overall proposal would not be budget neutral (yielding $75 in net revenues versus $100 in outlays for giving away the allowances). An example is:

- Allowances worth $100 are given to LDCs, which sell the allowances to electricity generators and use the proceeds to finance household weatherization projects. Because this case is especially complex, we first discuss the effects apart from the weatherization projects and then discuss the effects of those projects.

  Leaving aside the weatherization projects, generators would increase their electricity prices to reflect the cost of the allowances and have no change in their taxable income. The LDCs also would see no net change in their income. However, consumers' electricity expenditures would increase by $100, so they would spend less on other goods and services, leading to $100 less taxable income

somewhere in the economy. Nominal GDP would be unchanged through this substitution: More GDP in the electricity sector because of higher prices, and less in other sectors through lower prices there. But taxable income would decline by $100, and tax revenues would fall by $25.

The remaining piece is the extra spending on weatherization projects by the LDCs. This is assumed, by the logic described above, to be offset by lower spending on something else to keep nominal GDP unchanged, so that spending would induce no change in overall taxable income. Thus, the reduction in taxable income due to the higher electricity prices would be the only change affecting tax receipts, and federal revenues would fall by $25.

One might argue that this example is similar to the previous example in which the LDCs kept consumers' electricity prices from rising (and in which federal revenues did not fall) because both involve giving resources back to consumers. However, this example differs from the earlier one due to the increase in electricity prices that, by the assumption of fixed nominal GDP, must be offset by lower spending elsewhere in the economy. Put differently, making resources available for other spending is not comparable in its effect on overall output and income to preventing a price increase for existing spending.

These examples are conceptual in nature. CBO's determination of the net budgetary consequences of a cap-and-trade program would depend on the specific language of proposed legislation. If legislation allocated allowances to LDCs but did not provide explicit instructions about the use of the revenue from selling the allowances, then CBO would make a judgment call about the likely use of the revenue. To inform that judgment, CBO would consult with LDCs and their regulators to gain a better understanding of how they would probably proceed under those circumstances. Based on those consultations, CBO would estimate what fraction of the allowance receipts would be spent in ways that would result in a budget-neutral outcome (that is, an increase in income and payroll tax collections that would offset the loss of tax revenues from the issuance of the allowances) and what fraction would be spent in ways that did not result in an increase in other tax collections and thus would not be budget neutral.

May 15, 2009

JOINT COMMITTEE ON TAXATION
March 6, 2012
JCX-23-12

NEW INCOME AND PAYROLL TAX OFFSETS TO CHANGES IN EXCISE TAX REVENUES FOR 2012-2022[1]

Table 1, below, presents the new income and payroll tax offsets that the staff of the Joint Committee on Taxation ("Joint Committee staff") will apply in its economic models of proposed changes in Federal excise taxes during the second session of the 112th Congress. The Joint Committee staff explained the methodology underlying these estimates in a prior publication.[2]

The new offsets are calculated on a calendar year by year basis. The new income and payroll tax offsets will be applied to excise tax estimates instead of the previous 25 percent offset that the Joint Committee staff has historically used. Generally, these offsets will be applied to calendar year excise tax effects and then fiscalized. With this publication the Joint Committee staff plans to start using these offsets exclusively. The calculated offsets include the effects of the extension of the payroll tax reduction through the end of calendar year 2012.[3]

Table 1. Income and Payroll Tax Offsets Under Present Law Baseline 2012 Through 2022

Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Income and Payroll Excise Tax Offsets	0.244	0.269	0.273	0.277	0.284	0.286	0.290	0.292	0.295	0.296	0.298

[1] This document may be cited as follows: Joint Committee on Taxation, *New Income and Payroll Tax Offsets to Changes in Excise Tax Revenues for 2012-2022* (JCX-23-12), March 6, 2012. This document can be found on our website at www.jct.gov.

[2] Joint Committee on Taxation, *The Income and Payroll Tax Offset to Changes in Excise Tax Revenues* (JCX-59-11), December 23, 2011.

[3] At publication legislation related to funding the Highway Trust Fund is before the House of Representatives and the Senate. Development of that legislation has relied upon estimates using the older methodology of a constant 25-percent offset throughout the 2012 - 2022 budget period. The Joint Committee staff will continue to apply the older methodology in analysis of provisions related to Congress's deliberation of this legislation.

The estimated income and payroll excise tax offset for 2012 is indeed very close to the standard offset factor of 25 percent. However, many tax reductions enacted in 2001 and 2003 are set to expire at the end of 2012. With the expiration of these tax cuts, the marginal rates applicable for different factors of production will increase and 25 percent will be an underestimate of the appropriate income and payroll tax offset.

The offsets calculated above take into account both the changes in tax rates that have been legislated to occur over the budget window, as well as adjustments to the taxable portion of income consistent with the current Congressional Budget Office macroeconomic forecast.[4] As can be seen from the table, adjusting the income and payroll tax offset for the changes in the tax rates raises the offset from 24.4 percent in 2012 to 29.8 percent in 2022.[5]

[4] For the calculation of the taxable amount of income factors, other than the corporate calculation, the NIPA forecasts are from CBO, and the taxable portions are from the Joint Committee staff individual income tax model. The corporate taxable portion is held constant at the 2007 level. See *The Budget and Economic Outlook: Fiscal Years 2012 to 2022*, January 2012, Washington DC, http://www.cbo.gov/publication/42905.

[5] The lower rate in 2012 reflects the effects of the temporary two percentage point payroll tax reduction.

From: Metcalf, Gilbert
To: Bonaiuto, Matthew; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth)
Subject: RE: next draft of OECD ppt for your review
Date: Friday, May 18, 2012 3:56:00 PM
Attachments: (b)(5) [redacted]

Matt,
I made some changes in the AGF slide (and reversed the order of the two carbon tax slides). Can you strip out the notes and put in a word document table that has two columns. Column 1 gives the slide number and column 2 the notes from the PP file. Then you can send the PP file (with no notes) to OECD and send file and notes back to me. Thanks very much for your help.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Bonaiuto, Matthew
Sent: Friday, May 18, 2012 3:25 PM
To: Metcalf, Gilbert; Hall, Daniel
Cc: Urbanas, Elizabeth (Beth)
Subject: next draft of OECD ppt for your review

Please let me know if I've got what you were aiming to capture, particularly on slide 10. Thanks!

Matt Bonaiuto | Office of Environment & Energy | International Affairs division | U.S. Department of Treasury | on loan from U.S. Dept of State | matthew.bonaiuto@treasury.gov | tel: 202-622-9352 | **Do not print this email unless necessary.**

From: Jaffe, Judson
To: Metcalf, GilbertDisabled; Hall, Daniel
Subject: RE: NZ cap and trade
Date: Sunday, March 25, 2012 10:30:01 PM
Attachments: (b) (5) [redacted]

Gib,

Here are some summary points. I'll be on email tomorrow morning, so let me know if you have any follow-up questions before your meeting.

Jud

-----Original Message-----
From: Metcalf, Gilbert
Sent: Friday, March 23, 2012 8:17 PM
To: Jaffe, Judson; Hall, Daniel
Subject: NZ cap and trade

Can one of you shoot me an email with a brief summary of NZ's cap and trade program by Monday morning? (b)(5) [redacted] I am meeting with their climate change special envoy Monday at 9:30 and want to be vaguely conversant with it. Apologies for the late tasking but the meeting got set up today.
Thanks.
Gib
Gilbert E. Metcalf
Deputy Assistant Secretary
For Environment & Energy
US Treasury

From:	John M Reilly
To:	Jaffe, Judson
Cc:	Metcalf, GilbertDisabled
Subject:	Re: question
Date:	Monday, August 13, 2012 9:02:17 AM
Attachments:	A Carbon Tax2_SR08092012.docx

Judson, Gib,

Thanks for information. I think the key here is the difference between what is done and what you point out is dynamic scoring. We now have some interesting results. As I noted, we were not well benchmarked in earlier runs, but we have now fixed that and have GDP matching EIA projections and emissions path similar--a bit higher. We are still getting the positive effects of carbon tax/tax cut on welfare, though very small. But it still seems like a strong story to me. We continue to enforce endogenous absolute revenue neutrality. I have just added a caveat paragraph in the final section of the paper, noting that this may be scored differently by the Joint Commission on Taxation if there were an actual bill. I think the relative results are mostly as one might expect--though I was bit surprised that they remain positive--a strong double dividend effect. And the other aspect that we saw in all of the earlier results (when baseline not well-calibrated) that using revenue to offset possible reductions in transfer payments actually improves welfare the most in the nearer term. The explanation is that this is transferring money from wealthier households that were more likely to save to lower income household that would spend on consumption. And, in a static (dynamic recursive) setting that is taking money from investment which makes no immediate welfare contribution to consumption where it does. Of course ultimately the reduced investment has a cost.

