

Pathways 2025

EDF Strategic Plan





Mission

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.

Table of contents

Introduction: Hope and resilience	2
Leadership	6
Climate	8
Oceans	22
Ecosystems	28
Health	34
Infrastructure	38
Transitions	41
A critical moment	43
Summary of program objectives	44
References	46

Pathways 2025

As we write, the floodwaters are receding, but they have left a permanent mark on the people of the Caribbean, Texas and Florida. Tens of millions in Asia and the Americas are coping with the devastation from historically powerful typhoons and hurricanes. Global climate change helped fuel these storms, yet the President of the United States and the head of the U.S. Environmental Protection Agency (EPA) try to cast doubt on that reality—while surrendering America’s climate leadership and proposing to cripple EPA and demolish public health and environmental safeguards.

That’s a snapshot of our geophysical and political world in late summer 2017, and it hints at some of the reasons Environmental Defense Fund decided to prepare this new strategic plan, *Pathways 2025*, two years ahead of schedule.

Mounting climate urgency, and a U.S. administration that refuses to see it, demand new leadership—an even stronger commitment to clean energy and emissions reduction from China, Europe and others; from companies and institutions; and from cities, states and citizens. Fortunately, in response to the new federal assault on clean air, clean water and ecosystem protections, we are also seeing an extraordinary upwelling of public support for core environmental values. We must work together to meet this critical moment.

Since 2014, when we published our last plan, *Blueprint 2020*, several other developments have also prompted a full rethink of our strategy. The Paris climate agreement established new global ambitions that will require tremendous effort to achieve. The United Kingdom’s vote to leave the European Union, like the 2016 U.S. election, has deep implications for our work. And as more governments and nonprofit groups around the world ask EDF to consult on their challenges—and the solutions to those challenges require international approaches—our work continues to become more global.



Carl Ferenbach, Fred Krupp and Diane Regas

The most important development may be the wave of technological innovation that is empowering communities to take action—and driving a revolution in environmental protection. You’ll see examples throughout *Pathways 2025*.

Many paths can take us where we need to go, and no group can do all that’s needed. So we assessed the facts on the ground, identified allies and looked at how EDF is best positioned to help. We charted our paths to 2025 and beyond, setting five-year milestones for 2022 to measure progress and hold ourselves accountable. (For climate and air pollution, we set milestones for 2025 to align with some countries’ commitments in the Paris Agreement.)

Working together, we can move to stabilize the global climate, build defenses against extreme weather, ensure food security and abundant oceans, and reduce exposure to air pollution and toxic chemicals. In these pages, we share that vision and introduce a few of the people who will help make this plan a reality. Please join us in creating a better future.


Carl Ferenbach
Chairman


Fred Krupp
President


Diane Regas
Executive Director

Hope and resilience



In 1963, there were fewer than 500 nesting pairs of bald eagles in the United States. The pesticide DDT was thinning the birds' eggshells, causing the number of chicks to plummet. After EDF helped win a U.S. ban on DDT in 1972, the bald eagle rebounded. In 2007, with some 10,000 nesting pairs, the iconic bird came off the endangered species list.¹ We're proud that today the U.S. Fish and Wildlife Service estimates there are 143,000 adult bald eagles in the United States.

The United States has made tremendous environmental progress over the past 50 years. The air most of us breathe is cleaner than it has been in decades, and the acid rain that once fell on our lakes and forests has been dramatically reduced.² Magnificent, once-endangered birds like the bald eagle and osprey are thriving.³ And dozens of fish species—Gulf red snapper and grouper, Pacific halibut and rockfish—are on the rebound as well.⁴

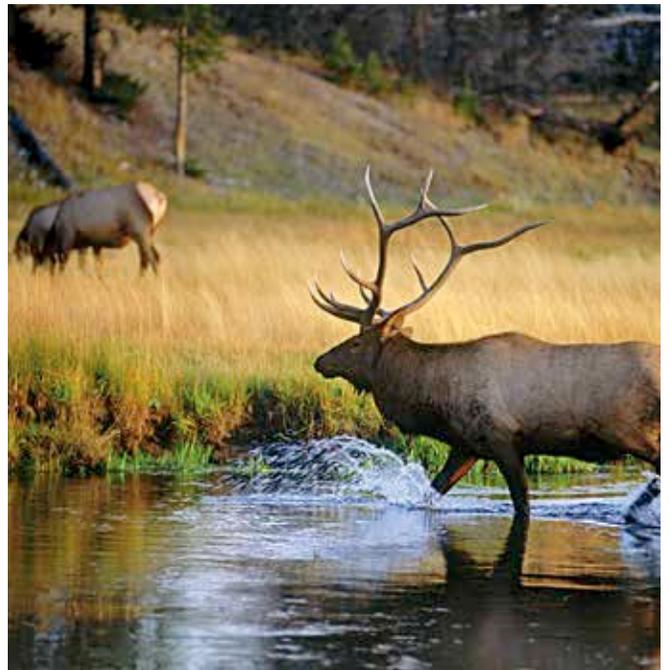
Environmental Defense Fund is proud to have played a central role in achieving these hard-won goals. And we're pleased and grateful that leaders in Europe, Asia and the Americas are increasingly drawing on our expertise to help solve their most pressing environmental challenges.

