

CLIMATE  
+  
ENERGY

# We can power the world—and avert the worst impacts of climate change.

**New carbon-cutting programs in China and California. U.S. national action to slash carbon pollution from the power and transportation sectors. And an ambitious new strategy for accelerating clean energy. All this offers hope that global warming pollution can be limited before it is too late.**



## U.S. energy use



**Goal:** Hasten the transition to clean, low-carbon energy in the United States.

**Why:** The U.S. is the world's largest economy and the second-largest emitter of greenhouse gases. The clean energy economy will drive a new era of prosperity.

**Contribution to global warming:** 11%\*

### Our objectives by 2015:

- 1/ California power plants and other emitters cut emissions by the required amount or more to meet the state's declining limits.
- 2/ EPA finalizes carbon pollution limits for power plants and large diesel trucks.
- 3/ Secure changes in the rules that govern the electric grid to lock in a substantial cut in carbon pollution by 2018.

### EDF leadership:

**Jim Marston**, VP U.S. Climate & Energy

**Vickie Patton**, General Counsel

**Jeremy Symons**, Senior Director, Climate Policy

\*100-year time horizon

## China energy use



**Goal:** Hasten the transition to clean, low-carbon energy in China.

**Why:** China is the world's largest emitter of greenhouse gases. The commitments China makes in its next five-year plan will determine the country's impact on global warming for decades to come.

**Contribution to global warming:** 18%\*

### Our objectives by 2015:

- 1/ China's seven pilot carbon reduction programs achieve their goals.
- 2/ China is on track to increase renewable energy to 15% of total electricity generation and to cap coal consumption by 2015.
- 3/ Training of more than 20,000 environmental enforcement officers in all 33 of China's provinces is completed.

### EDF leadership:

**Daniel Dudek**, VP

**Zhang Jianyu**, Managing Director

## Agriculture & deforestation



**Goal:** Reduce emissions from agriculture and deforestation.

**Why:** Protecting rainforests offers a huge, immediate payoff. Better farming practices can boost food security and resilience while curbing carbon emissions.

**Contribution to global warming:** 22%\*

### Our objectives by 2015:

- 1/ China is on pace to enlist 20 million families in low-carbon farming by 2016.
- 2/ Brazil sustains progress toward its goal of reducing deforestation rates by 80%.
- 3/ Acre, in Brazil, establishes a program to produce high-quality forest carbon credits.
- 4/ California broadens its carbon market to authorize the use of such credits.

### EDF leadership:

**Nathaniel Keohane**, VP International Climate

**Stephan Schwartzman**, Director

**Richie Ahuja**, Regional Director

## Climate accelerants



**Goal:** Cut emissions of climate accelerants.

**Why:** Short-lived but potent greenhouse gases—"climate accelerants" such as methane and some fluorinated gases—have an outsized impact on global warming.

**Contribution to global warming:** 16%\*  
(but up to 38% on 20-year horizon)

### Our objectives by 2015:

- 1/ Studies quantify methane leakage in the U.S. natural gas supply chain.
- 2/ Major reductions in methane emissions from the supply chain are secured, and are on track to be reduced to 1% or less.
- 3/ California's carbon market incorporates methane reductions from rice farming.
- 4/ EPA tightens limits on methane from landfills and oil and gas operations.

### EDF leadership:

**Steve Hamburg**, Chief Scientist

**Mark Brownstein**, Associate VP Energy

## EDF HELPS USHER IN THE LOW-CARBON ERA

Cleta Felzien does not consider herself part of the new energy revolution. But on her ranch in Colorado, in addition to cows, a well-used tractor and a faded pink and white house, seven brand-new GE wind turbines spin lazily in the High Plains breeze.

“That wind is putting my son through college,” says Felzien.

Buying Felzien’s wind power is Minneapolis-based Xcel Energy, one of the utilities EDF is helping guide into the new energy economy. Since 2005, Xcel has reduced its carbon emissions by 18%.