We will be trying to get this out this week. If you have any comments, let us know.

john

On Aug 12, 2012, at 10:04 PM, <Judson.Jaffe@treasury.gov>
wrote:

> John,
>
> On the level of the offset, you might be interested in the updated JCT numbers, which CBO apparently adopted too (attached as "x-23...pdf" and at: https://www.jct.gov/publications.html?func=showdown&id=4406). As you'll see, the numbers increase over time from 24.4% in 2012 to 29.8% in 2022, reflecting the scheduled increase in statutory tax rates if there are no new laws.
>
> I've also attached a letter that CBO sent to Waxman's staff in 2009 on the scoring of cap-and-trade in case it has helpful additional detail beyond the CBO report that you sent Gib.
>
> Regarding the fact that your estimates of the offset exceed 25%, I think a big piece of what you're picking up is that your model presumably captures BOTH changes in taxable income holding constant economic activity (which is the focus of the CBO/JCT offset), AND also the overall change in economic activity associated with higher tax rates. As you may be familiar with, capturing the latter effect is referred to as "dynamic scoring" in budget scoring lingo. CBO and JCT explicitly do not use dynamic scoring--there has been a long-standing debate about this though. The CBO/JCT offset only captures the former effect. Reference to dynamic scoring can be found at page 3 of the CBO report that you sent Gib. Consistent with your finding, CBO states that "those macroeconomic 'dynamic' effects would go in the same direction as the offset." (i.e., they would have gotten a higher offset estimate too if they factored in these effects)
>
> Regarding the instances where CBO doesn't apply the offset (or applies the "offsetting offset"), I think it's easiest to describe those circumstances as ones where allowance value is recycled in a way that makes that value taxable, rather than nontaxable, income. For example, imagine a cap-and-trade program's effect on taxable income from a coal-fired power plant. For this example, assume the plant is

sufficiently efficient that its generation output is unchanged by the cap-and-trade policy.
>
> - If allowances are auctioned, the coal plant's taxable income will decline by the value of allowances that it has to acquire at auction (i.e., by the amount that its expense go up). Corporate tax receipts from that plant will decline accordingly (i.e., there should be an offset).
>
> - If the allowances are instead freely allocated to that coal plant (and others), that coal plant's taxable income will be unchanged relative to the no-policy baseline (in fact, its taxable income may rise due to higher electricity prices, but let's put that aside). As a result, in this allocation scenario, corporate tax receipts from that coal plant are unchanged relative to the no-policy baseline (i.e., there should be no offset, or an "offsetting offset" should be applied).
>
> - Finally, if allowances are auctioned and auction receipts are used to lower corporate tax rates, the coal plant's taxable income would still decline by the value of the allowances it had to acquire at auction (i.e., there should be an offset). The fact that the auction receipts are then used to reduce corporate income tax rates does not undo the cap-and-trade program's effect on the coal plant's taxable income (i.e., there should still be an offset). Instead, this use of the auction receipts just leads to application of a lower tax rate on the remaining taxable income. As this last example shows, if receipts from the new policy you are modeling are recycled through lower tax rates there should still be a need for the offset, and I believe CBO/JCT would score this accordingly.
>
> If the difference between your endogenous offset estimate and the CBO/JCT offset is not substantial, I would be inclined to just leave it and note that you're picking up dynamic effects in addition to the standard effects that CBO/JCT capture in their offset. Alternatively, perhaps you could see how different your estimates are relative to the CBO/JCT offset, and simply relax your constraint on government receipts to match that.
>
> Jud
>
>
> -----Original Message-----
> From: Metcalf, Gilbert
> Sent: Saturday, August 11, 2012 8:07 AM
> To: Jaffe, Judson; (b)(6)@mit.edu'
> Subject: Fw: Fwd: question
>
> John,
> There are two issues: how much other revenues decline and how to score for budget neutrality purposes. Your model can measure the first but you need to follow the scoring rules for determining the amount of revenue you can offset with carbon tax. So it seems to me that you would use the 25 percent haircut for the latter.
>
> On haircut treatment, I understand CBO made very subtle distinctions in the cap and trade context depending on allowance treatment. But a carbon tax is an excise tax and I am not sure that those distinctions persist in the tax context. I am copying Jud Jaffe in my office in hopes he may have more info on this. Jud: you might want to check with Curtis as well.
> Gib
> Gilbert E. Metcalf
> Deputy Assistant Secretary
> For Environment & Energy
> US Treasury
>
> ----- Original Message -----
> From: John M Reilly [(b)(6) @MIT.EDU]
> Sent: Thursday, August 09, 2012 01:31 PM
> To: Metcalf, Gilbert
> Subject: Fwd: question
>
> Gib,
>

> i think we discussed idea that we would try to look at the issue of using a carbon tax as part of solving budget problems. Do you have any thoughts on what would be useful for re: revenue neutrality. We can impose absolute revenue neutrality but we tend to require more than the 25% standard that the budget counters at CBO/JCT would require. And then in talking with Waxman's staff they indicated that in some cases there is no haircut for revenue neutrality. Correspondence with CBO below and report Terry mentions confirms that in some cases--e.g. if allowances given away for free they would apply no haircut believing this would not affect tax revenue. I have a hard time following the logic they use....but if CBO or JCT would actually apply no haircut, if the revenue is being returned via tax cuts, does it make more sense to simulate that case? Or assuming the 25% rather than our endogenous calculation?
>
> (Not sure how this will come out in the end, but we had a couple of sets of runs that needed adjustment. In the first set, emissions baseline was too high, but the economic results were that the tax reduced emissions but caused a net loss in welfare--no strong double dividend by using revenue to cut other taxes--but then a relatively large amount of revenue was going to revenue neutrality. Then in a rush before Sebastian left he redid the baseline to get lower emissions-but did so by adjusting labor productivity down--in this set of cases we had strong double dividend effects where substituting the carbon tax for other taxes led to an improvement in welfare. However, the labor productivity adjustment was so large that GDP growth was only .5% per year. Before I noticed that, I shared some results with the Congressional folks but then warned them when I realized what was going on that these might not stick--of course they love the economic benefit of carbon tax. Here I think because economic growth was so slow, tax receipts were growing slowly, and so any impact on taxes was reduced--so a much lower percentage of carbon tax revenue was needed for revenue neutrality. Sebastian is now redoing the runs, trying to get a better baseline--if my diagnosis above is correct then I'm thinking likely back to no strong double dividend, but if we are being excessive with the absolute revenue neutrality, I'd be willing to relax that--relative neutrality?)
>
> Not sure you have time for this but i it is of interest and you have some thoughts I would appreciate it.
>
> John
>
> Begin forwarded message:
>
> From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
> Subject: RE: question
> Date: August 9, 2012 12:25:18 PM EDT
> To: John M Reilly (b)(6) @mit.edu<(b)(6) @mit.edu>>
>
> Hi John,
>
> It is actually JCT, not CBO, that would score a carbon tax. I can't speak for them (or even for CBO!) but I think the logic that they would apply would be consistent with the logic that CBO would applies when determining whether or not an offset (i.e., the haircut) is, or is not, applicable to a cap-and-trade program. (The purpose of the offset is to reflect the net effect of policy on the budget under the assumption that output remains constant, a standard assumption in scoring bills. For example, holding output constant, a carbon tax or cap-and-trade program would reduce taxable incomes in a manner that would lower revenues collected by other taxes. The main question, then, is whether the carbon tax revenues are used in a manner that would offset that reduction that would otherwise occur, that is whether or not the use of the revenue would "offset the offset"...you can imagine how fun this is to explain to folks!)
>
> The attached document lays out the logic and will hopefully answer your questions. But, as I said, JCT would be the ultimate arbiter.
>
> Hope this is helpful.
>
> Terry
>
>

> _____
> From: John M Reilly [(b)(6) @MIT.EDU<(b)(6) @MIT.EDU>]
> Sent: Wednesday, August 08, 2012 4:22 PM
> To: Terry Dinan
> Cc: Rausch Sebastian
> Subject: Re: question
>
> Terry,
>
> Now here's a question for you. We are talking to House Energy/Commerce, Waxman folk on their possible interest in a carbon tax as a solution to deficit reduction. I understand they are trying to get CBO to do an analysis of this as well. A question has come up as to how CBO would score the budget impacts, particularly (in your/their lingo) the haircut you would take for revenue neutrality. They discussed a fairly complex set of rulings in the past where depending on what the tax revenue was used for led to different requirements on whether or not their would be a "haircut". They suggested that if they were using carbon tax revenue to reduce other tax rates (personal income, corporate, payroll) from past experience they thought CBO would not apply a haircut, whereas if they were using the money to maintain transfer payments then you probably would require a haircut.
>
> Any thoughts you might share on this? I realize you are likely not in position to commit to exactly what CBO might do, but if there is something we could refer to where CBO has scored differently depending on the use of the revenue, we could at least refer to that as a motivation for using a different haircut rate.
>
> John
>
>
>
>
> On Aug 6, 2012, at 11:36 AM, Terry Dinan wrote:
>
> Thanks Sebastian (and John). I'll take a look at each of these. Terry
>
> From: Rausch Sebastian [(b)(6) @ethz.ch]
> Sent: Monday, August 06, 2012 11:11 AM
> To: Terry Dinan
> Cc: John M Reilly
> Subject: Re: Fwd: question
>
> Hi Terry,
>
> You want to look at the following two studies:
>
> Report 185.
> Distributional Implications of Alternative U.S. Greenhouse Gas Control Measures Rausch, S., G.E. Metcalf, J.M. Reilly and S. Paltsev, Joint Program Report Series (June 2010)
> http://globalchange.mit.edu/research/publications/2065
>
> and
>
> Report 202
> Distributional Impacts of Carbon Pricing: A General Equilibrium Approach with Micro-Data for Households<http://globalchange.mit.edu/research/publications/2168>
> Rausch, S., G. Metcalf, J. M. Reilly, Joint Program Report Series<http://globalchange.mit.edu/pubs/all-reports.php> (July 2011)
> http://globalchange.mit.edu/research/publications/2168
>
> Report 185 looks at GHG control policies closely related to the Waxman-Markey proposal. Report 202 investigates the impacts of a $20 carbon tax. Both studies decompose the impacts of carbon pricing into the uses side of income (i.e., how consumers spend their income) and the sources side of income (i.e.,

how consumer derive their income) effects.
>
> Our general finding is that sources side of income effects from carbon pricing are progressive because higher-income households derive a larger fraction of their income from capital and labor income as compared to lower-income households (and relative returns to capital fall). In addition, if government transfers (social security, unemployment benefits etc.) are indexed to inflation---which is the case for roughly 95% of government transfer payments to households in the US---lower-income households are insulated from adverse shocks on factor income as they derive a relatively large share of their income from transfers. Therefore, neglecting uses side of income effects, as many traditional analyses have done, overestimates the regressivity of a carbon pricing policy.
>
> Let me know if you have any questions.
>
> Sebastian
>
>
> Am 03.08.2012 03:57, schrieb John M Reilly:
> Can you send on reference to best paper on this. Terry is a great person in us gov.
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> From: Terry Dinan <Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>>
> Date: August 2, 2012 1:39:41 PM MDT
> To: (b)(6) @mit.edu(b)(6) @mit.edu>" (b)(6) @mit.edu<(b)(6) @mit.edu>>
> Subject: question
>
> Hi John,
>
> I'm trying to pull together studies that provide information about how a U.S. carbon tax might affect relative returns to capital and labor. I was wondering if you could please tell me which MIT studies I should look at to get your best/most recent insights with respect to this question.
>
> Thanks very much! Hope you are well.
>
> Terry
>
>
>
> Terry M. Dinan
> Senior Advisor
> Terry.Dinan@cbo.gov<mailto:Terry.Dinan@cbo.gov>
> (202)226-2927
>
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> --
>
> Prof. Dr. Sebastian Rausch
>
> CEPE - Centre for Energy Policy and Economics
>
> ETH Zurich/ZUE
>
> Zürichbergstrasse 18
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> <x-23-12[1].pdf><5-15-waxmanletter[1].pdf>

From:	Metcalf, Gilbert
To:	"Howard, Marjorie C"
Subject:	FW: Tufts Now interview
Date:	Tuesday, February 28, 2012 10:15:00 AM
Attachments:	gib metcalf QA ka.doc

Marjorie,
A few edits attached.
Thanks.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Alaimo, Kara
Sent: Tuesday, February 28, 2012 10:10 AM
To: Metcalf, Gilbert; Wyeth, Natalie
Subject: RE: Tufts Now interview

Minor suggestions tracked in red. Thanks Gib.

