

EXERCISING LEADERSHIP ON CLIMATE CHANGE: CHOICES FOR THE NEXT PRESIDENT

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Over the past year, members and friends in the Stanford University community have been examining potential strategies for the next President to address the many challenges associated with combating climate change. Supported by the Hewlett Foundation, the Climate Implementation Project has explored substantive policy ideas for addressing climate change at the federal level. In addition, it has solicited recommendations on how the next Administration might address related organizational and governance questions – a particularly challenging subject for climate change, which cuts horizontally across many affected federal agencies and vertically through all levels of government.

The Stanford project gathered ideas through two workshops held at Stanford and in Washington, a major conference on the Stanford campus on May 6, 2016, and the presentation of papers at the National Press Club in Washington, D.C. on September 15, 2016.

The result is a rich [compilation](#) of serious recommendations for the next President that is available on line. The exercise has produced a pre-conference paper on Optimizing White House and Cabinet Agencies' Roles in Implementing Federal Climate Change Initiatives, summaries of take-aways from the two workshops and the May 6th conference, a dozen individual papers presented at the National Press Club, and videos of presentations made at the May and September events.

Throughout this exercise, we encouraged participants to move beyond conventional thinking and offer creative suggestions for how the next President might build out his or her climate agenda. As a result, the body of work produced through the Climate Implementation Project emphasizes thoughtful and even bold thinking, rather than laundry lists of recommendations.

To help interested observers dive in and appreciate the significance of the content produced through the Stanford project, we have identified 10 major ideas and take-aways that offer a window into the project's content. We hope that this quick review peaks your interest, and prompts you to dig deeper into the materials produced during the effort.

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1. Climate Change Is Accelerating; It Must Be a Priority for the Next President

Chris Field presented a paper with Katharine Mach that reviews “Eight Ways the World Has Changed Since the Last IPCC Report.” It should be required reading for all serious policymakers.

The Fields/Mach paper reviews how recent climate data and policy developments square with analyses included in the last comprehensive Intergovernmental Panel Climate Change report, which was issued in 2013 and 2014. The paper includes a number of important observations about recent scientific data and analyses. It points to studies and data that: debunk the notion that there has been a warming pause or slowdown; confirm that recent warming has been rapid; note that climate change has made extremes substantially more likely; project a higher maximum sea-level rise during the 21st century; and indicate that global economies may be more sensitive to warming than previously estimated. It is a sobering update on the science.

The paper is not all bad news. It also notes that in both 2014 and 2015, global carbon emissions barely grew or even decreased, despite modest economic growth, demonstrating initial stages of disconnecting emissions and economic activity. And it credits the Paris Agreement for memorializing ambitious climate goals and for putting in place a workable process for moving the global community forward.

2. Competition and Innovation Should Be Unleashed in the Electricity Sector

Several participants in the Stanford project lamented structural barriers in the electricity sector that inhibit competition and innovation. There was broad agreement that transmission services are appropriately treated as a regulated monopoly, but Reed Hundt, Andy Karsner and others expressed concern that some utilities and the Public Utility Commissions that oversee them are improperly extending monopoly power to stifle competition in power generation (by working against distributed generation companies, for example) and in demand-side, “behind the meter” innovations. Even Michael Picker, Chair of the California Public Utility Commission, forthrightly stated that the utility model is outmoded and needs to be adjusted, now that competition has emerged in the industry.

Consistent with this theme, several speakers urged the next President to be more assertive in advocating a national policy that calls on state regulatory authorities to actively promote more competition in generating electricity, and in allowing behind the meter innovations. Michael Wara, for example, recommended that the next Administration clarify the grid functions that are subject to regulated monopolies. He argued that the White House, Energy Secretary and Attorney General should use antitrust authority to review mergers, challenge anti-competitive behavior in the energy generation field, and spur action by State Utility Commissions to address competition issues in their decisions.

