EDF ENVIRONMENTAL DEFENSE FUND®
Finding the ways that work

Solutions

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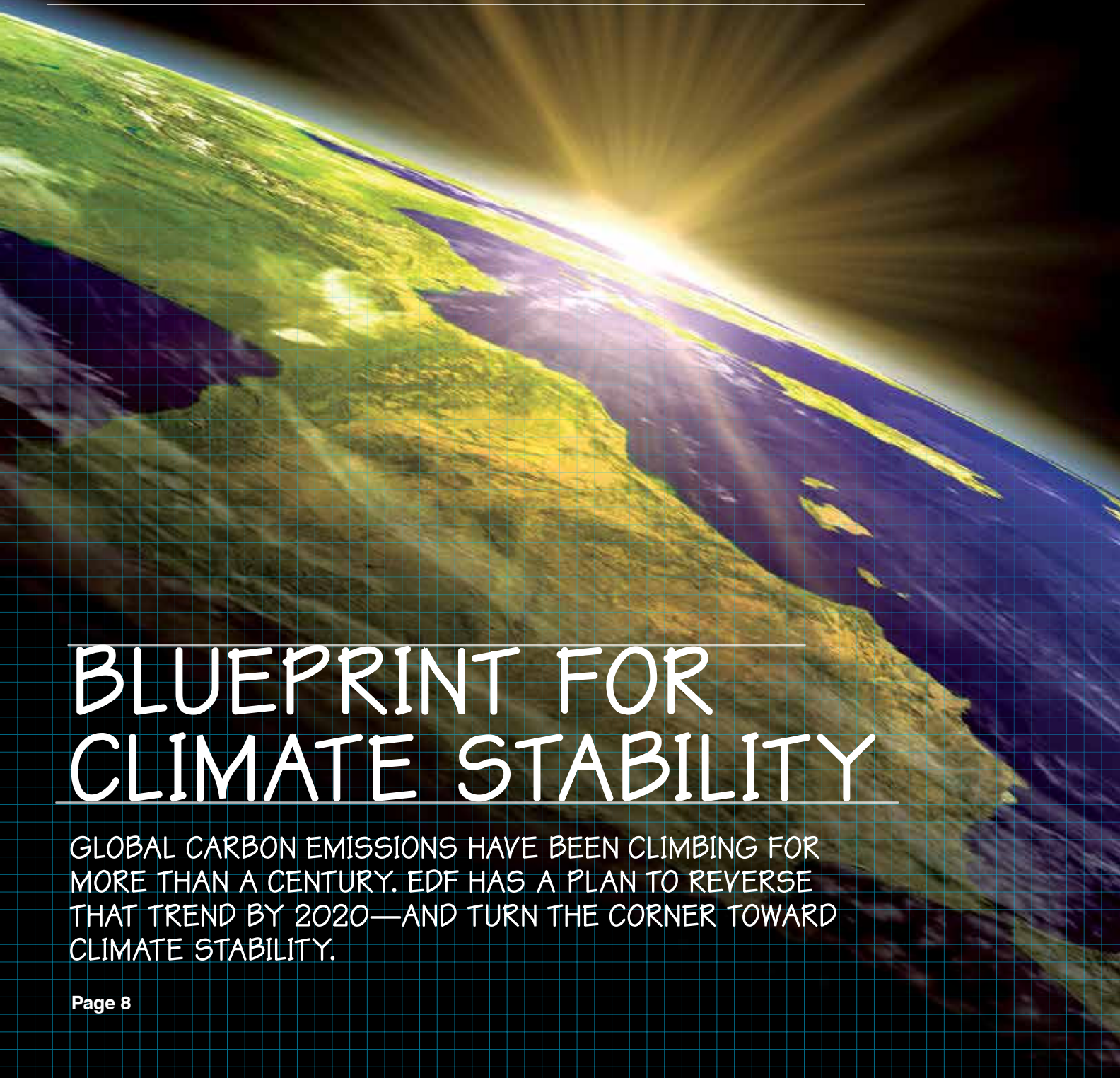

BLUEPRINT FOR CLIMATE STABILITY

GLOBAL CARBON EMISSIONS HAVE BEEN CLIMBING FOR MORE THAN A CENTURY. EDF HAS A PLAN TO REVERSE THAT TREND BY 2020—AND TURN THE CORNER TOWARD CLIMATE STABILITY.

Page 8

A world apart

President Obama recently announced the world's largest network of marine protected areas, expanding a reserve that EDF was instrumental in creating in 2009. Larger than California and Texas combined, the Pacific Remote Islands Marine National Monument is a biodiversity hotspot rich in ancient coral reefs and seamounts. The area is now off limits to deep sea mining and most commercial fishing—forever.


PACIFIC STOCK

2014: The year in review

IN NOVEMBER, WHEN PRESIDENT OBAMA AND Chinese President Xi Jinping announced ambitious goals to cut global warming pollution, it was more than just another diplomatic handshake. I believe this announcement will change the way nations approach climate action: The argument that America can't act because China won't act can finally be put to rest. This and other breakthroughs in 2014 give me hope that we can still turn the corner toward a stable climate before it is too late *(see story, p. 8)*.

EDF staffers in Beijing are helping China reduce carbon pollution, and I'm proud to say we played a key role in many other notable environmental achievements in 2014. Here are just a few:

Colorado pioneers pollution controls. In February, Colorado adopted landmark regulations to substantially reduce air pollution from the state's oil and gas industry—including the first anywhere in the U.S. to directly control emissions of methane, a highly potent greenhouse gas. The rules, which EDF helped develop, will cut air pollution as much as getting all the cars and trucks off the road in Colorado.

A plan to cut carbon from power plants. In June, EPA proposed the Clean Power Plan, which will impose the first-ever national limits on carbon pollution from power plants. The plan encourages investors, inventors and entrepreneurs to find new ways to cut pollution. And it gives industry flexibility to find the most efficient path to a clean future. More than 480,000 EDF members have raised their voices in support of the plan.

Getting toxics out of the home. Shoppers might assume the law requires chemicals in everyday products like baby lotion to be proven safe, but it's not so. That's why EDF is fighting for strong regulations. In 2014, Walmart rolled out a policy developed with EDF to phase out potentially harmful ingredients in tens of thousands of products in its U.S. stores. Walmart's policy will drive change throughout the industry.