-----Original Message-----
From: Metcalf, Gilbert
Sent: Monday, February 27, 2012 3:44 PM
To: Alaimo, Kara
Subject: Tufts Now interview

Kara,
This is for a web-based news outlet at Tufts. I've made a few edits. Let me know if you have other edits so I can get this back to her in a timely fashion.
Thanks.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Howard, Marjorie C (b)(6) @tufts.edu]
Sent: Monday, February 27, 2012 3:00 PM
To: Metcalf, Gilbert; Metcalf, Gilbert E.
Subject:

I've attached the Q&A we plan to run in Tufts Now for your review. As you can see, we've made changes as we have a lay audience which needs a general, conversational approach. We eliminated acronyms wherever possible, for example.

Please let me know if there are any inaccuracies. If you have problems with the style, please tell me your concerns. We won't run this without your approval.

Thanks very much for your help.

Best,

Marjorie

Marjorie Howard
Senior Writer
Tufts University

Hed
Dek

//caption//

By Marjorie Howard

Gilbert E. Metcalf, known as Gib to friends and colleagues, has traded in his syllabus and class assignments for life in the nation's capitol, at least for now. The economics professor is serving as deputy assistant secretary for environment and energy at the U.S. Treasury Department and is on leave from Tufts until September 2013.

Metcalf is no stranger to Washington. Because his ~~current~~ academic work focuses on evaluating policies related to energy and climate change, he ~~is~~ was often asked to testify before Congress and ~~has~~ served as a consultant to a range of organizations before arriving at Treasury.

Comment [GM1]: Wanted to clarify that my testifying occurred before I took on this job. I have not testified in my current role.

As deputy assistant secretary, Metcalf took part in the climate negotiations in Durban, South Africa, last December, ~~where~~ in which 194 countries participated. Metcalf led a U.S. Treasury team in negotiating the new Green Climate Fund, a program through~~in~~ which wealthy countries have promised to help poorer countries cut emissions and adapt to climate change, assisting with flood control, for example.

A Tufts faculty member for 17 years, Metcalf is also a research associate at the National Bureau of Economic Research and for MIT's Joint Program on the Science and Policy of Global Change.

What do you do in your job at Treasury?

I oversee ~~activities that have to do with~~= energy, climate and finance activities. For example, Treasury provides oversight for the United States' involvement in two World Bank environmental trust funds. One is the Global Environment Facility, which helps developing countries address such problems as ocean pollution, climate change and land-use degradation. The other is the Climate Investment Fund, which finances clean energy and climate resilience ~~-~~investments in developing countries.

I'm also involved through the Treasury Department in annual climate negotiations organized by the U.N. Framework Convention on Climate Change. We also lead the U.S. effort to eliminate fossil fuel subsidies agreed to at the G-20 meetings in 2009. My office also participates in reviews of proposed EPA regulations, as well as other domestic energy and carbon-related policy discussions within the administration.

We also work closely with the World Bank and other multilateral development banks on their energy and environmental initiatives, including efforts to integrate development and environmental goals.

What is the federal government doing about climate change?

The administration is committed to international negotiations that result in reduced greenhouse emissions in developed and developing countries alike. In the end, however, each country on its own has to take responsibility for reducing emissions.

The administration has several proposals that will reduce emissions, while also cutting back on oil consumption and adding to our energy security. These include carbon pricing, which means placing a price on carbon through such means as a tax, and the elimination of fossil fuel subsidies. The administration ~~is also seeking~~ has also proposed higher fuel economy standards for cars. In addition, it has offered a clean energy standard that would double the share of electricity from clean sources by 2035.

What was accomplished at the UN climate change summit you attended in South Africa?

While many details still have to be hammered out, the summit established a platform for a future international agreement that could lead to significant emission reductions by both developed and developing countries. More talks will be held in Qatar this December.

More specifically, a plan was developed to have a board in place to govern the Green Climate Fund, a fund that when stood up ~~[the program in which wealthy countries will help~~ will provide climate financing to ~~help~~ poorer countries~~]~~. We felt quite positive about the progress made on the fund at the summit, especially in the areas of private sector engagement and in establishing financial safeguards and standards for the fund. Private sector activity is critical because of the role it plays in financing clean energy internationally.

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Was the Durban agreement good for the United States?

Greenhouse gas emissions are what economists call a global externality, meaning that greenhouse gas emissions anywhere in the world affect people everywhere in the world. The source of emissions is irrelevant for climate change. What matters is the concentration of gases in the atmosphere. For a global pollutant, it is essential to have all major emitters agree to reduce emissions.

The U.S. is committed to an agreement in which all major emitting countries take meaningful actions to reduce emissions. The Durban agreement is a small step in the right direction towards bringing developing countries on board with that goal. That is important, given that China, which attended the conference, has now

surpassed the United States as the leading CO_2 emitter in the world. The other major emitting countries are the United States, India, Russia and the European Union.

How will the Green Climate Fund be paid for during a time of global fiscal upheaval?

It is premature to talk about funding for the Green Climate Fund. Much remains to be done before countries understand exactly how their contributions will be managed and when they will be prepared to pledge to the fund. Assuming the design process for the Green Climate Fund proceeds in a way that gives us and other donor countries confidence that this will be a well-managed and effective fund, the United States and other donor countries will support it.

It is important to note that spending in the budget on environmental funds is not charity. These funds not only improve environmental quality, they provide opportunities for U.S. companies to expand their businesses abroad and—most important—save us money in the future. A World Bank and U.S. Geological Survey study estimates that every dollar spent on disaster preparedness saves seven dollars in response funding. Climate funding will provide for just the sort of disaster preparedness that this study envisions.

What of your government experience will you bring to bear on your teaching at Tufts?

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Having taught classes on the economics of energy markets and on climate policy, I now have a deeper and more nuanced understanding of many of those issues, which should enliven classroom discussions. I also have a growing list of research questions that should provide opportunities for students to pursue their own work, either through classroom research projects or senior theses.

Marjorie Howard can be reached at (b)(6) [redacted] *@tufts.edu*.

From:	Metcalf, Gilbert
To:	Earnest, Natalie W.; Alaimo, KaraDisabled; "Howard, Marjorie C"
Subject:	RE: Tufts Now interview
Date:	Tuesday, February 28, 2012 10:22:00 AM
Attachments:	gib metcalf QA ka.doc

Marjorie,
Can you work from this version. Let me know if you have any questions.
Thanks.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Wyeth, Natalie
Sent: Tuesday, February 28, 2012 10:21 AM
To: Alaimo, Kara; Metcalf, Gilbert
Subject: RE: Tufts Now interview

With one minor edit from me

-----Original Message-----
From: Alaimo, Kara
Sent: Tuesday, February 28, 2012 10:10 AM
To: Metcalf, Gilbert; Wyeth, Natalie
Subject: RE: Tufts Now interview

Minor suggestions tracked in red. Thanks Gib.

-----Original Message-----
From: Metcalf, Gilbert
Sent: Monday, February 27, 2012 3:44 PM
To: Alaimo, Kara
Subject: Tufts Now interview

Kara,
This is for a web-based news outlet at Tufts. I've made a few edits. Let me know if you have other edits so I can get this back to her in a timely fashion.
Thanks.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Howard, Marjorie C [(b)(6) @tufts.edu]

Sent: Monday, February 27, 2012 3:00 PM
To: Metcalf, Gilbert; Metcalf, Gilbert E.
Subject:

I've attached the Q&A we plan to run in Tufts Now for your review. As you can see, we've made changes as we have a lay audience which needs a general, conversational approach. We eliminated acronyms wherever possible, for example.

Please let me know if there are any inaccuracies. If you have problems with the style, please tell me your concerns. We won't run this without your approval.

Thanks very much for your help.

Best,

Marjorie

Marjorie Howard
Senior Writer
Tufts University

Hed
Dek

//caption//

By Marjorie Howard

Gilbert E. Metcalf, known as Gib to friends and colleagues, has traded in his syllabus and class assignments for life in the nation's capitol, at least for now. The economics professor is serving as deputy assistant secretary for environment and energy at the U.S. Treasury Department and is on leave from Tufts until September 2013.

Metcalf is no stranger to Washington. Because his ~~current~~ academic work focuses on evaluating policies related to energy and climate change, he ~~is~~ was often asked to testify before Congress and ~~has~~ served as a consultant to a range of organizations before arriving at Treasury.

Comment [GM1]: Wanted to clarify that my testifying occurred before I took on this job. I have not testified in my current role.

As deputy assistant secretary, Metcalf took part in the climate negotiations in Durban, South Africa, last December, ~~where~~ in which 194 countries participated. Metcalf led a U.S. Treasury team in negotiating the new Green Climate Fund, a program through~~in~~ which wealthy countries have promised to help poorer countries cut emissions and adapt to climate change, assisting with flood control, for example.

A Tufts faculty member for 17 years, Metcalf is also a research associate at the National Bureau of Economic Research and for MIT's Joint Program on the Science and Policy of Global Change.

What do you do in your job at Treasury?