Michael Gergen argued that DOE could take a more activist role under existing Department of Energy authorities in pushing FERC and state PUCs to take steps to deploy clean energy resources that enhance the reliability of the bulk power grid where current or expected future reliability is determined to be inadequate (e.g., energy storage, microgrids); by commencing investigations and hearings to develop model standards for the elimination of barriers to the deployment of clean energy resources; and by identifying regional districts for the voluntary interconnection and coordination of facilities for the wholesale generation, transmission and sale clean electric energy.

Several speakers acknowledged the need to address legitimate cost and rate-related issues associated with new entrants in electricity markets, and the importance of adequately and fairly funding a vibrant grid – and, indeed, an upgraded, smarter grid. On this point, Nancy Pfund urged the new team at the White House, DOE and FERC to work collaboratively with PUCs, utilities, and distributed energy companies and move beyond net metering debates and identify a distributed energy cost-benefit framework that sets clear rules and competitive opportunities for new, renewable energy entrants.

Reed Hundt identified additional policy prescriptions to increase competition and innovation in the electricity sector, including potential incentive-based mechanisms to encourage states to emulate the New York State’s innovative, competition-engendering Reform the Energy Visions (“REV”) plan. More generally, Hundt drew compelling parallels between energy and telecommunications, noting that the onset of competition in the telecommunications industry utterly transformed an anti-competitive monopoly to a super-competitive, multi-player innovation hub that has opened up new markets and delivered stunning innovations. He noted that creative financing tools, including state-based green banks, will be needed to help innovative, insurgent competitors use the utilities’ distribution platforms.

3. R&D, Deployment and Financing

In the May 6th event, Arun Majumdar emphasized the need to scale up new technologies, which can only occur with the active involvement of the private sector. He expanded on a paper that he wrote with John Deutch that argued for a Sematech-type collaboration in which companies invest jointly with national laboratories and academic research institutions in research, development and deployment activities, with an eye toward deploying new, clean energy technologies at commercially meaningful scales. Majumdar pointed out that if companies put “skin in the game” and work collaboratively with national labs and others, innovations are more likely to find scalable market opportunities.

Jennifer Granholm struck a related theme, emphasizing the importance of incentivizing states and local industries and universities to create a productive ecosystem for developing clean energy and the jobs that go with it. Granholm recommended adoption of a Clean Energy Challenge that would competitively award federal funds to states that are

committing to exceed minimum clean energy requirements by taking additional steps that might include, for example, investing in workforce development strategies; providing technology transfer and incubation opportunities; reforming permitting systems; and providing access to low-cost capital as, for example, through State-sponsored green banks.

Nancy Pfund provided a business and finance perspective. She offered a number of both practical and creative suggestions, including: how existing renewable energy tax incentive programs should be tweaked to broaden their applicability and effectiveness and how renewable energy opportunities could be extended to lower-income, disadvantaged communities. Pfund also noted that focusing on a relatively small number of high population, low penetration states could yield dramatic increases in renewable energy production. And on the legislative side, Pfund offered a variety of new program ideas to facilitate the transition toward solar energy, including the creative leveraging of overdue public housing upgrades with energy efficiency investments, and linkages between the shuttering of coal plants and investments in clean energy and worker training in affected communities.

Dan Reicher chimed in with an emphasis on expanding REIT eligibility to solar and other renewables, extending the reach of Master Limited Partnerships to clean energy technologies, bringing back tax-advantaged Private Activity Bonding authority for utilities willing to invest in carbon capture and storage, and other options. Jagdeep Bachher joined with Reicher in emphasizing the importance of drawing institutional investors into clean energy investments through creative mechanisms such as the Aligned Intermediary project, which offers sophisticated investment advice for more patient, long-term institutional investors.

Bachher, who is facilitating the University of California's participation in Bill Gates' \$20 billion dollar Breakthrough Initiative, also acknowledged the pressures being put on institutional investors to support clean energy. He believes that with increased oversight and attention by the SEC, green bond funds could become a larger and more credible financing option for clean energy projects.