America’s transition to clean energy is accelerating—more than half of new U.S. power capacity last year came from wind and solar. That trend will continue, thanks to the Climate Action Plan announced by President Obama in 2013, an ambitious effort to establish U.S. leadership in the fight against global warming. The plan’s centerpiece: tough standards to slash carbon dioxide emissions from America’s new and existing power plants.

When implemented, the standards will represent a major victory for EDF and its allies in the struggle to slow global warming. This battle isn’t over, but 2013 will be remembered as the year when the United States got serious about its largest source of carbon pollution—600 coal-fired power plants, 40% of the problem.

# 84

different hazardous air pollutants emitted by coal-fired power plants

# 150

proposed coal-fired plants canceled nationwide



**The U.S. has never limited carbon pollution from power plants. That’s finally changing.**



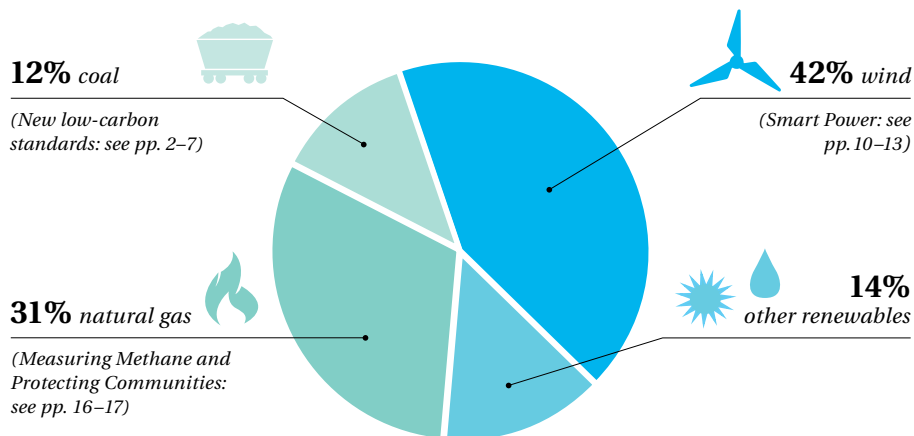
Dealing with this massive pollution took a decade of effort by EDF and others. We played a key role in Supreme Court cases that affirmed EPA's authority to regulate greenhouse gas emissions.

When EPA missed a deadline in April 2013 to release its new power plant standards, EDF threatened legal action. “We never gave up,” says EDF’s general counsel Vickie Patton.

Once the standards were proposed, the coal industry petitioned the U.S. Supreme Court to strip EPA of its authority over carbon pollution. EDF sprang into action. Joining 17 states, we urged the Court to deny the petitions. And our Action Fund ran TV ads in eight states, mobilizing citizens to shore up support in Congress.

The proposed standards remain on track, but a well-funded coal lobby is trying to strong-arm Congress to cut funding for EPA. The best arguments against that lobby are the hard-headed calculations of the energy industry itself. Our partnership with Xcel

## NEW U.S. POWER CAPACITY IN 2012



Note: Numbers do not add to 100 due to rounding.



“I love the turbines. You can’t drought them out and you can’t hail them out.” *Cleta Felzien, Colorado rancher*

has helped transform states into test beds for the low-carbon future. When the Obama administration wavered, we made sure these business voices were heard.

“EDF and power companies are working together to show that commonsense progress is possible,” says Patton, who led our legal team in defending the standards. “We demonstrated that even in fast-growing states, you can provide reliable, low-cost energy and make dramatic cuts in global warming pollution.”

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**Ben Fowke / CEO Xcel Energy**


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**“Our customers demand clean energy but want it at an affordable price.”**

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Denver’s Cherokee power plant was once the area’s largest source of carbon pollution. Today, the coal-fired plant is being replaced with wind energy and natural gas, and the city’s notorious “brown cloud” is largely history.

For a decade, EDF worked with Cherokee’s owner, Xcel Energy, to anticipate pollution regulations, retire aging coal plants, and transition to modern clean energy resources. **“Our partnership led to breakthrough solutions for the environment,”** says Xcel CEO Ben Fowke.