I oversee ~~activities that have to do with~~= energy, climate and finance activities. For example, Treasury provides oversight for the United States' involvement in two World Bank environmental trust funds. One is the Global Environment Facility, which helps developing countries address such problems as ocean pollution, climate change and land-use degradation. The other is the Climate Investment Fund, which finances clean energy and climate resilience ~~-~~investments in developing countries.

I'm also involved through the Treasury Department in annual climate negotiations organized by the U.N. Framework Convention on Climate Change. We also lead the U.S. effort to eliminate fossil fuel subsidies agreed to at the G-20 meetings in 2009. My office also participates in reviews of proposed EPA regulations, as well as other domestic energy and carbon-related policy discussions within the administration.

We also work closely with the World Bank and other multilateral development banks on their energy and environmental initiatives, including efforts to integrate development and environmental goals.

What is the federal government doing about climate change?

The administration is committed to international negotiations that result in reduced greenhouse emissions in developed and developing countries alike. In the end, however, each country on its own has to take responsibility for reducing emissions.

The administration has several proposals that will reduce emissions, while also cutting back on oil consumption and adding to our energy security. These include carbon pricing, ~~which means placing a price on carbon through such means as a tax,~~ and the elimination of fossil fuel subsidies. The administration ~~is also seeking~~ has also proposed higher fuel economy standards for cars. In addition, it has offered a clean energy standard that would double the share of electricity from clean sources by 2035.

What was accomplished at the UN climate change summit you attended in South Africa?

While many details still have to be hammered out, the summit established a platform for a future international agreement that could lead to significant emission reductions by both developed and developing countries. More talks will be held in Qatar this December.

More specifically, a plan was developed to have a board in place to govern the Green Climate Fund, a fund that when stood up ~~[the program in which wealthy countries will help~~ will provide climate financing to ~~help~~ poorer countries~~]~~. We felt quite positive about the progress made on the fund at the summit, especially in the areas of private sector engagement and in establishing financial safeguards and standards for the fund. Private sector activity is critical because of the role it plays in financing clean energy internationally.

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Was the Durban agreement good for the United States?

Greenhouse gas emissions are what economists call a global externality, meaning that greenhouse gas emissions anywhere in the world affect people everywhere in the world. The source of emissions is irrelevant for climate change. What matters is the concentration of gases in the atmosphere. For a global pollutant, it is essential to have all major emitters agree to reduce emissions.

The U.S. is committed to an agreement in which all major emitting countries take meaningful actions to reduce emissions. The Durban agreement is a small step in the right direction towards bringing developing countries on board with that goal. That is important, given that China, which attended the conference, has now

surpassed the United States as the leading CO_2 emitter in the world. The other major emitting countries are the United States, India, Russia and the European Union.

How will the Green Climate Fund be paid for during a time of global fiscal upheaval?

It is premature to talk about funding for the Green Climate Fund. Much remains to be done before countries understand exactly how their contributions will be managed and when they will be prepared to pledge to the fund. Assuming the design process for the Green Climate Fund proceeds in a way that gives us and other donor countries confidence that this will be a well-managed and effective fund, the United States and other donor countries will support it.

It is important to note that spending in the budget on environmental funds is not charity. These funds not only improve environmental quality, they provide opportunities for U.S. companies to expand their businesses abroad and—most important—save us money in the future. A World Bank and U.S. Geological Survey study estimates that every dollar spent on disaster preparedness saves seven dollars in response funding. Climate funding will provide for just the sort of disaster preparedness that this study envisions.

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Marjorie Howard can be reached at marjorie.howard@tufts.edu.

From:	Metcalf, Gilbert
To:	"Howard, Marjorie C"; "Metcalf, Gilbert E."
Cc:	Alaimo, KaraDisabled
Subject:	RE:
Date:	Monday, February 27, 2012 3:09:00 PM
Attachments:	gib metcalf Q&A.DOC

Looping in Kara.

Marjorie: We'll take a look and get back to you soon.
Gib

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6)
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

-----Original Message-----
From: Howard, Marjorie C [mailto:(b) (6) @tufts.edu]
Sent: Monday, February 27, 2012 3:00 PM
To: Metcalf, Gilbert; Metcalf, Gilbert E.
Subject:

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Marjorie Howard can be reached at (b)(6) [redacted] *@tufts.edu.*

From:	Das, Himamauli
To:	Tonkonogy, Bella
Cc:	Das, Himamauli; Demopulos, Abigail; Urbanas, Elizabeth (Beth)Disabled
Subject:	FW: private sector strategy info memo
Date:	Friday, March 16, 2012 5:12:13 PM
Attachments:	(b) (5) [redacted]

Thanks Bella. Please see a couple of suggestions/comments.
Thanks, Him

Himamauli Das / Himamauli.Das@treasury.gov / (202) 622-1147

From: Tonkonogy, Bella
Sent: Friday, March 16, 2012 4:52 PM
To: Das, Himamauli
Cc:
Subject: FW: private sector strategy info memo

Him-

For your clearance, thanks.

From: Metcalf, Gilbert
Sent: Friday, March 16, 2012 4:42 PM
To: Tonkonogy, Bella
Cc: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: RE: private sector strategy info memo

I reworked the summary some. Otherwise no significant changes. Thanks very much.

Gilbert E. Metcalf
Deputy Assistant Secretary for Environment and Energy
U.S. Department of the Treasury
(202) 622-0173 (office)
(b)(6) [redacted]
(202) 622-0037 (fax)
Email: gilbert.metcalf@treasury.gov

From: Tonkonogy, Bella
Sent: Friday, March 16, 2012 4:01 PM
To: Metcalf, Gilbert
Cc: Urbanas, Elizabeth (Beth); Demopulos, Abigail
Subject: private sector strategy info memo

Gib,

Attached is the draft info memo you requested regarding our private sector strategy. Beth has cleared. Will send to Him once we have your clearance.

Thanks,
Bella

Bella Tonkonogy
Office of Environment and Energy
U.S. Department of the Treasury
+1 (202) 622 0766
bella.tonkonogy@treasury.gov

From:	(b)(6) @oecd.org
To:	Tonkonogy, Bella; BrownJS3@state.gov
Cc:	(b)(6) @oecd.org
Subject:	FW: Recent OECD Work on Green Finance and Investment - cancel and replace
Date:	Wednesday, March 21, 2012 12:24:49 PM
Attachments:	OECD Work on Green Finance and Investment 2012 v1.doc Framework plus risk analysis tables B20 input 20032012.doc EGID OlisDocuments2012-03-21_15-42.zip

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Hi Jessica, Bella,

Great to have a chance to follow up. As promised, some links and documents that we discussed today forwarded onto the B20 team are here – they may also be of interest to you:

· 2 pg update of key tables from the forthcoming paper on an integrated domestic policy framework for green infrastructure investment (focus on climate change) and 2-part "risk table"; a new version of the policy framework paper from which these tables come will be available early April – but Nov 2011 version can be found on our website – see here:

o Towards a Policy Framework for Low-Carbon, Climate-Resilient Infrastructure Investment<http://www.oecd.org/dataoecd/53/42/49184842.pdf> (consultation draft of a forthcoming OECD report– your comments are welcome!)

· A summary document covering recent OECD work on Green Finance, Investment in Infrastructure and Other Related Topics.
It covers topics such as: Mobilising Finance and Investment for Green Infrastructure; a policy framework for green infrastructure investment; Institutional investors and innovative mechanisms to finance green growth; Subsidy reform and carbon markets as a new source of finance; Trade and the environment; OECD Environmental Outlook to 2050; Green Growth in the Energy Sector; Country-tailored Policy Surveillance; Delivering Green Growth by Fostering Innovation; Adaptation Policy and Finance; Tracking Climate and Clean Energy Finance and Corporate Governance.

· Two recent (Durban) flyers – one on climate finance and one on climate policy to promote technology innovation (prepared for Durban) – which highlight results from recent work, can be found here:
http://www.oecd.org/dataoecd/18/35/49096643.pdf (Climate Finance)
http://www.oecd.org/dataoecd/36/31/49076220.pdf (Promoting Technological Innovation to Address Climate Change)

.

· A draft report on what donors do to leverage infrastructure investment, focused on the case of Africa "Mapping Support for Infrastructure Investment" COM/DAF/INV/DCD/DAC(2011)4/REV1 - see latest version enclosed here in EGID zip file (along with agenda & other documents for the "Expert Group on Investment and Development" overseeing this work stream – NB: this is under our Investment Committee which is led at Secretariat level by Wes Scholz; email:
(b)(6) @oecd.org<(b)(6) @oecd.org>).

o In this, we look at 2 ways of "mobilizing" infrastructure investment (including for "green" infrastructure): (i) donor support to the enabling environment; (ii) innovative financing mechanisms to engage private investors. We have also provided examples at the end of this message of donor-backed infrastructure projects which could be considered as "green projects". (These are extracted from the report – see below.)

o This report was presented at the Global Forum on International Investment in December last year;

see related information here:
http://www.oecd.org/document/20/0,3746,en_2649_34893_44664980_1_1_1_1,00.html

o This report also draws on OECD development cooperation experience and ODA data (i.e. from the OECD Development Assistance Committee Creditor Reporting System – also known as the CRS); as discussed, these data are open access and may be of interest to your report. In particular, ODA that supports global environmental objectives is tracked through the use of "Rio Markers", see:
http://www.oecd.org/document/6/0,3746,en_2649_34447_43843462_1_1_1_1,00.html

· An overview of OECD water work which includes some focused work on infrastructure finance (new brochure here: http://www.oecd.org/dataoecd/3/5/49854843.pdf ; & also see website: www.oecd.org/daf/investment/water<http://www.oecd.org/daf/investment/water>

I will be back in touch about possible time to convene an ad-hoc govt/private sector group to advise on our policy framework & related work on financing green infrastructure. Although there is an OECD adaptation workshop 10-11 May, it may be that we can run a parallel exchange for a half day 11 May - at the OECD hq here in Paris.