Restoring the oceans to abundance. On the West Coast, groundfish are on the rebound, largely because of a new management system, called catch shares, that EDF helped implement. In August, the Monterey Bay Aquarium upgraded the sustainability rating of 21 species of Pacific rockfish, flounder and sole in its seafood guide.

A legendary river runs free. For almost half a century, the Colorado River has dried up before reaching the sea. But in 2014 the river again ran its full course, thanks to a deal EDF helped broker between the U.S. and Mexico. A "pulse flow" designed to mimic spring floods provided scientists with clues to revitalize the delta.

These advances resulted from the efforts of many people over many years. We appreciate your steadfast support. It makes our work possible.

Fred Krupp

EDF President

EDF ENVIRONMENTAL DEFENSE FUND®

Finding the ways that work

Environmental Defense Fund's mission is to preserve the natural systems on which all life depends. Guided by science and economics, we find practical and lasting solutions to the most serious environmental problems.

Our work is made possible by the support of our members.

On the cover: Climate change is at our doorstep, with ocean temperatures and sea levels rising faster than scientists expected. We're seeing the effects in extreme weather, habitat loss and ocean acidification. But the news isn't all bad. EDF president Fred Krupp outlines how, with realistic actions in a few key countries, the world's greenhouse gas emissions can peak, level off and begin to decline in the next five years. *Page 8*

Cover photograph: Earth from space: istock

Solutions

Editor Peter Klebnikov

Art Director Janice Caswell

Environmental Defense Fund
257 Park Ave. South
New York, NY 10010

Main number 212-505-2100
Membership questions 800-684-3322 or members@edf.org

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Send feedback to address above or email editor@edf.org

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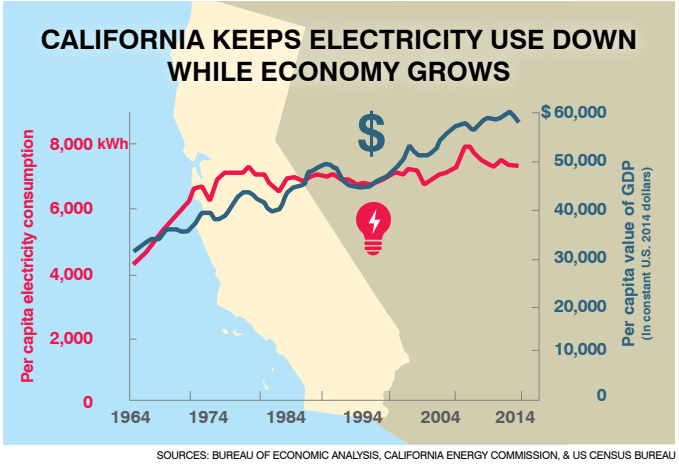
FIELD NOTES

GETTY IMAGES

Peek power: Wringing savings from household energy use.

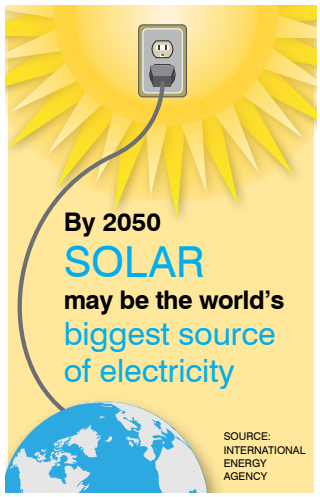
Counting on people, not power plants, to meet energy demand

During the coldest and hottest months, electricity use spikes as people turn up the heat or air conditioning. Meeting this demand requires firing up "peakers," often the dirtiest and least efficient power plants. But with the right incentives and tools, people will adjust thermostats and appliances to reduce demand. Empowering people to reduce or shift power use to off-peak times in exchange for a payment—called demand response—is a commonsense way to save money, promote clean wind and solar energy, and rely less on dirty peaker plants. Until recently, California law required utilities to consider investing in water-intensive, polluting fossil fuel plants to meet peak demand. That's now changing, thanks to EDF's advocacy. Gov. Jerry Brown (D) signed an EDF-sponsored bill accelerating the use of demand response. "As California modernizes its power grid, EDF hopes the rest of the nation will follow suit to create a cleaner power grid," says Lauren Navarro, EDF clean energy manager.



SOURCES: BUREAU OF ECONOMIC ANALYSIS, CALIFORNIA ENERGY COMMISSION, & US CENSUS BUREAU

SOURCE: REPORT – PERI, UMASS AMHERST, CENTER FOR AMERICAN PROGRESS



Cleaner trucks are a big hit

Last year was a banner year for truck sales, which ran 20% higher than in 2013. What's helping drive the boom is the fact that 2014 heavy trucks have lower operating costs. They use less fuel thanks to strong federal efficiency standards EDF helped push through. "Federal standards can foster the innovation necessary to bring lower-emitting trucks to market," says EDF manager Jason Mathers. "In 2015, we can make these standards even better." The new standards will cut CO_2 emissions from heavy trucks by 298 million tons over the life of all trucks produced between 2014 and 2018.

JOHN RAE

U.S. moms fight back on climate

No one is more fiercely protective of her child's health and safety than a mother. When outgoing Pennsylvania Gov. Tom Corbett (R) last year signed a bill giving politicians authority to veto *any* climate plan required by EPA's Clean Power Plan, Moms Clean Air Force (MCAF) jumped into action.

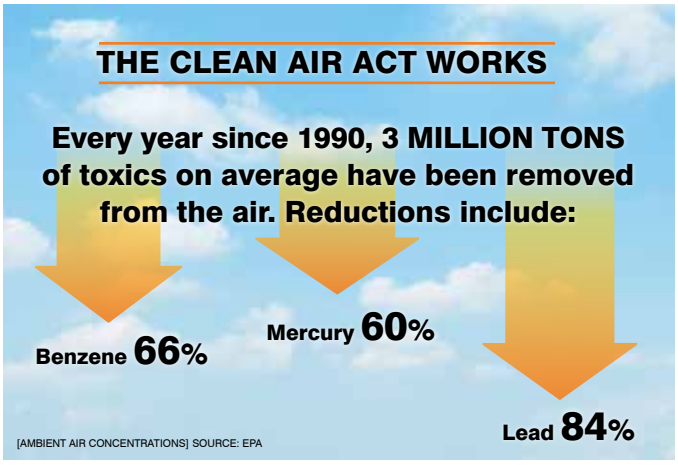
"This bill puts politics over science and the health and safety of Pennsylvania families at risk," says MCAF's Gretchen Dahlkemper. Power plants account for 46% of the state's carbon pollution.