4. Infrastructure Investment Presents a Climate Opportunity

Several speakers noted that the next President has an important opportunity to address climate when pursuing needed investments in new infrastructure. Workshop participants including John Porcari and Dan Tangherlini emphasized, for example, that smart infrastructure investments can have substantial indirect climate benefits by debottlenecking freight movement on roads, rails and ports, providing mass transit and other efficient transportation options, reducing the energy intensity of water treatment and conveyance infrastructure, and the like.

Kate Gordon offered an additional dimension on the infrastructure/climate connection. Her paper suggested that public spending on infrastructure projects should follow private sector practices and be subjected to a climate risk measurement and management screen.

Potential physical risks associated with sea rise and storm surge, for example, should be addressed as a condition of receiving public funds. Associated climate impacts also should be considered, including the carbon intensity of infrastructure projects. Rather than relying on energy-intensive steel and concrete building materials, for example, builders should be incentivized to build low carbon infrastructure using materials such as solidified, sequestered carbon or recycled steel.

5. Using a Broader Calculus to Make Smart Energy Choices

Rob Jackson warned that policymakers should not be uni-dimensional when comparing the relative environmental merits of different energy choices. Instead, they should be guided by multiple environmental and public health considerations. He argued, for example, that while coal should be disfavored as an energy source due to its carbon intensity, coal also scores poorly on other environmental metrics. Its emissions cause serious, direct health effects and coal processing and combustion use large amounts of water and produce coal ash, which poses risks to waterways and communities.

The combustion of natural gas, in contrast, generates significantly less pollution, including less carbon dioxide, particulate matter, and the like. However, methane leakage can overwhelm natural gas' carbon advantage over coal. Jackson emphasized that natural gas may have little or no significant climate advantage over coal unless methane leakage is reduced, particularly from wet gas operations and from older distributions systems.

Steve Chu emphasized the importance that viable carbon capture and storage technologies be developed because many industries will continue to be reliance on fossil fuels for the indefinite future. Also, growing economics such India, China are likely to continue to be dependent on fossil fuels for many years.

6. Prioritizing Health

Dr. Michele Barry and colleagues at Stanford Medical School's Center for Innovation in Global Health argued persuasively in their paper that climate change is emerging as "the ultimate global health crisis." They note that climate change already is responsible for many deaths due to extreme weather events. In addition, it functions as a risk multiplier, posing particular health dangers to the most vulnerable – children, the elderly, the poor, and the sick – due to shifting patterns of disease, food insecurity, water scarcity, excessive heat and related stresses.

Dr. Barry's paper makes a several key recommendations for the next President. The lead proposal is that the President launch a new program patterned on PEPFAR, President Bush's AIDS-focused global health initiative that saved millions of lives in Africa. The new climate change health initiative, tagged as the "President's Emergency Response to Climate Change" or "PERCC" would establish a comprehensive approach to address climate change health issues, including setting up a strong global surveillance system, developing new early-warning tools, linking

existing networks, making data widely available, and creating platforms to share results. The PERCC initiative also would invest in international research, development and demonstration to advance adaptations to climate change and deepen knowledge on the co-benefits of integrating climate science and health science. Efforts would be devoted to strengthening preparedness and resilience in all health systems, particularly in low- and middle-income countries and in geographies already heavily affected by climate change.

7. Integrating Land Use Issues into the Climate Agenda

David Hayes emphasized that the next President needs to elevate the role of land use in the climate agenda. New data indicate that with modest investments in good stewardship, nature's assets have the potential to take up and store significantly more carbon dioxide in the world's forests, rangelands, and soils. A forthcoming study by the Natural Conservancy has quantified this potential. It concludes that even when taking cost constraints into account, 20 natural pathways involving conservation, restoration, and better land management across global forests, wetlands, grasslands and agricultural lands have the potential to provide more than 40% of the mitigation needed to hold warming below 2 degrees Celsius by 2030. This is 30% higher than previous estimates. There is a double bottom line benefit to investing in our natural and working landscapes: attending to the health of our landscapes will produce important co-benefits, including clean water, biodiversity, and increased agricultural production.