Today, Xcel is the nation’s leading utility for wind power. The company estimates its clean energy projects will ultimately save ratepayers \$800 million in fuel costs. **“Our customers demand clean energy but want it at an affordable price,”** says Fowke. **“With partners such as EDF, we found a way to deliver it.”**

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**ENVIRONMENTAL DEFENSE ACTION FUND: A VOICE FOR CLIMATE ACTION, HEARD IN THE RIGHT PLACES**


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Early in 2013, it wasn’t clear that the Obama administration would act to clean up power plants. **“We were up against well-funded interest groups doing all they could to block this,”** says Carol Andress, our climate legislative director. **“But direct advocacy with policy makers helped cut through those arguments.”**

The Environmental Defense Action Fund gave legislators on both sides of the aisle the information they needed to support strong power plant standards. The administration moved forward to propose standards, and while the coal lobby is still fighting, the Action Fund won’t rest until tough standards are made final.

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**“We are making sure power plant pollution is a constant issue in front of decision makers.”** Carol Andress, *Climate Legislative Director*

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## CALIFORNIA'S BOLD EXPERIMENT PUTS A PRICE ON CARBON

A year ago, California kicked off America's most ambitious climate solution—a cap-and-trade program covering 350 of the state's largest greenhouse gas polluters.

Previously, power plants and other high-polluting facilities in the state could dump carbon dioxide into the atmosphere for free. Now they must buy allowances, sold periodically at auction, for whatever amount of carbon they emit. The idea is to drive down carbon emissions by making it more profitable not to pollute.

After four auctions in the first 12 months, all signs point to a robust carbon-reduction market with long-term viability. Prices indicate companies can cut pollution at a reasonable cost.

The auctions also raised almost \$400 million to invest in projects that cut climate pollution and stimulate the clean energy economy.

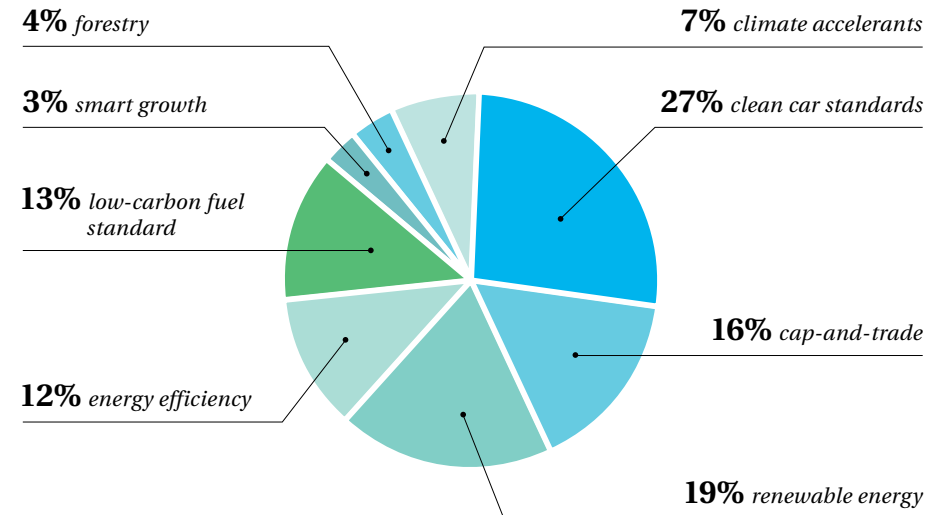
It all started with the state's landmark bipartisan 2006 climate bill, the Global Warming Solutions Act, which EDF co-sponsored and defended in court and at the polls. The law requires the state to reduce climate pollution to 1990 levels by 2020.