Best,
Jan

Jan Corfee-Morlot, PhD
Climate Finance Team Lead/Senior Analyst
OECD Environment Directorate
Climate Change, Biodiversity and Development Division
2 rue André Pascal
75775 Paris CEDEX 16
FRANCE
(b)(6)
www.oecd.org/env/cc/financing<http://www.oecd.org/env/cc/financing>

(NR)

[redacted]

3. (NR)

[redacted]

[redacted]

From: (b)(6) @weforum.org
Sent: 13 February, 2012 9:50 AM
To: STEER Andrew D.; (b)(6) t@db.com; (b)(6) @gggi.org; (b)(6) @suntech-power.com; UPTON Simon, ENV; (b)(6) @suzlon.com; (b)(6) @kfw.de; (b)(6) @enel.com; (b)(6) @shell.com; (b)(6) @vestas.com; (b)(6) @gmail.com; (b)(6) i@eskom.co.za; (b)(6) @lse.ac.uk; (b)(6) @db.com; (b)(6) @enel.com; (b)(6) @enel.com; (b)(6) @power.alstom.com; (b)(6) t@barclayscapital.com; (b)(6) i@barclayscapital.com; (b)(6) @accenture.com; (b)(6) @barclayscapital.com; (b)(6) @gdfsuez.com; (b) @suuma.mx; (b)(6) @ine.gob.mx; (b)(6) @ine.gob.mx; (b)(6) @fundacionidea.org.mx; (b)(6) @fundacionidea.org.mx; CORFEE-MORLOT Jan, ENV/CBD; KAMINKER Christopher, ENV; (b)(6) @korealife.com; (b)(6) @korealife.com; (b)(6) @paran.com; (b)(6) @gdfsuez.com; (b)(6) @gdfsuez.com; (b)(6) @sre.gob.mx; (b) @sre.gob.mx; (b)(6) @fundacionidea.org.mx; (b)(6) @fundacionidea.org.mx
Cc: (b)(6) @weforum.org; (b)(6) @weforum.org; (b)(6) @weforum.org; (b)(6) y@weforum.org; (b)(6) @weforum.org; (b)(6) @weforum.org; (b)(6) @weforum.org; (b)(6) @weforum.org; (b)(6) l@weforum.org; (b)(6) @weforum.org; (b)(6) @weforum.org; (b)(6) @weforum.org; (b)(6) @weforum.org
Subject: G20 Green Growth Taskforce Sherpa call 9 Feb - Next steps

(NR)

[redacted]

NR [redacted]

In the meantime don't hesitate to contact us if you have any questions.

Best regards,
Tom Kerr

Green Finance, Investment in Infrastructure and Other Related Topics

Recent Work from the OECD

Submitted to B20 Task Team – submitted 20 February 2012

Table of Contents

1.1 Mobilising Finance and Investment for Green Infrastructure

Transitioning to a low-carbon, and climate resilient economy, and more broadly greening growth over the next 20 years will require significant investment and consequently private sources of capital on a much larger scale than previously. A recent paper to G20 Finance Ministers on "**Mobilising Climate Finance**", which the OECD co-authored, responds to a request to explore new sources of finance to support climate change adaptation and mitigation in developing countries.

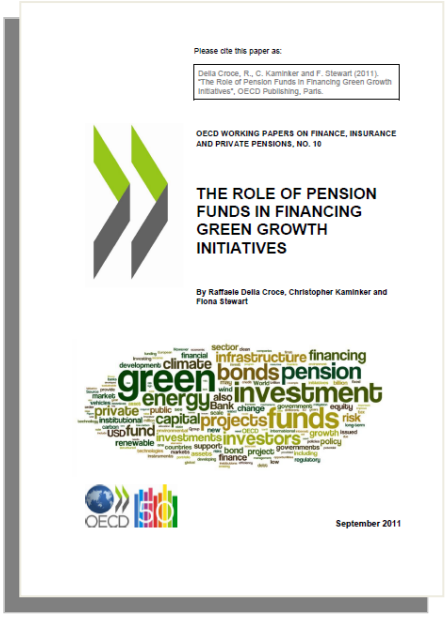
Towards a policy framework for green infrastructure investment

An ongoing OECD project examines the "**Towards a policy framework for green infrastructure investment: the case of low-carbon, climate resilient development**" (consultation draft available now, final expected at the end of 2012; see enclosed). Relevant policies range from those that establish good business and investment conditions – from opening markets and policies designed to stimulate competition and protect intellectual property – to policies designed to stimulate investment in clean energy (e.g. reforming fossil fuel subsidies, putting a price on carbon, energy efficiency regulations, etc). The paper advocates integrating clean energy, low-carbon and climate resilient policies into a broader investment policy framework, with special attention to the use of targeted financial instruments.

A recent working paper, "**Sources of Finance, Investment Policies and Plant Entry in the Renewable Energy Sector**" (2011), looks at an array of public policies promoting investment in the renewable energy sector. It examines how selected developed country governments have provided targeted support for renewable energy investment, which can be justified by the relative immaturity of these technologies. This immaturity makes it more difficult for lenders to accurately price relative risk of investments in "clean" energy, and thus for investors in the sector to obtain financing at reasonable cost. Moreover, in some cases there can be important learning and demonstration effects, which will not be realised in the absence of initial policy support since the returns on investment will be too low.

Institutional investors and innovative mechanisms to finance green growth

A recent OECD study on "**The Role of Pension Funds in Financing Green Growth Initiatives**" (2011) examines some of the initiatives that are currently under way to assist and encourage pension funds to help finance green growth projects. With their USD 28 trillion in assets, pension funds - along with other institutional investors - potentially have an important role to play in financing such green growth initiatives. However, at present only a very small fraction of potentially available capital has been allocated to green growth initiatives. Most pension funds are more interested in lower risk investments which provide a steady, inflation adjusted income stream - with green bonds consequently gaining interest as an asset class, particularly - though not only - with the SRI universe of institutional investors. The working paper suggests that governments may be able to increase levels of green investment by providing supportive environmental policy backdrops, creating



investment vehicles and fostering liquid markets, supporting investment in green infrastructure, removing investment barriers, providing education and guidance to investors, and improving pension fund governance. It also provides a **green bond market review** and options for scaling up these instruments.

A key step forward would be to foster liquid, transparent and sustainable market conditions and instruments to attract institutional investors to long-term, low-carbon and climate-resilient (LCCR) infrastructure investment. Beyond supporting work in all country contexts to set out the vision, advance LCCR infrastructure planning and establish stable domestic policy frameworks, the B20 could encourage private investment in green infrastructure by:

· Increasing use of public financing mechanisms such as loan guarantees and insurance to cover regulatory risks of investments;

· Facilitating project preparation and access to local finance at regional or domestic level through use of innovative institutional mechanisms, such as green banks, infrastructure agencies or investor platforms;

· Issuing green financing vehicles, such as green bonds or green funds, to be used in combination with internationally harmonized standard setting or 'rating agency' approaches to promote transparency and a common understanding of "green" investment;

· Encouraging governments to revisit funding regulations, to ensure that pension funds are not discouraged from investment in long-term projects, which green infrastructure will require.

Since the 2008 financial crisis, the current economic context has led to an increasingly short supply of long-term capital, which has profound implications for growth and financial stability. The OECD has launched a project to research, identify and promote policy options to encourage institutional investors to act in their long -term capacity and support infrastructure investment more generally. This "**Project on Long-Term Investment**" is looking in particular at institutional investors and at the general question: Why is long-term investment important? More specifically, some early findings that are relevant to the clean energy challenge include:

- Patient capital allows investors to access the higher returns that less-liquid, longer-term investments can generate, lowers turnover, encourages less pro-cyclical investment strategies and therefore leads to higher net investment rates of return and greater financial stability.
- Productive capital provides support for infrastructure development, green growth initiatives, SME finance etc., leading to sustainable growth while engaged capital also encourages active voting policies, leading to better corporate governance.

This is a two-year project with interim products and events: two events are planned for institutional investors in India and Indonesia for the second half of 2012, and an emerging markets pension funds draft paper might be available by spring 2012. Several other background documents were published in 2011: a "Survey of Pension Funds Investment in Infrastructure", and "Pension Funds Investment in

Infrastructure: Policy Actions."

Subsidy reform and carbon markets as a new source of finance

The OECD has contributed, along with other international organisations, to recent joint reports to support G-20 initiatives on fossil fuel subsidy reform, notably: "Fossil-fuel and other energy subsidies: An update of the G-20 Pittsburgh and Toronto Commitments" (2011); and "Analysis of the Scope of Energy Subsidies and Suggestions for the G-20 Initiative" (2010).

In part to support the G-20 efforts, in 2011 the OECD launched a first-ever *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*. In this report, the OECD has compiled an inventory of over 250 measures that support fossil-fuel production or use in 24 industrialised countries, which together account for 95% of energy supply in OECD countries. Those measures had an overall value of about USD 45-75 billion a year between 2005 and 2010. Because several OECD countries do not produce significant amounts of fossil fuels, consumer measures account for a large share of overall support. Producer support remains, however, far from negligible in those OECD countries that produce fossil fuels.

A significant portion of the support provided in OECD countries is through tax expenditures such as tax credits, exemptions or reduced rates. These provisions provide a preference for fossil fuels compared with the "normal" tax rules in the particular country. Since normal tax rules and rates vary so much between countries, however, this type of support is not readily comparable.

The OECD inventory marks a significant step towards greater transparency and accountability with respect to the policies that relate to the production or use of fossil fuels. While it does not evaluate the merits of individual policies, it is expected that the inventory will facilitate the analysis and understanding of which of these mechanisms may be inefficient or wasteful, and the identification of options for reform.

The carbon market is also relatively new source of finance for clean energy projects. A further deepening and extending of the carbon market also creates the scope for substantial transfers of private funds from developed to developing countries for clean energy projects. The OECD and the IEA work with governments to analyse and advise on the design, development and implementation of GHG market instruments such as cap-and-trade schemes.

A recent report from the Climate Change Expert Group (CCXG) – which is jointly supported by the OECD and the IEA -- explores technical aspects of carbon markets, including setting baselines and managing GHG units from multiple market mechanisms and were supported by the report "**Keeping Track: Options to Develop International Greenhouse Gas Accounting After 2012**" (2011). In 2012 work is forthcoming on baselines.