The EDF-backed band of mothers is taking its case to the new governor, Tom Wolf (D), who will take office in January. "Our hope is that the governor will take a leadership role and craft a plan that meets EPA's goals and grows the economy," says Dahlkemper.

WHAT EDF STAFF ARE SAYING

“Families should not have to wonder if the products they buy are safe. Our kids shouldn’t be treated like lab rats subjected to untested chemicals.”

—EDF scientist Dr. Richard Denison



The modern American family

JULIA ROBINSON

Who doesn’t want a cheaper electric bill? This was EDF’s most shared Facebook post of the year. Get up-to-the-minute news and become part of the conversation at facebook.com/EnvDefenseFund.

THOMAS BARWICK/GETTY IMAGES

Reel reform: Urging anglers to come on board.

The case for reforming recreational fishing nationwide

In the Gulf of Mexico, the commercial catch share program for red snapper, which EDF helped design, has been a huge success. Since the program began in 2007, the Gulf snapper population has more than tripled.

But recreational fishing, which accounts for half of landings, is not part of the program and is poorly managed, leading to large discards of fish. Recreational fishermen have exceeded the biologically sustainable catch limit by 50% over the last couple of years.

EDF helped win a legal victory in March requiring improved management. We also helped recreational fishermen launch a catch share pilot program for headboats, or large charter boats, which could be a model for managing recreational fishing.

The initiative, called the Gulf Headboat Collaborative, had 17 vessels in 2014. One partner was Randy Boggs, who operates Reel Surprise Charters out of Orange Beach, AL. “Last year was one of our best years ever,” he says. “We stayed within our quota, made more money and have been totally sustainable.” Member boats can take customers fishing year-round under strict catch limits, while those not in the program could only fish nine days in 2014. Twenty boats have signed up for 2015.

“Charter boat captains have incentives similar to commercial fishermen,” says EDF economist Dr. Daniel Willard. “Their livelihoods depend on a healthy fishery.”

WHY EDF IS TACKLING RECREATIONAL FISHING

72 million
fishing trips taken annually

11 million
saltwater anglers

$30 billion
industry

MILLENNIALS RISING

At 80 million strong, the millennial generation is the largest in American history. Now, with help from EDF, these young people are starting to speak up—and vote—for the environment.

ORMI BOCI

Elaine Phillips, a Colorado State University student, holds up a card pledging to vote for climate protection.

Defend Our Future recruits young voters

MILLENNIALS NOW OUTNUMBER baby boomers—and they care deeply about climate. The problem is, they don't often vote in midterm elections.

In last November's elections, an EDF campaign aimed at getting millennials to the polls gathered more than 125,000 pledges to vote for climate action. More than 100,000 of those pledges came from Colorado, the pilot state for the new effort.

The nonpartisan campaign, Defend Our Future, used a mix of digital, social media and data targeting technologies, along with traditional boots-on-the-ground organizing, to collect the pledges. The campaign started with organizers at Colorado State University and the University of Colorado Boulder. Our partners included national groups such as Voto Latino and Rock the Vote. National polling shows that Latino voters overwhelmingly support climate action.

The campaign worked: the turnout among young voters in Colorado improved by more than 20% over turnout in the last midterm election in 2010. "I'm 20 years old, so climate change will have a huge impact on my life," said Bianca Buium, the 100,000th person to sign the pledge. "I haven't been involved in politics before, but if we just ignore this problem, politicians will, too."

In future elections, Defend Our Future will expand to other states.

"Millennials will live with the most serious consequences of climate change," says Dr. Alicia Kolar Prevost, who directs the initiative. "They care, and they'll be voting for years to come."

MEMBER SPOTLIGHT

EDF's new Ambassador Community

There are activists. Then there are superactivists—like Sarah Davis. She's an EDF lead ambassador, part of a network of committed doers who are rallying their communities to defend the environment.

Launched in early 2014, EDF's Ambassador Community provides a way for people to share their passion for the environment with friends and neighbors. It now has chapters in California, Massachusetts, New York and North Carolina, with more launching soon. "Our members want to do more than write a check," says project manager Alysa Perez. "They want to get involved locally." When EDF approached Davis to lead a chapter in Raleigh, NC, "I was nervous," recalls Davis, who works as an air quality specialist. "But EDF staff were so helpful. I've learned so much."

Davis's mission is to raise awareness of climate change. "Often people don't understand how it's affecting them locally now," she says. A champion of environmental causes, she spent a summer rescuing injured sea turtles. Today, she's recruiting like-minded folks in Raleigh to make their voices heard. At one event, the speaker offered tips on how to talk to climate deniers. "If you can influence just a few people," says Davis, "they will influence others." Hers is now the largest chapter.

Join a chapter, become an ambassador and spread the word! Learn more at ambassadors.edf.org

SARA D. DAVIS

For Sarah Davis, activism means more than just pressing a button.

ZHU LIMENG

Going global: EDF Climate Corps fellows Wei Shao (left) and Yinghuang Ji (right) tour a Chinese factory with Keysheen Industry manager Eric Ling.

Young energy sleuths hunt carbon pollution

When Gina Melekh was growing up in St. Petersburg, Russia, her mother washed and reused plastic bags, and dried the laundry on a clothesline strung in the kitchen. Arriving in the United States at age 19, Melekh was thrilled with America's abundance, but also shocked.

"It was painfully obvious how wasteful society is," she says.

As an EDF Climate Corps fellow in 2014, Melekh is doing something about that waste and helping fight global warming at the same time. Working for the City of Baltimore, she designed an energy roadmap for the city government and presented her plan directly to the mayor. City officials were so impressed they offered her a full-time job to implement her plan.

"Most people get an MBA to go into banking. I went the other way—I left banking and got an MBA to promote sustainability," says Melekh.

EDF Climate Corps pairs graduate students with businesses, universities and cities, where they ferret out energy waste. Since the program's inception in 2008, more than 500 Climate Corps fellows have uncovered $1.4 billion in energy savings—enough to avoid the annual emissions of 400,000 cars. Among the 305 participating organizations that have hosted fellows are Apple, McDonald's and Walmart. Cities served include Atlanta, Boston and Los Angeles.