In addition to launching the world's largest economy-wide cap-and-trade program, California has set rigorous standards for cleaner cars, renewable energy and low-carbon fuels, sparking

**"As the world's eighth largest economy, California is a model for national—and global—action on climate change." Jim Marston, VP U.S.**

*Climate & Energy*

## WHERE CALIFORNIA'S EMISSIONS REDUCTIONS ARE COMING FROM



*Source: Emissions reductions from Scoping Plan Measures; 2020 GHG Emissions Forecast.  
Note: Numbers do not add to 100 due to rounding.*

innovations in the way utilities generate electricity, automakers design cars and refineries make fuel. For example, the Low Carbon Fuel Standard (LCFS) is driving demand for biodiesel. "Propel relocated to California to benefit from policies like LCFS," says Matt Horton, CEO of Propel Fuels, a biodiesel company.

All this translates into jobs. Clean-tech employment in California has grown four times faster than all jobs in the state. And California has cut carbon emissions by nearly 20% in just five years.

The Golden State's new carbon market has helped set the stage for cap-and-trade programs globally, including the linkage of California's and Quebec's carbon markets in early 2014, and a partnership with China's emerging market.

## FINDING SMARTER WAYS TO POWER OUR WORLD

Imagine a world where homes not only run on clean electricity but also generate, store and sell it.

A world where power companies get paid to conserve and manage electricity, not just produce it. And where the electric grid balances demand with supply to use more renewable energy. We call this vision Smart Power—it's the key to decarbonizing energy.

Electric utilities are at a crossroads. As they replace old, dirty power plants, they can either build more of the same or turn toward low-carbon energy. EDF's Smart Power program helps put the right incentives in place so technology can transform the energy sector as dramatically as it transformed communications.

In nine states that make up nearly half the U.S. energy market, we're working to strengthen clean energy requirements, remove obstacles to investment and realign business models. In Texas, we're part of Pecan Street, a neighborhood "lab" of residential homes that generate, store and sell power. In Illinois, we helped persuade the Commerce Commission to order electric utilities to reduce carbon. And after the devastation of Superstorm Sandy, we worked with the governors of New York and New Jersey to shape new ways to rebuild a more resilient energy infrastructure.

We won't stop until the United States has a modernized energy system. After all, our power grid hasn't been updated since Thomas Edison invented it. It's time for Smart Power.

## SMART POWER: A TRIPLE WIN



### 01 PEOPLE

*Savings, reliability and control*

- > Lower electric bills
- > More reliable power during extreme weather events
- > Control over personal energy use



### 02 ENVIRONMENT

*Less pollution, better health*

- > More renewable energy
- > Less reliance on fossil fuel power plants
- > Improved public health



### 03 ECONOMY

*Energy efficiency and jobs*

- > More efficient use of electricity
- > Fewer blackouts
- > Economic development and good-paying jobs
- > Global competitiveness

"EDF is clearing away the obsolete rules that have stood in the way of a clean energy future." **Julian H. Robertson, Jr.**, *Founder & Chairman, Tiger Management, LLC; EDF Trustee*

## EDF CLIMATE CORPS: A NETWORK OF YOUNG ENERGY LEADERS



EDF Climate Corps trains graduate school students to find energy savings, then embeds them at businesses and public institutions for a summer. Since the program's inception in 2008, Climate Corps fellows have identified nearly \$1.3 billion in energy savings—enough to power 180,000 homes annually over the lives of the projects. Our 400 alumni are rapidly becoming the next generation of green leaders, with 80% of them now working in sustainability at leading companies. Many are hired by their host firms.

Often, the energy fixes they find are surprisingly simple. One fellow at a supermarket chain wondered why some freezer doors had heaters while others had energy efficient anti-fog film. He found an anti-fog product that could be retrofitted to existing doors. That could cut CO<sub>2</sub> emissions by 26,000 tons a year.

While EDF Climate Corps fellows find immediate energy savings, they also focus on goal setting, financing and data management. The goal? To make energy efficiency a corporation-wide activity.