Joint OECD and IEA analysis also extends to governance of market approaches and project-based mechanisms. "**Market Readiness: Building Blocks for Market Approaches**" (2010) examines essential elements of what is required to establish market mechanisms in developing countries. A working paper entitled "**Cities and Carbon Market Finance: Taking Stock of Cities' Experience with Clean**

Development Mechanism (CDM) and Joint Implementation (JI)" (2010) analyses experience to date with urban projects in compliance carbon markets. Other recent papers exploring issues related to linking emissions trading systems and voluntary markets include: "**Towards Global Carbon Pricing: Direct and Indirect Linking of Carbon Markets**" (2010); "**Voluntary Carbon Markets: How Can They Serve Climate Policies?"** (2010); and "**Buying and Cancelling Allowances as an Alternative to Offsets for the Voluntary Market: A Preliminary Review of Issues and Options**" (2010).

Trade and the environment

Within the OECD Joint Working Party on Trade and the Environment (JWPTE), several studies have recently been published on trade and climate change. One paper explored trade in services related to climate-change mitigation and found that companies are drawing on services from across the spectrum, from data-processing services provided via the Internet to services involved in the design, construction and maintenance of renewable-energy facilities. Removing impediments to trade in this area is vital if the full potential of renewable energy is to be realized.

Another paper provides an overview of existing measures for non-product-related processes and production methods (PPMs) adopted in the context of climate-change-mitigation policies, especially those linked to the life-cycle greenhouse-gas (GHG) emissions of particular products. The ostensive purpose of these measures is to promote better environmental outcomes and to ensure that domestic climate-change policies and incentives do not inadvertently undermine other environmental objectives. Despite their similar objectives, the reviewed measures differ considerably in their approaches, levels of detail, choices of instruments and targeted environmental characteristics. These measures may have impacts on trade. However, as they are fairly new, such impacts are currently hard to discern. On-going work includes an examination of domestic incentive measures for renewable energy with possible trade implications and a study on the role of cross-border trade in electricity in the expansion of renewables-based electric power.

Key Links:

www.oecd.org/env/cc/financing (includes links to G20 paper and to recent OECD fossil fuel subsidy work)
www.oecd.org/finance/lti
www.oecd.org/iea-oecd-ffss

www.oecd.org/env/cc/carbonmarkets

www.oecd.org/trade

http://www.oecd-ilibrary.org/trade/oecd-trade-and-environment-working-papers_18166881

1.2 OECD Environmental Outlook to 2050

If no new policies are implemented and the world continues business-as-usual, pressures of the growing population and economic activities on the environment will continue to increase. Based on model projections, this edition of the Environmental Outlook paints a possible picture of what the environment might look like in 2050. It focuses on four areas which were identified by the previous edition of the Outlook as needing urgent attention: climate change, biodiversity, water, and health and environment.

This book will include StatLinks, URLs which link statistical tables and graphs to Excel spreadsheets on the internet. The OECD Environmental Outlook to 2050 was prepared by a joint team from the OECD Environment Directorate (ENV) and the PBL Netherlands Environmental Assessment Agency www.oecd.org/environment/outlookto2050

1.3 Green Growth in the Energy Sector

The OECD and IEA have jointly produced a green growth study to look at the implications for the energy sector in moving towards a greener model of growth. The study "***Green Growth Strategy for Energy: A Preliminary Report***" (OECD, 2011) examines how to improve environmental performance of energy generation and systems as a cornerstone for economic growth. Policies for green growth in the energy sector will differ across countries, according to local environmental and economic conditions, institutional settings and stages of development, yet a number of common policy recommendations can be found. Many energy systems are 'locked-in' to high carbon production and consumption patterns that can be difficult to break for reasons that go beyond simple economics. This report recommends a set of measures to tackle market failures and barriers that otherwise will lead to underinvestment in the energy sector and environmental degradation. It also examines political economy challenges, including distribution effects and stranded capital that will arise in any transition process.

Key Links:
www.oecd.org/greengrowthstrategy

www.iea.org

1.4 Country-tailored Policy Surveillance

The OECD performs country-tailored policy analysis and surveillance covering finance and clean energy in OECD and non-member countries through the OECD Economic Review series (focusing on the energy sector and fossil fuel support) and through the Investment Review series (with selected countries offering a chapter focusing on green investment).

As of 2012, OECD Economic Reviews that address reform of fossil fuel and other energy price support include: Japan, India, Indonesia, Mexico, South Africa. In parallel, Investment Reviews of Colombia and Ukraine featuring "green investment chapters" are nearing completion, and reviews of other countries are underway or planned for 2012 (e.g. for Tunisia, Jordan, Malaysia). The chapters include a review of targeted financial measures intended to stimulate investment in green infrastructure and situate the

green investment challenge in the broader investment policy context.

1.5 Clean Innovation

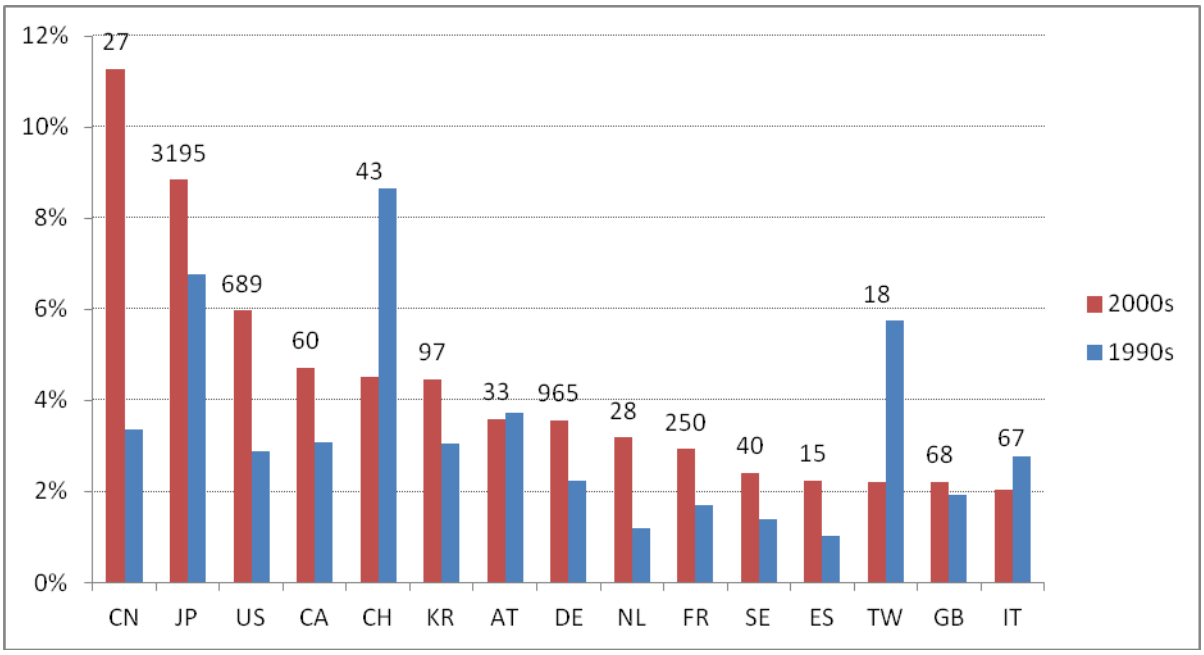
Innovation in Energy Technology

The OECD Innovation Strategy presented to Ministers in May 2010 focused on innovation for global challenges, including climate change, as part of its whole-of-government approach to innovation. This work is summarised in a synthesis report (***Towards Green Growth***), a toolkit (***Tools for delivering on green growth***), and a report on indicators (***Towards Green Growth: Measuring Progress – OECD Indicators***). A number of OECD governments and firms are now placing a strong emphasis on eco-innovation to address priority environmental issues, including climate change, while addressing concerns about the competitive impacts of environmental policies. In conjunction with the European Commission's *Environmental Technology Action Plan*, the OECD reviewed the policies and programmes that OECD countries have put in place to promote eco-innovation, including developing country profiles. This is complemented by case studies on selected climate-related innovations. This work is summarised in ***Better Policies to Support Eco-Innovation*** (2011). The publication notes the different routes followed by some OECD countries to support selected innovations (e.g. carbon capture and storage, combined heat and power generation, or electric cars). It investigates the conditions which determine the policy mix. It explores the interplay between policies to support eco-innovation and market structures. Further work is investigating opportunities for international co-operation in this area, to create larger markets and avoid unnecessary market fragmentation for climate-related innovations.

An on-going work programme undertaken in collaboration with the European Patent Office has involved the development of **indicators of innovation with respect to climate change mitigation** (e.g. renewable energy, energy efficiency and "clean" coal). This **data is now publicly available on OECD.*Stat***, and is being used widely. In particular, the data has been used to assess the effect of different policy measures on innovation in renewable energy and efficiency in electricity generation, as well as the factors which drive international research collaboration in climate mitigation technologies. Analysis of the role of different factors in encouraging the transfer of climate change mitigation technologies between countries is presented in the 2010 paper "**Climate Policy and Technological Innovation and Transfer: An Overview of Trends and Recent Empirical Results**." This work will be summarised in a forthcoming publication (*Energy and Climate Policy and Innovation*). Other work is focusing on innovation in alternative-fuelled vehicles. This work is summarised in ***Invention and Transfer of Environmental Technologies*** (2011). Work for 2012 will focus on research collaboration and technology transfer between Annex I and non-Annex I countries, and the development of innovation capacity in climate mitigation technologies.

The share of alternative fuel vehicle (AFV) technologies on overall motor vehicles patenting

(Numbers above bars indicate total claimed priorities for AFV technologies)



Source: OECD Invention and Transfer of Environmental Technologies.

Key Links:
www.oecd.org/environment/innovation
www.oecd.org/environment/innovation/globalforum
www.oecd.org/sti/ipr-statistics

Delivering Green Growth by Fostering Innovation

Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies.

Innovation is key to green growth. It helps decouple growth from natural capital depletion and contributes to economic growth and job creation. Business is the driver of innovation, but governments need to provide clear and stable market signals, for example through carbon pricing.

The new publication ***Fostering Innovation for Green Growth*** draws on work from across several parts of the OECD and explores policy actions for the deployment of new technologies and innovations as they emerge: investment in research and development, support for commercialisation, strengthening markets and fostering technology

diffusion. Competition will be essential to bring out the best solutions.