Many companies are repeat customers. Says Christina Page, director of climate and energy strategy at Yahoo!: "We are saving tens of millions of kilowatt hours per year from projects identified by our first Climate Corps fellow. We jumped at the chance to sign up again."

In 2014, EDF Climate Corps took on waste in commercial real estate in Chicago. Through Climate Corps, EDF partnered with the city and placed ten fellows at two dozen Chicago buildings. They helped building operators identify $1.6 million in savings.

Pakistan native Abdul Wadood, an engineering management graduate student at Duke University, spent the summer at the Merchandise Mart. Armed with a floor plan and a clipboard, Wadood tracked the building's after-hours energy use by reading hundreds of electric meters over the course of two nights. These two all-night treks revealed that one-third of tenants were responsible for 90% of nighttime energy use. Wadood then developed strategies to help those tenants lower their energy use.

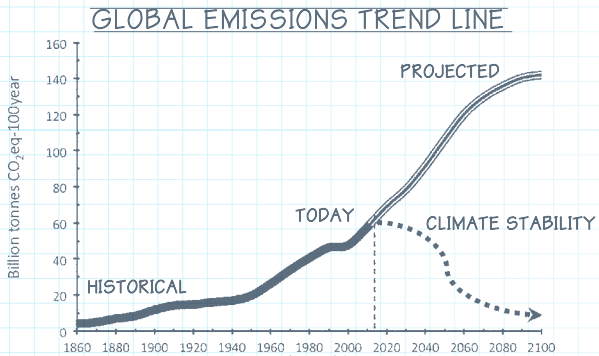
A key goal of EDF Climate Corps is to change the way institutions use energy. China was an obvious target, and in 2014, our fellows were invited to work there as well. Six fellows found energy savings at Apple, Cummins, Legrand, McDonald's and Walmart facilities in China.

Whether it's in China or Chicago, EDF Climate Corps fellows form a new generation of green leaders. Sixty percent of them go on to work in fields related to sustainability—and 100% leave the program equipped to become strong leaders in the fight against climate change.

DOUG KAPUSTIN

Baltimore's energy maven Gina Melekh.

A plan for climate stability



By Fred Krupp

EDF'S PRESIDENT SURVEYS FIVE POWERFUL TRENDS THAT ARE DRIVING MOMENTUM FOR CLIMATE ACTION AND DESCRIBES AN AMBITIOUS PLAN TO REIN IN GLOBAL EMISSIONS BY 2020. WE CAN'T DO IT ALONE—BUT TOGETHER, WE CAN TURN THE CORNER TOWARD A SAFER CLIMATE.

KEVIN WOLF

EVERY DAY BRINGS ANOTHER frightening headline about climate change, so I'm inspired whenever I see some truly positive news. Some of the best climate news ever came in November, when the United States and China made a historic announcement to cut global warming pollution.

A *New York Times* editorial called it "a major breakthrough" that sends a powerful signal to the rest of the world. I call it a game-changer, and it's one of the reasons I am optimistic we can prevail against climate change. Here are my Top Five Reasons for Hope:

1. The China–U.S. announcement sends the most powerful market signal ever for clean energy. The world's two largest greenhouse gas emitters have committed themselves to the clean energy path. Each recognizes the danger of being left behind in what amounts to a 21st century arms race—the battle for dominance of the new energy economy. More importantly, each recognizes the urgent need to control greenhouse gas emissions.

With this announcement, the argument that the United States can't act because China won't act has finally begun to fade. Spurred by severe air pollution and the growing costs of climate impacts, China committed to having its carbon emissions peak by 2030 at the latest. To meet this pledge, the country must act now to deploy a suite of actions, including ramping up investment in solar and wind energy. With EDF's help, the Chinese have already launched seven pilot carbon trading programs, covering almost 250 million people and 1.3 billion tons of carbon. Beijing also recently announced its intention to create a national carbon market by 2016.

The American commitment—to cut emissions by 26–28% below 2005 levels by 2025—ensures that clean energy will get a major boost in the United States, meaning more jobs and less pollution at home. One big step toward that goal is EPA's proposed Clean Power Plan, which will limit carbon pollution from its largest source, the power sector—a policy supported by two-thirds of the American people. But in both China and the United States, further reductions and a deeper level of ambition will be needed.

2. Emissions in the industrialized world are trending downward. My second reason for optimism is that we're seeing results now: In both the United States and Europe, greenhouse gas emissions have been dropping. From 2005 to 2012, the EU reduced carbon dioxide emissions by about 13%. And in the United States, we have cut emissions by about 10% over that time. There have been upticks in the last two years, which we should not ignore, but the overall trend is clear: our economies are demonstrating that they can grow and decarbonize at the same time. Most of these reductions were due to the replacement of coal with natural gas, energy efficiency and the growth of renewables.

3. The clean energy future is now. The price of solar panels has been cut 80% since 2008, and the United States added more solar capacity in the past two years than in the previous 30 years combined. Texas and Kansas are showing what is possible with wind power. (At one point last year, wind generated nearly 40% of Texas' electricity.) Electric vehicles have become trendy. In Nevada, Tesla is building the world's largest advanced automotive-battery factory. In New York, Solar City is building a massive solar-photovoltaic factory. Market leaders like Google and Walmart are making huge investments in renewable energy and energy efficiency. And America is poised to invest $2 trillion over the next 20 years in the electric grid. With the right policies, this could transform the way the nation creates, conducts and consumes power.

4. We're taking action on methane. My optimism goes beyond carbon. Methane is 84 times more dangerous to our climate than carbon dioxide over a couple of decades, and the oil and gas industry may be emitting more of it than we thought. Methane accounts for one-quarter of the warming we are now experiencing. If that doesn't sound like a reason for optimism, then think of it like this: Here's a major contributor to climate change that we can reduce at bargain prices. A recent report found that we could cut methane emissions from the oil and gas industry by 40% with technology that exists today. The cost? A penny, on average. That's right: We can stop almost half of methane leakage from industry, and the cost of a thousand cubic feet of natural gas would inch up from $3.95 to $3.96.

5. The kids are alright. Finally, the demographics are on our side. Younger voters overwhelmingly support climate action, as do important voting constituencies such as African Americans and Latinos. Eighty-five percent of people under 30 support limits on carbon pollution from power plants. It doesn't take a political strategist, or an actuary, to understand that these people will be voting for far longer than those over 65—the least supportive cohort.