## AS GLACIERS RECEDE, A CLIMATE ACTIVIST IS BORN



**“For me, sustainability is more than a field, it’s how you approach everything.”** Nicolas Gordon

A native of Chile, Nicolas Gordon became concerned about climate change while working as a trekking guide in Patagonia and observing how glaciers shrank “on a weekly basis.” As a 2013 EDF Climate Corps fellow, Gordon worked at AIG in New York City, where his recommendations, which included adding sun window films to reduce the air-conditioning load, could save \$500,000 in operating costs annually. “For me, sustainability is more than a field, it’s how you approach everything,” says Gordon.

**“If you are unsure how to jump-start your company’s energy efficiency journey, EDF Climate Corps provides the best path forward that I have found.”** Scott Tew, Director, Center for Energy Efficiency & Sustainability, Ingersoll Rand



## EDF AND LABOR JOIN FORCES

To stay competitive in the global economy and keep workers engaged, companies are taking a second look at how they use—and sometimes waste—energy.

EDF has teamed up with the labor union IUE-CWA to conduct energy “treasure hunts” at several manufacturing plants.

**“What’s good for the environment is good for labor—and good for company profits,”** says EDF project manager Brendan FitzSimons. In the future, the union plans to expand the treasure hunts and conduct them at many other workplaces. A key goal: making energy efficiency part of the culture at these plants, not something to think about once or twice a year.

**“It’s one thing to say, we need a greener planet. But when you can go to the plant manager and say, ‘Here’s your greener planet, and here’s \$20,000 too,’ it’s a little more interesting.”** Mark Phair, *Facility Manager,*

*Siemens engine plant, Cincinnati, OH*



## Bill and Susan Oberndorf

A commitment to safer natural gas drilling



**“If we don’t get the environmental piece of it right, it could have all kinds of negative consequences.”**

Bill Oberndorf

San Franciscans Bill and Susan Oberndorf made a generous donation in 2012 to support EDF’s work on natural gas. **It was their first-ever donation to an environmental group.**

“What drew us to the work is that natural gas can be a game changer for the country in many, many ways,” says Bill.

“But if we don’t get the environmental piece of it right, it could have all kinds of negative consequences. We wanted to invest in helping to get it right.”

Susan adds, “As we did our research on who was really doing good work in this area, EDF kept popping up as the name that was trusted and respected, both in the environmental community and in the business community.”

To the Oberndorfs, it’s critical that America be able to secure the economic and low-carbon potential of its abundant shale gas reserves.

“If we’re able to do that,” says Bill, “we will have achieved a great win-win.”

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## EDF TAKES THE MEASURE OF METHANE



The number of shale gas wells in the United States has tripled since 2005, yet no one knows how much gas is leaking from wells, pipelines, storage and distribution facilities.

Determining leakage rates is critical because natural gas is mostly methane—a greenhouse gas many times more potent than carbon dioxide. If too much gas is escaping, it would erase over the medium term the climate advantage natural gas has over other fossil fuels, which emit more carbon dioxide when combusted.

In 2012, EDF—in collaboration with 90 academic researchers and companies—launched a series of 16 research projects to measure methane emissions along the gas supply chain. Researchers, led by the University of Texas, published in 2013 the first data on methane emissions from hydraulically fractured shale gas wells.

Our goal is to ensure that industry minimizes methane leakage from the production, transportation and use of natural gas.

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## PROTECTING COMMUNITIES AND PUBLIC HEALTH FROM UNACCEPTABLE NATURAL GAS IMPACTS



EDF is fighting to end irresponsible natural gas development through strong regulation and industry partnerships. Among 2013's successes:

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**PENNSYLVANIA:** We helped create the Center for Sustainable Shale Development, establishing 15 leading practices for shale gas development. The program will include third-party audit, much as Green Building Council oversees LEED standards for buildings. *The Washington Post* called the Center “a heartening breakthrough in the war over fracking.”

**TEXAS:** The state thoroughly overhauled its outdated well construction requirements. The improvements included many ideas contained in a model regulatory framework developed by EDF and Southwestern Energy. The new regulations will increase protections for groundwater and serve as a model for other states. Now we're helping Texas focus on the issue of wastewater disposal.