Land use also demands priority attention because 25 percent of the world's annual greenhouse gas emissions are directly caused by poor land use practices, including the on-going destruction of forests. Some progress has been made in reducing the rate of deforestation, but smart forest protection strategies – including cross-border forestry investments, as discussed below – can generate significant, additional emissions reductions.

In addition, the pivot to a clean energy economy depends on governments making sound, timely land use decisions to site and build new clean energy generation and transmission infrastructure. Land use issues also are front and center when it comes to climate impacts. Sea rise and storm surge already are impacting coastal infrastructure and resources. Increased droughts, floods, wildfires and other climate change-related impacts on our landscapes are challenging cities and rural areas alike. Thoughtful land stewardship can blunt some of these impacts and make our lands and waters more resilient in the face of climate change.

Specific actions that the next President can take to actuate a land use/climate agenda include providing decision makers at all levels of government and civil society with easily accessible tools to measure and share information about climate benefits and risks associated with local land types. Also, a high-level office should address land use adaptation and resilience issues by providing accessible mapping information that provides detailed, science-based information about existing and projected regional climate impacts on land and water resources, and a web-based clearinghouse that shares

information about local, regional and national adaptation and resilience investments and strategies.

8. Engaging in International Climate Change Efforts

Several speakers noted the importance of continued leadership by the United States on the international climate change stage. Arun Majumdar noted that there are roughly 1.5 to 3 billion people in the world who do not have access to modern electricity and, as a result, are economically stranded in the 19th century without access to clean water, modern agriculture, education, information and industrial productivity. The United States and other developed nations have an obligation to help address this global energy poverty, and to do so by leapfrogging over fossil fuel-based energy to sustainable, clean energy sources. Global progress in fighting climate change depends on it. The opening of this vast new market for clean energy also provides significant business opportunities for American businesses.

Bill Reilly emphasized that the U.S. must help the developing world finance its ambitious commitments to reduce emissions and move to a clean energy economy. In addition to securing U.S. funds, Reilly recommends that the President reverse U.S. policy, which currently disfavors China's Asian Infrastructure Bank, and instead embrace the AIB and encourage China to make achievement of the Paris commitments a major thrust of the Bank's investments. He argues that the partnership of the United States and China, together with an important well-capitalized new international funding institution, could help ensure that China remains engaged in reducing its own and other countries' greenhouse gases, marshal significant funds, and set an example to other fast-growing developing countries.

David Hayes emphasized that the next President should facilitate cross-border market opportunities for U.S. companies to invest in deforestation-related emissions reductions. Carbon stocks in forests can now be quantified with objective measurement tools that provide a high degree of confidence. The time is ripe to establish investment vehicles that facilitate the protection of at-risk forests around the world.

Several speakers, including Arun Majumdar and Bill Reilly, also emphasized the importance of fostering North American climate collaboration among the U.S., Canada and Mexico, and using the Montreal Protocol model to reduce HFC emissions.

9. Regulations + Carbon Tax

Because the Stanford climate project has been focused on next steps, most speakers assumed that the Clean Power Plan would – and should – be implemented under the Clean Air Act. Similarly, several speakers noted the importance of regulating methane leakage and HFCs.

Over the course of the project, however, two broader, common themes emerged on the subject of regulations.

First, several speakers spoke in favor of pushing Congress to enact a carbon tax. Secretary George Shultz, for example, spoke forcefully in favor of a revenue-neutral carbon tax as a way to ensure that coal and other fossil fuels' true costs are reflected in the market. Others expressed support for the concept of a carbon tax, but viewed it as an unlikely political exercise, at least in the near term.