For all of these positive signs, we are

(PLAN CONTINUES ON NEXT PAGE)

(CONTINUED FROM PAGE 9)

still in the race of our lives with a very long way to go.

SO WHAT'S THE PLAN?

To assess what needs to be done by EDF and many others, we spent more than a year talking to allies and experts from academia and industry. Through that process, we arrived at some principles that led to a plan of action.

First, we determined that an ambitious goal is achievable: We can turn the corner toward climate stability by 2020. That means stopping once and for all the centuries-old rise in total greenhouse gas emissions, and seeing those emissions peak, level off and begin to decline. This can happen in the next five years—if countries devote sufficient attention to the task. And it can be done with current technology and at reasonable cost.

For the United States, turning the corner means imposing a strict limit on carbon pollution from power plants and making sure the billions that will soon be invested in the nation's electric grid are invested wisely. For China, it means the nation must, by 2020, cap half of its carbon emissions at 2015 levels, improve energy efficiency by 25%, and shift its energy mix to one-third renewable energy, natural gas and nuclear. EDF is helping China achieve these goals.

We also must cut emissions of short-lived climate pollutants—including methane, HFCs (used in some air conditioning) and black carbon—which cause about a third of current warming. EDF is focused on reducing methane leaks. Just a few years ago, almost no one was talking about methane's potential to disrupt the climate. Now we're starting to make genuine progress.

Next, we need to halt deforestation. The destruction of the world's forests is responsible for about 15% of the world's carbon emissions—and the clearing will continue until we make forests like the Amazon more valuable alive than dead. One key strategy is to reward forest protection in a global carbon marketplace. Already, there are encouraging signs: Brazil has reduced its Amazon deforestation rate by 70% over the past decade.

Finally, we learned that the biggest emitters will largely determine the outcome. A global solution is necessary, but what happens in China, the United States and Europe will have the most impact by far. So that's where EDF is focused.

GETTY IMAGES

For the United States, turning the corner means imposing a strict limit on carbon pollution from power plants and making sure the billions of dollars that will soon be invested in the nation's electric grid are invested wisely.

For long-lasting change, we need to address the market failure that caused this problem in the first place: with our allies, we need to change the game, so those who produce the pollution pay the social cost, creating an incentive for a worldwide market correction toward clean energy. It's Economics 101—when it costs nothing to pollute, you get a lot of pollution.

But when there's a price to pay, industry will have a bottom line incentive to find low-carbon solutions. Making climate pollution a cost of doing business is the path that many governments are already taking—from Brussels to Beijing to Sacramento. And this is the path that the United States must take, too.

Which leads to the final imperative: American politics.

The President and EPA have used many—though not all—of the options they have under existing law to cut carbon pollution. These groundbreaking actions are critical, but we cannot solve the climate crisis without Congress. We must find creative ways to engage conservative voters, opinion leaders and elected officials who want to get on the right side of history.

For 2016, we must demand that every presidential candidate propose real climate solutions. No serious presidential contender can ignore this pressing threat to our economy and way of life. That applies to Congress as well. At present, comprehensive climate legislation seems beyond America's reach. Many in the new Congress are focused on tearing down EPA's climate protections.

I believe this is a political mistake that younger voters in particular will not tolerate. A rapidly growing database of such voters is sure to become a potent weapon in future elections. In recent months, 3.7 million people, many of them young, voiced support for EPA's Clean Power Plan. More than 480,000 were EDF members and supporters.

I believe the political stalemate on climate won't last, because I know there are serious leaders on both sides of the aisle who recognize the need to protect this nation from climate change. There are so many reasons for optimism: The price of renewables is dropping; the major emitters are taking action; young voters are fully on board. And the swing toward a clean energy future is fully in motion.

Can we stop climate change in time? It's not just possible—it's more than likely, if we continue to fight.

How you can help

Stopping global warming will require help from everyone, not just decision makers and elected officials. Here are five actions you can take that will reduce emissions:

1. Make your home more energy efficient. Contact your local utility. Get an energy audit of your home and follow the recommendations—adding insulation or plugging leaks, for example. Many utilities and states perform these audits for free.

2. Reduce, reuse and recycle. Recycling just one aluminum can save enough energy to power a desktop computer for four hours.

3. The next time you buy a car or truck, buy one that gets better gas mileage than your present vehicle. Also, walk, bike, carpool or use public transportation whenever possible.

4. Wash clothes in cold or warm water, not hot. And don't use heat to dry dishes in your dishwasher.

5. Sign up for EDF's action alerts (www.edf.org/climateupdates) and stay engaged politically at the federal, state and local levels. Citizen input is vitally important to ensure that decisions about power generation and transportation result in lower emissions.

Reviving fisheries around

The world's most severe overfishing occurs outside U.S. waters, so international engagement is essential. Our aim is to work with governments and local fishermen to make sustainable fishing the norm in countries that account for nearly two-thirds of the global catch.

3 billion
people rely on fish as an important source of protein.

EU: ENGAGING THE BIG PLAYERS

Europe's fisheries are in the worst condition of any in the developed world, with 75% overfished. EDF advised officials of the European Union as they rewrote its fisheries law in 2013, committing Europe to end overfishing by 2020. And in 2014, the EU Parliament passed legislation to fund tools that will support communities making the transition to sustainable fishing. We're also working with fishermen in Spain, Sweden and the UK to improve the economic and ecological performance of fisheries.

SAVING THE SEA'S GREAT PREDATORS

EDF is working with Cuban scientists and fishermen to conduct the first in-depth survey of sharks in Cuba's waters. The research will reveal special places that warrant protection and will inform Cuba's national plan of action for sharks. EDF is a key advisor to Cuban officials on how to safeguard these majestic creatures. The plan could also be a model for managing other threatened migratory species such as tuna.

the world

40%
of global fisheries are in deep trouble

35 million
people make their living in small-scale fisheries

"The best way to revive oceans is to empower fishermen with rights, responsibilities and rewards."

Dr. Laura Rodriguez,
Oceans deputy director, EDF de México

FISH FOREVER

Nearly half the fish that people eat are caught in nearshore fisheries, many of which are unmanaged. EDF has partnered with UC-Santa Barbara and Rare, a global leader in community-led conservation, to provide artisanal fishermen in the developing world with practical solutions to reverse overfishing. Our collaboration, called Fish Forever, is engaged in the Philippines and Indonesia as well as Belize, Brazil and Mozambique.