Key Link:
www.oecd.org/innovation

1.6 Adaptation to Climate Change

Efforts to reduce GHG emissions need to move hand-in-hand with policies and incentives to adapt to the impacts of climate change. How much adaptation might cost, and how large its benefits might be, are issues that are increasingly relevant both for on-the-ground projects and in international contexts. On-going OECD work on adaptation focuses on three main streams of work: (i) economic aspects of adaptation; (ii) integrating adaptation in development co-operation; and (iii) adaptation in domestic OECD contexts. These areas of work have contributed to the discussion of policy options for addressing climate change in the *OECD Environmental Outlook to 2050*. Two of these are outlined here as they relate to finance and investment.

Economic and Policy Aspects of Adaptation

This work examines the potential for economic and policy instruments to incentivise and motivate adaptation actions. Outputs of this work include the book ***Economic Aspects of Adaptation to Climate Change - Costs, Benefits and Policy Instruments*** (2008). It provides a critical assessment of adaptation costs and benefits in key climate sensitive sectors, as well as at national and global levels. The report calls for a raft of policy instruments to establish the right incentives to influence such decisions. Further work examines adaptation costs/benefits and interactions between adaptation and mitigation using Integrated Assessment Models (IAMs). The working paper **"Assessing the Role of Microfinance in Fostering Adaptation to Climate Change"** (2010) focuses on the role of microfinance in fostering adaptation to climate change, while the working paper **"Private Sector Engagement in Adaptation to Climate Change: Approaches to Managing Climate Risks"** (2011) considers what businesses are doing to manage their climate vulnerabilities and what factors can affect their adaptation decisions.

Key Links:

www.oecd.org/env/cc/adaptation

www.oecd.org/env/cc/ecoadaptation

www.oecd.org/env/cc/adaptation

www.oecd.org/env/cc/ccxg

Integrating Adaptation in Development Co-operation

In 2006, Development and Environment Ministers from OECD Countries endorsed a Declaration on Integrating Climate Change Adaptation into Development Co-operation, in which they called for "meaningful co-ordination and sharing of good practices on integrating climate change adaptation in development co-operation".

Follow-up work to this Ministerial Declaration includes a report entitled "Stocktaking of Progress on Integrating Adaptation to Climate Change into Development Co-operation Activities" (2007) and *Policy Guidance on Integrating Adaptation into Development Co-operation* (2009). Recent work on "Harmonising Climate Risk Management: Adaptation Screening and Assessment Tools for Development Co-operation" (2011) has considered how well current tools for screening climate risks and integrating adaptation into development planning meet users' needs. Another publication, "Monitoring and Evaluation for Adaptation: Lessons from Development Co-operation Agencies" (2011), considers the particular characteristics of monitoring and evaluation in the context of adaptation and lessons learned from development co-operation agencies on the choice and use of indicators, baseline and targets. The OECD is also producing policy guidance (forthcoming 2012) on enhancing capacity for greening development. The guidance is intended to help developing countries improve their environmental management and address challenges including climate change.

Key Links:

www.oecd.org/env/cc/adaptation/guidance

www.oecd.org/dac/environment/climatechange

1.7 Tracking Climate and Clean Energy Finance

The OECD/IEA's Climate Change Expert Group is working on how to improve the tracking of climate and clean energy finance. Its 2011 report "**Monitoring and Tracking Long-Term Finance to Support Climate Action**" highlights the relevant information that needs to be tracked in order to build a comprehensive MRV system for climate or clean energy finance, proposing both improvements to current reporting and tracking systems as well as new reporting approaches for a more robust and inclusive MRV system. This builds on a 2009 report "**Financing Climate Change Mitigation: Towards a Framework for Monitoring, Reporting and Verification**" that traces aggregate financial flows and proposes an approach for a strengthened system for MRV.

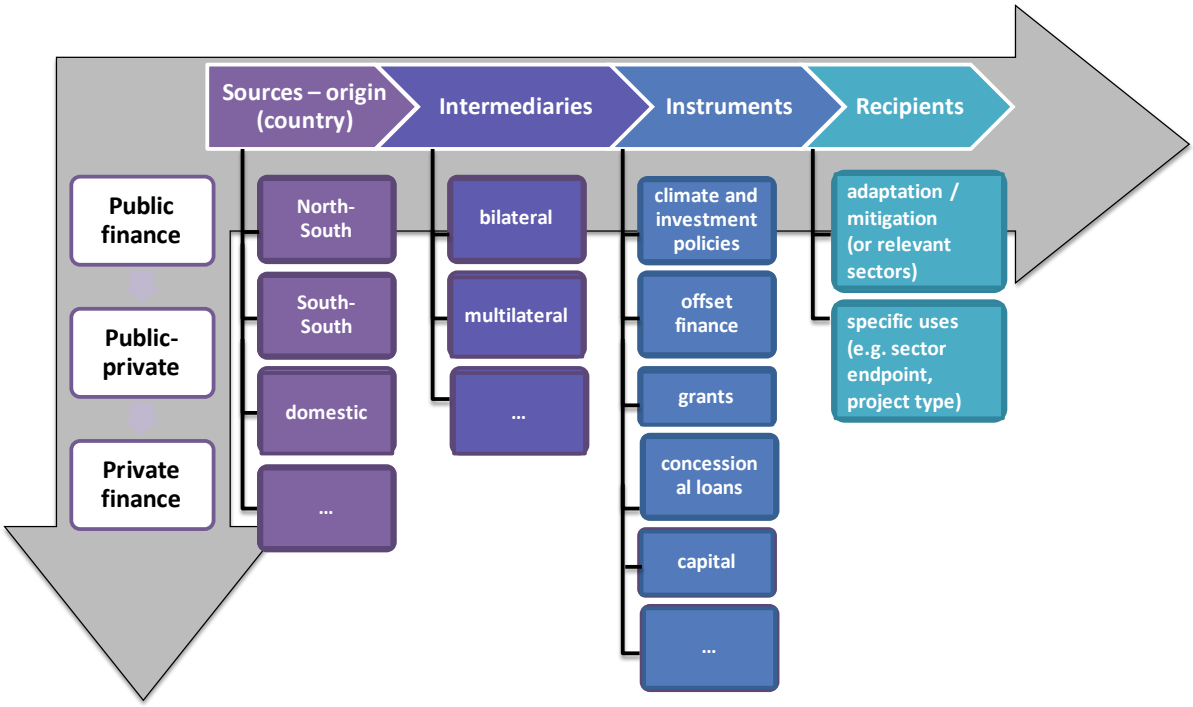
The OECD has been collecting statistics on ODA flows for climate change mitigation for over a decade. The **OECD/DAC Creditor Reporting System** tracks aid flows targeted at climate change mitigation and climate change adaptation, including to the energy sector. Data are publicly available from the DAC's online databases. Updated mitigation data and the first-ever data on adaptation, relating to 2010 flows, will become available at the end of 2011. Summaries are published in the form of factsheets. As for measuring flows other than ODA, DAC members agreed in 2011 to extend the application of the Rio markers for mitigation and adaptation to non-concessional developmental loans. The DAC is now also working on improving statistics on other categories of flows such as export credits, private flows, public

interventions that leverage private finance and on possibly identifying their relevance to climate change.

Building on work from UNCTAD, in 2010, the Working Party of the OECD Investment Committee initiated work on defining and measuring green FDI. It led to the development of an exploratory study "**Defining and Measuring Green FDI**" (2011) summarising existing work by OECD and others, investigating the practicability of various possible definitions of green FDI, and identifying associated investment policy restrictions. Further work is under way within the Working Group on International Investment Statistics of the Investment Committee on a meaningful operational definition of green FDI as well as related indicators to measure progress over time.

Key Links:
www.oecd.org/env/cc/financing
www.oecd.org/env/cc/ccxg
www.oecd.org/dac/stats/rioconventions
www.oecd.org/daf/investment/green

Dimensions of Climate Finance – Where the Largest Share Flows to Clean Energy



Source: Buchner, Brown and Corfee-Morlot (2011).

1.8 Corporate Governance

Transition to a ***Low-Carbon Economy: Public Goals and Corporate Practices*** **(2010)** explores business practices in disclosing climate change information, reducing greenhouse gas emissions and engaging suppliers and consumers in building a low-carbon economy. The book summarises policy frameworks, regulations and other drivers of corporate action and documents how companies are responding to, and

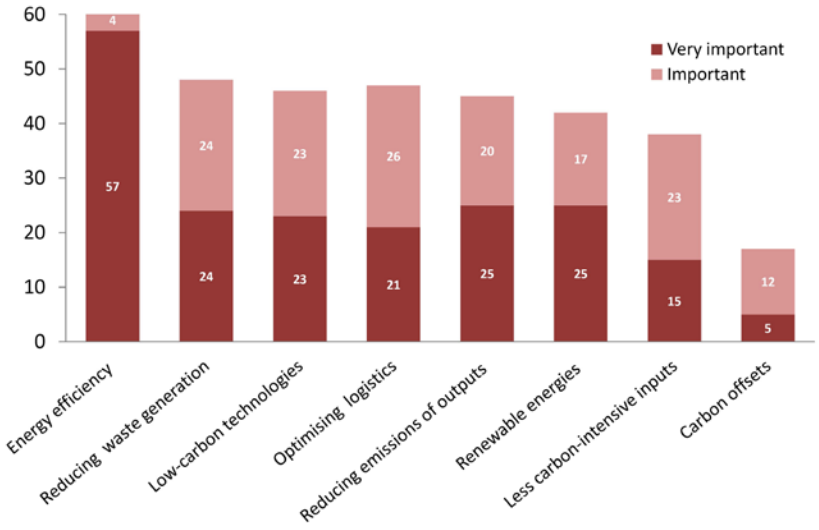
anticipating, growing expectations in these three areas, building on principles of responsible business conduct as identified in the ***OECD Guidelines for Multinational Enterprises*** **(2011)**.

Following the assessment that the wide range of existing GHG reporting frameworks is leading to higher costs and limited comparability of data, the OECD is now working with the United Nations Conference on Trade and Development (UNCTAD), the Global Reporting Initiative (GRI) and the Climate Disclosure Standards Board (CDSB) on a joint project to promote greater consistency among these frameworks. First results will be presented at the 'Rio +20' United Nations Conference on Sustainable Development in 2012.