**WYOMING:** We partnered with local environmental groups to successfully advocate new measures to reduce air pollution. We also helped Governor Matt Mead (R) draft sound rules for protecting groundwater.

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“EDF’s knowledge of oil and gas issues is a major asset to advancing our efforts to improve protections for Pennsylvania citizens.” John J. Walliser, Vice President, Pennsylvania Environmental Council

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## EDF IN CHINA: ACCELERATING THE SHIFT FROM COAL TO CLEAN ENERGY

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China burns over half the world's coal. And though coal has fueled prosperity, it is also the primary reason that China tops the list of the world's worst carbon polluters. In 2013, with EDF's help, China launched the first of seven carbon trading pilot programs designed to clear the air by improving energy efficiency and accelerating the shift to cleaner energy sources such as wind. The pilots will eventually cover 250 million people in Shenzhen, Beijing, Chongqing, Shanghai, Tianjin, and the provinces of Guangdong and Hubei.

EDF began a formal collaboration with Shenzhen last November, providing technical support and training to officials designing the first pilot. The project will limit emissions from 635 companies responsible for about 40% of the city's carbon pollution. Companies able to reduce their emissions below their limit can sell unused permits to companies unable to meet their targets—creating a financial incentive to reduce emissions while ensuring strong environmental results.

EDF also helped broker an agreement between Shenzhen and California, the first U.S. state to develop its own state-of-the-art emissions trading system. This cooperation opens the door to work on a range of low-carbon strategies, from carbon trading to electric vehicles.

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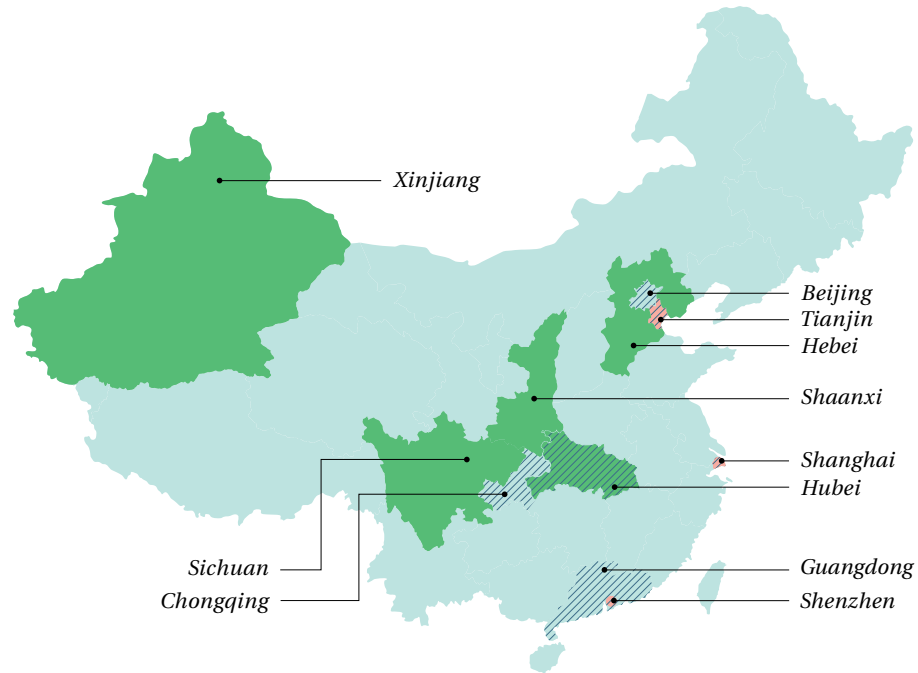
**“We cannot stabilize global climate without a targeted and rigorous campaign to curb carbon pollution in China. The seven new pilots are the boldest experiment yet in that direction.” Daniel Dudek, EDF Vice President**




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## A LOOK AT EDF'S CHINA PROGRAM

This work is urgent. The future of China and the planet are firmly linked.