PRESERVING A WAY OF LIFE IN MEXICO'S GULF OF CALIFORNIA

On the first day of Lent, under a full moon, traditional fishermen head out in the Gulf of California to fish for curvina, a salmon-sized fish native to the area. It's a decades-old ritual that sustains local communities. The fishery is as large as the U.S. red snapper fishery, but overfishing has caused a perennial glut in supply, crashing prices and putting the survival of the species at risk. Historically, fishermen would land thousands of tons in just a few days.

EDF teamed up with regional organizations to create a catch share program for curvina. By bringing together fishermen, government officials and buyers, the community developed an agreement in which each skiff was granted a per-tide allocation for fish. The result? Fishermen are earning 23% more per pound of fish, and the catch is distributed across the entire season.

Catch shares have also reduced the total catch by half, ensuring the long-term health of the population. EDF has now been asked by the hake industry to protect their fishery as well, and the Mexican government is also consulting with us as it considers catch shares nationwide.

AP IMAGES

Of droughts and downpours

Ilissa Ocko is a climate scientist who studies Earth's energy balance and is passionate about communicating science to a lay audience.

What on Earth is going on when New York gets endless rain and California barely any; when one part of the country is freezing while another suffers record heat? Scientists have now tied extreme weather such as California's drought to climate change. Rising temperatures also create extreme contrasts. Here's how:

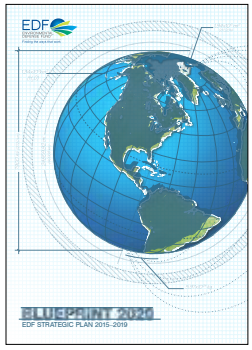
Rain patterns are changing: In the Northeast, more moisture in the atmosphere and changing circulation patterns are bringing more rain. In the Southwest, high pressure systems are suppressing rainfall. Experts suggest that some of these systems are more likely to occur with climate change. As global temperatures rise, more evaporation has led to more moisture in the atmosphere, and this has contributed to more intense rainfall. Even the drought-stricken West is getting more heavy downpours when it does rain.

Droughts take hold: In the Southwest, the drop in rainfall brings drier conditions that magnify drought. As the soil dries out, sunlight heats the ground instead of evaporating water from the soil, creating a vicious cycle.

Flooding in the Northeast: Because soil moisture is increasing there, flooding events in the Northeast are on the rise. A one-foot rise in sea levels since the 1900s contributes to flooding. Unless we reduce climate pollution, these trends will worsen. The Clean Power Plan, which sets the first national limits on climate pollution from power plants, is a vital step toward climate stability.

››› READ FULL STORY ››› edf.org/weirdweather

EDF looks ahead



Imagine a future where clear skies replace choking smog in China's cities, where the Amazon's magnificent rainforests are worth more alive than dead and where global climate pollution is sharply reduced. The world's oceans once again abound in fish, farmers feed a growing world while polluting less, wildlife thrives on working lands and more people enjoy good health with less exposure to toxic chemicals.

This is the world EDF envisions and works every day to build. How do we get there? No organization alone can do all that is needed to address today's environmental problems. But by working in partnership with others, we can make a difference. The sustained efforts of many groups working together have won important advances for the environment, but we need to remain vigilant to defend and build upon these gains in the years ahead.

Since the 1990s, EDF has relied on a series of five-year strategic plans to map out what needs to be done to protect climate, oceans, ecosystems and health. We look at how EDF is best positioned to help meet the most pressing challenges, based on our strengths and the good work others are doing.

Our vision for 2015–2019 is captured in Blueprint 2020, the most ambitious strategic plan that EDF has ever developed, because today's complex challenges require nothing less. Please join us in building a better future.

››› FULL STORY ››› edf.org/blueprint2020

Money down the drain

Water leaks waste billions of gallons of water and countless dollars every year. EDF's Kate Zerrenner explains how smart water meters save you water and money.

edf.org/moneydrain

Blown away by wind power

On a trip to Denmark, EDF membership director Sam Parry reflects on a society racing toward a clean energy future. Can the U.S. emulate Denmark? he asks.

edf.org/windblown

EDF Voices blog

Find out what our experts are talking about. Visit EDF Voices at edf.org/blog.

EDF Action: Opening doors in Congress

CORBIS

Civic and religious leaders, economists and CEOs speak up for the environment on our behalf.

Our political advocacy partner is 100% focused on delivering bipartisan solutions to environmental problems.

In May 2014, the future looked bleak for the nation's best tool to reverse the decline of the oceans. Rep. Steve Southerland (R-FL) had tucked a rider into a must-pass appropriations bill that would have banned new catch share programs in the United States, which have proven to be successful in reviving fisheries. Three years ago, a similar rider had easily passed in the House.

Not this time. In a stunning victory, the U.S. House of Representatives voted 223–185 to defeat the appropriations rider. The turnaround was no accident, but the result of a campaign by EDF Action, the political advocacy partner of Environmental Defense Fund. EDF Action is free to do things that EDF could not do, including unlimited lobbying of Congress, and it does this by raising dollars that are not tax deductible.

Our strategy included cultivating GOP champions, generating positive media coverage and bringing fishermen to Washington to make their case. Perhaps most notable was the conversion by Gulf Coast Republicans—the entire Alabama and Mississippi delegations voted with us. (Rep. Southerland was voted out of office in November.)

This was just one of EDF Action's victories in 2014. For Climate, it helped defeat efforts to undermine EPA's Clean Power Plan and stepped in to defend Republicans in Kansas who were protecting the state's strong renewable energy standards. For Health, it helped advance reform of the nation's chemicals policy. And for Ecosystems, it secured funding for wetlands protection.

Lasting environmental solutions result from having everyone pitch in, regardless of their political views. This has never been truer than today, with the White House and Congress controlled by different parties.

Removing political barriers

"It's critical to depolarize environmental issues," says Elizabeth Thompson, president of EDF Action. "That's why we engage with the political system on both sides of the aisle."

Our Strategic Partners, a network of influential supporters around the country, are helping deliver EDF's message. These allies, including civic and religious leaders and CEOs, contact legislators personally. Calls from Action Fund members turn up the pressure.

"We have our work cut out for us in 2015," says Thompson. "There are sure to be furious attempts to thwart EPA. But it would be a mistake for anyone to conclude that the 2014 election signals that the public wants congressional rollbacks of environmental protections." A recent national poll, for instance, found that seven in ten Americans view climate change as a serious problem and support federal action to cut carbon pollution.