Key Links:
www.oecd.org/daf/investment/cc
www.oecd.org/daf/investment/green

Actions Taken by Companies to Reduce Emissions

Number of companies (sample size = 63)



Source: OECD Survey on Business Practices to Reduce GHG Emissions, 2010.

Recent and Forthcoming Publications

Books

OECD (2012), *Energy and Climate Change Policy and Innovation*, OECD, Paris, forthcoming.

OECD (2012), *OECD Environmental Outlook to 2050*, OECD, Paris, forthcoming.

OECD (2012), *Policy Framework for Green Infrastructure Investment: the Case of Low-Carbon, Climate Resilient Development*, Paris, forthcoming.

OECD (2011), *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*, OECD,

Paris.

OECD (2011), *OECD Guidelines for Multinational Enterprises,* OECD, Paris.

OECD (2011), *Fostering Innovation for Green Growth*, OECD Green Growth Studies, OECD, Paris.

OECD (2011), *Smart Rules for Fair Trade: 50 Years of Export Credits*, OECD, Paris.

OECD (2010), *Cities and Climate Change,* OECD, Paris.

OECD (2010), *Eco-Innovation in Industry: Enabling Green Growth*, OECD, Paris.

OECD (2010), *Innovation and the Development Agenda*, OECD, Paris.

OECD (2010), *Measuring Innovation: A New Perspective*, OECD, Paris.

OECD (2010), *OECD Reviews of Risk Management Policies – Étude de l'OCDE sur la Gestion des Risques d'Inondation: Bassin de la Loire, France 2010*, OECD, Paris.

OECD (2010), *OECD Reviews of Risk Management Policies – Italy 2010: Review of the Italian National Civil Protection System*, OECD, Paris.

OECD (2010)*, Taxation, Innovation and the Environment*, OECD, Paris.

OECD (2010), *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*, OECD, Paris.

OECD (2010), *Transition to a Low-Carbon Economy: Public Goals and Corporate Practices,* OECD, Paris.

OECD (2009), *Policy Guidance on Integrating Climate Change Adaptation into Development Co-operation,* OECD, Paris.

OECD (2009), *The Economics of Climate Change Mitigation: Policies and Options for Global Action Beyond 2012,* OECD, Paris.

Papers, Reports and Other Documents

Buchner, B., J. Brown and J. Corfee-Morlot (2011), "Monitoring and Tracking Long-Term Finance to Support Climate Action", OECD and IEA, Paris.

Clapp, C., A. Leseur , O. Sartor, G. Briner, and J. Corfee-Morlot (2010), "Cities and Carbon Market Finance: Taking Stock of Cities' Experience with CDM and JI", *OECD and CDC Climat Recherche joint working paper*, OECD, Paris.

Corfee-Morlot, J., B. Guay and K. M. Larsen (2009), "Financing Climate Change Mitigation: Towards a Framework for Measurement, Reporting and Verification", OECD and IEA, Paris.

Della Croce, R. (2011), "Pension Funds Investment in Infrastructure: Policy Actions", *OECD Working Papers on Finance, Insurance and Private Pensions*, No. 13, OECD Publishing, Paris.

Della Croce, R., C. Kaminker, F. Stewart (2011), "The Role of Pension Funds in Financing Green Growth Initiatives", *OECD Working Papers on Finance, Insurance and Private Pensions No. 10,* OECD, Paris.

Doornbosch R., D. Gielen and P. Koutstaal (2008), "Mobilising Investments in Low-Emission Energy Technologies on the Scale Needed to Reduce the Risks of Climate Change"*, OECD Round Table on Sustainable Development Background Paper*, 27-28 April 2008, OECD, Paris.

Doornbosch R. and E. Knight (2008), "What Role for Public Finance in International Climate Change

Mitigation?", *OECD Round Table on Sustainable Development Discussion Paper*, OECD, Paris.

Haščič, Ivan, N. Johnstone, F. Watson and C. Kaminker (2010), "Climate Policy and Technological Innovation and Transfer: An Overview of Trends and Recent Empirical Results", OECD Environment Working Papers, No. 30, OECD.

IEA, OPEC, OECD and World Bank (2010), "Analysis of the Scope of Energy Subsidies and Suggestions for the G-20 Initiative", *Joint report prepared for submission to the G-20 Summit Meeting*, Toronto, 26-27 June 2010, IEA, OPEC, OECD and World Bank.

IEA, OPEC, OECD and World Bank (2011), "Fossil-fuel and other energy subsidies: An update of the G-20 Pittsburgh and Toronto Commitments", *Joint report prepared for submission to the G-20 Summit Meeting*, Cannes (France), 3-4 November 2011 , a joint IEA, OPEC, OECD, World Bank report to be released in November 2011, IEA, OPEC, OECD and World Bank.

Kalamova, M., C. Kaminker and N. Johnstone (2011), "Sources of Finance, Investment Policies and Plant Entry in the Renewable Energy Sector", *OECD Environment Working Papers No. 37,* OECD, Paris.

OECD (2012), *Enabling Local Green Growth: Facing Climate Change effects on Employment and Local Development*, OECD, Paris, forthcoming.

OECD (2012), *Green Growth Strategy for Energy: A Preliminary Report*", OECD, Paris, forthcoming.

OECD (2011), "ICT applications for the smart grid. Opportunities and policy implications", OECD, Paris, forthcoming.

OECD (2011), "Development Perspectives for a post-2012 Climate Financing Architecture", OECD, Paris.

OECD (2011), Survey of Pension Funds Investment in Infrastructure, OECD, Paris.

OECD (2011), "Tracking Aid in Support of Climate Change Mitigation and Adaptation in Developing Countries", *OECD Factsheet*, OECD, Paris.

OECD (2009), "Climate Change and Development: Key Principles to Inform Climate Change Financing", *OECD Factsheet*, OECD, Paris.

OECD (2009), "Cost-Effective Actions to Tackle Climate Change", *Policy Brief*, OECD, Paris.

OECD (2009), "Measuring Aid Targeting the Objectives of the United Nations Framework Convention on Climate Change", *Policy Brief*, OECD, Paris.

Weber, V. (2009), "Smart Sensor Networks: Technologies and Applications for Green Growth", OECD, Paris.

World Bank, in close partnership with IMF, OECD and the Regional Development Banks (2011), "Mobilizing Climate Finance", Paper prepared at the request of G-20 Finance Ministers, World Bank, IMF, OECD and the Regional Development Banks.

Table 1**. Elements of an Integrated Domestic Policy Framework for Green Infrastructure Investment**

Investment Policy Framework	1. **Strategic goal setting for a LCCR green economy** *Clear, long-term vision and targets for infrastructure and climate change; policy alignment and multilevel governance, including stakeholder engagement* 2. **Enabling policies for competitive, open markets and greening infrastructure investment** *Sound investment policies; market based and regulatory policies to "put a price on carbon" and correct for environmental externalities; remove barriers and disincentives, incentivise LCCR innovation and investment* 3. **Financial policies and instruments to attract private sector participation** *Financial reforms to support long-term investment and insurance markets; innovative financial mechanisms for risk-sharing such as green bonds; transitional direct support for LCCR investment* 4. **Mobilising public and private resources** *R&D, human and institutional capacity building to support LCCR innovation, monitoring and enforcement, climate risk and vulnerability assessment capacity* 5. **Promoting green business conduct and consumer engagement** *Corporate and consumer awareness programmes, corporate reporting, information policies, outreach*	**Climate Change Policy Framework**

Source: OECD, 2012 forthcoming, *Towards a Policy Framework for Low-Carbon, Climate-Resilient Infrastructure Investment.*

Table 2. **The double challenge of low-carbon, climate-resilient infrastructure projects: risk analysis**

		Traditional risks linked to infrastructure projects	Additional risks linked to the climate change aspects of infrastructure projects
Political, policy and regulatory risks	*Policy risk*	Lack of political commitment / policy certainty over the long term on infrastructure planning	Lack of long term low carbon development strategies Trade barriers (tariff and non-tariff barriers) on green technologies and/or their inputs, Lack of harmonized environmental regulations. Lack of political commitment / policy certainty over the stability of specific forms of support to green investment, such as feed- in tariffs.
	Regulatory risk	Tariffs regulations to increase fees with inflation fall behind schedule; High bidding costs involved in the procurement process of infrastructure projects (administrative cost); Fragmentation of the market among different levels of government	Instability on the price of carbon, such as weak or unstable environmental regulations. Existence of fossil fuels subsidies that make other investments more attractive to investors
	Legal and ownership rights	Unknown future litigation, planning consents not granted, lease running out	
	Political and social risk	Opposition from pressure groups; corruption	Additional forms of protest to specific LCCR such as Carbon Capture and Storage or wind farms
	Currency risk	Long term investment horizon for infrastructure	Long term investment horizon for climate threat and mitigation
Commercial, and technical risks	*Technological risk*	Includes the risk of technology failure or under-performance relative to expectations	Particularly high in the context of low carbon investments as they involve new technologies. The level of risk will depend on the maturity of the technology and the track record of the technology provider.
	Construction risk	Covering delays in the completion of the project, the interface between the different contracts of subcontractors or stakeholders	Lack of expertise in new climate mitigation and adaptation technologies
	Operational risk	Once the project has been constructed linked to the ability of the management to operate the asset, and to the decommissioning of the project.	Lack of expertise and track records in new climate mitigation and adaptation technologies
	Environmental risk	Unforeseen environmental hazards linked to an infrastructure project Climate risk, changing climate can damage the well functioning of infrastructure.	Risk related to the uncertainty of climate change in infrastructure for adaptation in particular
Market risks	*Business risk*	More competitors entering; Change in consumer preferences and demand	Technological advances, Lack of familiarity with new low carbon technologies
	Reputation risk	Damage to a firm's reputation can result in lost revenue or destruction of shareholder value. Such damage may stem from local sensitivities and needs.	The climate context could mitigate the reputational risk though some new technologies, such as wind, tide or CCS projects could face local stakeholder resistance.

Source: OECD, 2012 forthcoming, *Towards a Policy Framework for Low-Carbon, Climate-Resilient Infrastructure Investment.*

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