	<b>CARBON TRADING</b>	EDF is providing technical assistance and training to all seven carbon trading pilots.
	<b>LOW-CARBON FARMING</b>	Farmers in our low-carbon farming pilots are rewarded for adopting climate-friendly agricultural practices that reduce carbon and increase efficiency.
	<b>GREEN SUPPLY CHAIN</b>	Our green supply chain pilots give factories an incentive to slash energy use: if they want to win contracts to supply big purchasers, they must meet environmental requirements.

### IMPROVING ENVIRONMENTAL COMPLIANCE:

15,000



environmental enforcement officers from all 33 provinces trained by EDF

## Children's Investment Fund Foundation

Investing in the next generation



**“Carbon pricing is a must-have. It’s the most cost-effective signal to investors.”**

**Kate Hampton of CIFF**  
*(pictured with EDF Vice President Dr. Daniel Dudek)*

The London-based Children's Investment Fund Foundation (CIFF) is dedicated to improving the lives of impoverished children in developing countries. Since climate change disproportionately affects these children, the foundation is helping reduce carbon emissions.

“The decisions taken in China over the next five years are perhaps the most important in the world on this issue,” says CIFF's climate executive director Kate Hampton. “Carbon pricing is a must-have. It's the most cost-effective signal to investors to fund low-carbon activities.”

That's one reason CIFF decided to partner with EDF to develop carbon trading pilots in China. “EDF has a strong reputation in emissions trading, through its work on sulfur dioxide markets in the United States and China. You can't replicate that starting from scratch,” says Hampton.

“We seek the right combination of experience in an organization. It must be both nimble and focused so it can be efficient and relentless in pursuit of a goal. We're very happy to have EDF as our partner.”

## GREEN AGRICULTURE FOR THE DEVELOPING WORLD



More than 500 million subsistence farmers can play an important role in reducing climate pollution. EDF's low-carbon farming and rural development projects have already reached 700,000 people in China, India and Vietnam. The pilots use economic incentives to reward farmers when they adopt climate-friendly agricultural practices such as the precise application of fertilizer.

In China and India, EDF is helping provide rural families with biodigesters that convert manure into biogas for cooking. This reduces methane emissions and improves the health of thousands of families by eliminating smoky indoor fires.

In South India, EDF scientists are training local technicians to gather field data on greenhouse gas emissions from crops. With our partners, we have set up five labs to analyze gas samples and measure the effectiveness of climate-friendly farming so that poor farmers can be rewarded in the voluntary carbon market.

In a deal we brokered, India's largest airline, IndiGo, allows travelers to partially offset their carbon footprint from flying by buying emissions reductions generated by our farmers.

## A PRIORITY: RAINFOREST PRESERVATION

Around the world, more than one billion people rely on rainforests for their livelihoods. But rainforest destruction accounts for about 15% of global greenhouse gas emissions. EDF is working in Brazil and Mexico to make standing tropical forests—and the carbon they contain—more valuable than logging. Our strategy would reward indigenous people for protecting their forest homes, and allow countries that reduce deforestation to sell greenhouse gas reductions in the carbon market.

EDF brokered a deal in which California, the Brazilian state of Acre and the Mexican state of Chiapas agreed to develop guidelines for allowing forest preservation credits into California's new burgeoning carbon market.

“Opening California's carbon market would be a powerful signal to rainforest nations that the world values the climate and ecosystem services they provide.” Dr. Stephan Schwartzman, *EDF Tropical Forest Director*



## The Hon. George P. Shultz / Former U.S. Secretary of State

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“EDF does constructive, thoughtful, hard work, and that gains respect—and results.”

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George Shultz has served two presidents in four cabinet-level positions—only the second man in American history to have done so.

“The world responds when the United States leads,” says Shultz. “The principal country we need to work with today is China. Climate change is a big problem for them and they’re ready to work on it.”

Shultz advises EDF on a range of issues, including global warming and natural gas, where his decades of experience have proved invaluable in bringing diverse groups together. “EDF does constructive, thoughtful, hard work, and that gains respect—and results,” he says.

At 92, Shultz is in step with the times: he drives an electric car and charges it with solar panels on his roof.

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