In fact, the election puts new pressure on Congress to find a more constructive approach on the environment.

EDF Action is using cutting-edge analytics to help politicians understand voter attitudes. "Their constituencies are moving—and they've got catching up to do," says Thompson.

"We can't match the lobbyists dollar for dollar," she adds, "but lawmakers listen to their supporters, and many supporters care about the environment. We're helping amplify their voices."

JOHN RAE

"We're on the front lines," says Thompson.

Agriculture: Conservation's new frontier

By Peter Klebnikov

Fertilizer use and soil management are responsible for half of the global warming caused by agriculture.

If we are going to sustainably feed nine billion people in 2050, we must produce more without further contaminating water supplies and disrupting the climate. For EDF, the place to start is fertilizer pollution in the heartland.

In the summer of 2014, a half million residents of Toledo, OH, woke up to find their tap water unfit to drink. The cause? Poisonous cyanobacteria created by excess farm fertilizer polluting Lake Erie and other waters.

With lakes, reservoirs, estuaries and coastal waters around the country registering a rise of fertilizer-driven algae blooms, the same crisis could easily unfold in many American cities.

Traditionally, farmers are careful stewards of the land. But when producing food threatens to deprive us of clean water and a stable climate, it's time to rethink the way we feed America.

"Used inefficiently, fertilizer is a major threat to both clean water and climate," says EDF agriculture sustainability director Suzy Friedman. "Fertilizer not absorbed by the plant is lost to air and water, damaging the environment."

That, in part, is why places like the Gulf of Mexico, Chesapeake Bay and Lake Erie are plagued by huge dead zones.

EDF has partnered with farmers for years to cut fertilizer loss, advancing techniques to improve the rate and timing of nutrients and promoting natural filters such as wetlands to keep fertilizer out of streams. As a result, farms covering half a million acres, mostly in the Midwest, have cut fertilizer loss by an average of 25%—all while maintaining yields.

But with the environmental costs of agriculture rising, EDF is pushing for broader adoption of these practices. The most effective way to do this is to harness every player in the U.S. grain supply chain—from retailer down to the farmer.

First, we helped secure a commitment from Walmart to reduce greenhouse gas emissions from its supply chain by 20 million metric tons by 2015. Fertilizer not absorbed by crops can form nitrous oxide, a greenhouse gas 300 times more powerful than carbon dioxide. Agriculture now contributes 8% of the nation's global warming emissions.

To help meet its goal, Walmart is requiring its biggest food suppliers to create fertilizer efficiency plans for their own supply chains. Several of these food companies, including Smithfield, the world's largest pork producer, Campbell's Soup and General Mills, asked EDF to help them cut fertilizer loss. By 2014, 15 major Walmart suppliers, representing 30% of North American food and beverage sales, began to implement fertilizer efficiency plans.

The Walmart effort will engage the entire supply chain, including the grain buyers and agribusinesses who work directly with farmers on crop management.

Voices from the field

Growing public pressure for sustainable agriculture is helping drive change and gives EDF clout in making conservation an integral part of agriculture.

But to succeed, the initiative requires buy-in on the farm. To help farmers change long-held practices, EDF partnered with United Suppliers (USI), a wholesale agriculture supply company, to create a fertilizer efficiency and soil health program that the company will implement through its owners, who advise grain farmers managing 45 million acres. USI committed to enrolling 10 million acres in the program over the next six years.

"When I heard there was to be a meeting with EDF, I said 'Oh no, this is not

ELENA ESSEERA/ALAMY

BRYON HOULGRAVE

"Efficient fertilizer practices make great business sense," says Iowa grain farmer Bill Couser. "Growers are better off. So is the environment."

going to be good,'" recalls Matt Carstens, USI's vice president. "Instead, EDF reached out a hand and said 'Let's work together.' It quickly became clear that we all want the same thing—to keep fertilizer out of the waterways. So we dropped our weapons."

The focus is on corn, the biggest source of excess fertilizer. Our goal is to maximize fertilizer efficiency on 50% of U.S. corn acres by 2020.

Historically, farmers never knew exactly how much fertilizer to use, so they often applied too much out of fear of losing yield. Friedman and her colleagues put in years visiting farms, getting to know heartland farmers, and consulting with crop associations and other groups. That led to a series of field trials of methods to improve soil health and help farmers apply fertilizer at the right time in the growing season.

"EDF put it all together," says USI's Carstens. "They had the market penetration. They worked on every aspect of the project, from developing the tools to education to accountability. They've been an outstanding partner that's consistently moved the project forward."

Farmers turned out to be willing allies, recognizing that by reducing fertilizer loss, they save money and improve the health of their farm for future generations.

"Our growers are beginning to understand the need to build resilience into natural systems," says Carstens. "With so many floods around the Midwest in recent years, no one knows what is normal anymore."

"Most farmers want to be good stewards," adds EDF's Karen Chapman. "They're open to new ideas once they see the results on their farm."

It's also about the bottom line. Fertilizer accounts for at least half of farmers' input costs, and current techniques generate losses of about 50% of nutrients applied. With better practices, this can drop to as low as 25%.

"There's no doubt in my mind that with this project we'll substantially reduce fertilizer as a pollutant in American agriculture," says Carstens. "At the end of the day, we want to make sure that we in agriculture have done our part to deal with global warming. Our partnership with EDF gives us a platform to do that."

NASA

Massive dead zones in Lake Erie, created in part by fertilizer runoff, appear in light green in this satellite image.

Using the supply chain to bring about change

DEMAND

RETAILERS

establish sustainability standards for the food they sell to consumers

FOOD COMPANIES

set goals for fertilizer efficiency for the grain they buy

GRAIN BUYERS

communicate the demand for sustainable production to agribusiness and farmers from whom they buy grain

AGRIBUSINESS

develops technologies and programs for farmers to improve fertilizer use and soil health, trains crop advisors

FARMERS

adopt practices to improve fertilizer efficiency and soil health, join sustainable grower networks

SUPPLY

Summer jobs: Punching in for the planet

ALAN ENGLISH CPA

From clearing trails to interpreting at parks, summer environmental jobs are plentiful.

REGRETTABLY, FOR MANY COLLEGE students in today's economy, summer means riding the family couch or bottom-level wages at the local fast-food joint. It doesn't have to be this way. Students can find rewarding work and maybe even make a few bucks doing exhilarating, seasonal conservation jobs.