Second, several speakers, including Jim Connaughton and Andy Karsner, urged that market tools be favored over mandates, and that the next President seek to overhaul the patchwork of subsidies and one-off regulatory requirements associated with various energy sources. Connaughton pushed to simplify clean power and transportation mandates. Karsner recommended creating clean energy competitive opportunities for the business sector via a "transition by design" approach, rather than relying on a regulatory agenda that is inherently reactive in nature and likely to fail in important respects. Along the way, Karsner, Majumdar and Hundt, among others, noted that a new social compact should undergird the climate agenda, with a recognition that affordable energy must remain available to all segments of society, and that opportunities for increased clean energy choices likewise must be available to all.

Finally, several speakers, including Dan Reicher, emphasized the importance of expanding energy efficiency initiatives. Secretary Shultz also pushed this theme, recommending that conference attendees read "Energy Efficiency: Building a Clean Secure Economy" – the new book recently published by Jim Sweeney, Director of Stanford's Precourt Energy Efficiency Center.

10. Setting up the Federal Government for Success

In addition to identifying substantive policy recommendations for the next President's climate agenda, the Stanford project has focused on "governance" questions – that is, how the next President should set up his or her Administration for success.

One of the key governance questions is how to best deploy the cabinet agencies to implement a comprehensive climate agenda. A discussion paper prepared in advance of the May conference reviewed the track record of a number of Obama Administration interagency climate change initiatives. It concluded that the White House works best when it develops policy initiatives on behalf of the President. It was the White House, for example, that brought together the many White House and cabinet offices needed to develop President Obama's climate blueprint. And it was the White House that made the final calls on key policy choices.

When it comes to implementing policy initiatives, however, the Stanford study and report suggested that agencies – and not the White House – are best positioned to take the lead, since they have the budget, staff, jurisdiction and know-how to convert policy pronouncements into on-the-ground realities. The White House still has an important role. As John Podesta described at the May conference, it is more of a shared execution role, with senior White House officials communicating regularly with senior cabinet

officials, providing encouragement, assistance and, where appropriate, a nudge, to ensure that the White House climate blueprint is moving forward at the agency level.

Unique challenges presented by the climate agenda also may require the White House and cabinet to explore new mechanisms to exploit their relative strengths. In particular, a strong White House voice, backed by strong agency leadership, will be needed to avoid parallel, but inconsistent, agency approaches to shared challenges associated with the deployment of clean energy, responding to climate impacts, addressing infrastructure needs, and the like.

The development of shared service centers, for example, is one option that has significant upside potential in the climate arena. Rather than having each of the major agencies develop their own mapping services that depict current and projected climate impacts on resources and infrastructure, for example, a consolidated mapping service should be developed, as noted in the Hayes paper. Similarly, the federal government is well situated to develop clearinghouse services that can provide data and case studies that will assist local and regional leaders who are grappling with climate impacts.

Finally, there was significant discussion at the January workshop in Washington about how the White House should be organized internally to develop and address a climate agenda. Concerns were raised about the multiple White House offices that all have pieces of the climate pie, from the Council on Environmental Quality; the Domestic Policy Council's climate change and energy office; the White House Office of Science and Technology; the National Security Council; the Economic Security Council; and OMB. Discussants offered a variety of organizational options around a consistent theme of consolidating a policy and coordination function at a high level, close to the President, and inclusive of all major aspects of the climate challenge, including environmental issues, energy issues, financial issues, climate impact issues, and the like. The goal is to avoid a diffusion of responsibility and accountability in the White House for strategic direction, coordination, and outreach.

Conclusion

The body of work produced by the Stanford Climate Implementation Project provides the next President's climate team with important observations and recommendations that deserve serious attention.

This short summary provides an overview of some of the most notable areas of discussion. We urge interested parties to consult with the key conference summaries, papers, and videos that are available on line for a more in-depth discussion of these, and other, important substantive and governance issues associated with our nation's climate change challenge.