Opportunities for green jobs are growing, but postings tend to follow a pattern—lots of photos of young people bonding, not many details about the work. If you pursue one of these jobs, find out exactly what you'll be doing, where, and under whose supervision. Talk to some recent participants about their experience. And make sure you're clear about the compensation—or lack thereof.

Here are a few of the great opportunities awaiting job seekers:

Wilderness to go

Coolworks.com is an established online gateway to the Maine Conservation Corps, the Canyon Country Youth Corps, and the Adirondack and Appalachian Mountain Clubs, among other great organizations. In the Adirondacks, for instance, student workers fix trails, staff front desks or lead wilderness trips. For perks, there's free use of canoes and kayaks.

This land is your land

The Student Conservation Association (SCA) recruits thousands of college and high school volunteers to work in parks, marine sanctuaries, urban green spaces and other public land across the United States. Jobs vary from environmental educators and citizen science coordinators to exotic plant managers and zookeeping interpreters. Volunteer stints may last from two weeks to as long as a year. Outcomes are encouraging: Twelve percent of the National Park Service's workforce started as SCA volunteers.

Fighting the habitat invaders

If stopping invasive species is your thing, grab that machete! The U.S. Fish and Wildlife Service sends a "strike team" to remote Johnston Atoll in the Pacific to battle "yellow crazy ants," which destroy native plant and bird habitat. In Ontario, the Ministry of Natural Resources has sponsored a "hit squad" to go after giant hogweed, garlic mustard and spiny water fleas in Canadian lakes. New York's Division of Fish, Wildlife and Marine Resources hires students to battle invasive emerald ash borers, which have killed 50 million ash trees in the United States.

Expand your skills

This coming summer the National Park Service is listing thousands of jobs. Sample positions include historic preservation, geological mapping, GIS analysis, architectural research and internships to learn park management.

Save the sharks

The South Florida Student Shark Program, offered for undergraduate and graduate students by the University of Miami's Rosenstiel School, focuses on protecting and improving habitat for Florida sharks. In California, the Monterey Bay Aquarium has a variety of programs for teenagers. And student jobs with the U.S. Fish and Wildlife Service include paid part-time internships through the Congressionally mandated Pathways Program, with a possibility of full-time employment for graduates.

Work at EDF

Environmental Defense Fund offers summer internships in a variety of specialties—from marketing to economic research. Climate and clean air legal internships, open to second-year or higher law school students, assist EDF's legal team in fighting pollution. This summer we anticipate a bumper harvest of work.

Job board

- CoolWorks: coolworks.com
- Monterey Bay Aquarium: bit.ly/11D19lF
- National Parks Service: 1.usa.gov/1uO2q5j
- NY Div. of Fish, Wildlife and Marine: dec.ny.gov/about/634.html
- EDF: edf.org/jobs/internships-fellowships
- NOAA National Marine Sanctuaries: usa.gov/1AtDN10
- Society for Conservation Biology: bit.ly/1xz2BCp
- South Florida Student Shark Program: bit.ly/1zK36Zs
- Student Conservation Association: thesca.org
- U.S. Fish and Wildlife Service: 1.usa.gov/11T0rlk

Members speak out

Your biggest concern? An out-of-control climate

EDF members are a potent voice for climate action. In a recent survey, *Solutions* asked: What should the nation's environmental priorities be in 2015? Here are some of your responses:

■ A global focus on the prevention of catastrophic climate change. After all, a full-scale climate disruption will affect every living creature on the planet, from whales to humans.
—Gene Kroncke, Garwood, NJ

■ Curbing greenhouse gas emissions. Fighting increased reliance on fossil fuels. Promoting clean energy technology.
—Marshall Anderson, Crown Point, IN

■ Installation of solar and wind electricity generation. More public transportation via electric buses and trains. Educating the public about the hazards of global warming.
—Nancy Young, Laguna Woods, CA

PHOTO EDIT

YOUR TOP PRIORITIES

70% Cutting climate pollution

20% Protecting our health from toxic chemicals

10% Promoting clean energy technology

Letters

What's the basis for EDF's calculation that methane is 84 times more potent than CO_2? I'm giving a talk on climate change soon and would like to quote the best data.
—Dr. Alan Peterson, Quarryville, PA

Climate scientist Ilissa Ocko responds: It's important to specify, as we do, that methane is 84 times more potent than carbon dioxide *over a 20-year time period*. This is determined by calculating how much heat methane absorbs during that time, compared with carbon dioxide. Methane dissipates in the atmosphere more rapidly than CO_2, so the longer the time frame, the less impact methane has compared to CO_2. Methane lasts in the atmosphere for at most a couple of decades, while CO_2 can last well over 100 years. The reason we use a 20-year time frame to assess methane's potency is because that's when the gas does the most damage to Earth's climate. Reducing emissions of methane and other short-lived pollutants—while also reducing long-lived pollutants such as carbon dioxide and nitrous oxide—will slow the pace of warming and limit the warming we experience over the next several decades.

Letters may be edited for length and clarity.

STAFF PICKS

Books and movies that inspire EDF staff.

Documentaries

A mission to protect sharks

Shark Girl

As a judge at the Jackson Hole Wildlife Film Festival, EDF scientist Joe Rudek had a definite favorite: *Shark Girl*, the story of a 20-year-old activist who grew up diving with sharks on the Great Barrier Reef. "Madison Stewart is my new hero," he says. "As the father of two girls, I appreciate seeing young women leading a fearless battle against an injustice." **›››WATCH TRAILER ›››** bit.ly/1nofYm5

Great gyres of trash

Plastic Ocean

Another staff favorite is the episode in the *Water Brothers Eco-Adventure TV Series* about the plastic garbage patch in the middle of the Pacific. It's a powerful film for adolescents (and adults) wishing to learn about plastic accumulation in the oceans.
›››WATCH TRAILER ››› bit.ly/11hkOYm

Book

Seeking peace in the natural world

The River Why

"David James Duncan's book is one of those hidden classics that I recommend to everyone I see who likes clean flowing water and fly fishing," says EDF writer Jamie Workman.

What do you recommend?

Share what inspires you as an environmentalist with other members at editor@edf.org.

“The last word in ignorance is the man who says of an animal or plant: ‘What good is it?’”

—Aldo Leopold
Conservationist, philosopher and writer

MARK HAMBLIN/GETTY IMAGES