But there is still so much to be done. More than 125 million Americans live in places with unhealthy air.⁵

Thousands of U.S. communities are plagued by lead poisoning.⁶ And the environmental gains of the recent past are at risk as the Trump administration does all it can to roll back climate action and dismantle the bipartisan protections that helped deliver that progress.

The latest science deepens our understanding of climate risk, and underscores the urgent need to rapidly reduce greenhouse gas emissions. And peoples' everyday experience—more lethal heat, more destructive wildfires, more powerful storms—commands us all to see that we're in the race of our lives.⁷ So EDF is helping to rally the millions of women and men who agree that environmental values are core human values.

Our work is grounded in the rigor of the scientific method and the insights of economics, and it is also infused with



Hope and resilience

hope. We know that our solutions, if scaled in time, can help turn the corner to a safer climate, cleaner air and healthier communities. Our commitment to measurable outcomes can be seen in our work to build resilience in the face of climate change. It's not a glib assurance that people and nature can magically adapt, but a realistic assessment of how we can help communities and ecosystems survive and even thrive.

The well-being of people and nature rests upon a web of interconnections among EDF's four focus areas: Climate, Oceans, Ecosystems and Health. Well-managed ocean fisheries, for example, are better able to withstand the stress of climate change—and the futures of people everywhere depend on healthy oceans.⁸ In turn, the climate will benefit from our Health program's work to reduce conventional air pollution (see p. 37), as well as from our Ecosystems work to reduce overuse of fertilizer, which means less of the powerful greenhouse gas, nitrous oxide, entering the atmosphere (see p. 33). And building natural infrastructure—wetlands, barrier islands, oyster reefs—helps make coastal communities more secure (see p. 30).

In the coming years, EDF will concentrate on strategies that drive progress despite the current roadblocks in Washington, DC. Our 11-year partnership

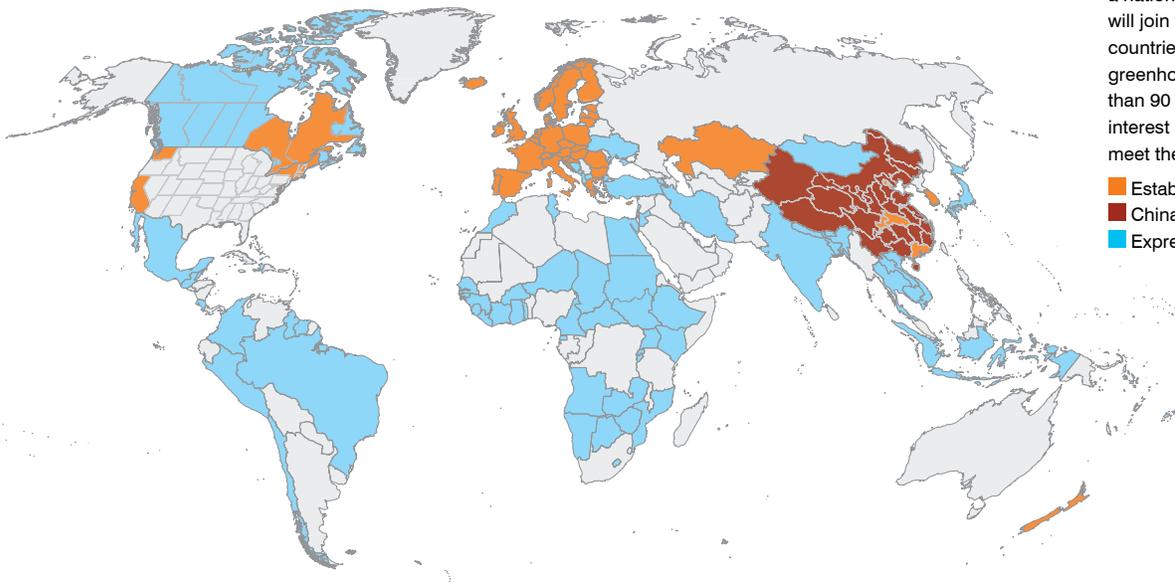


TWO DECADES IN CHINA

“EDF has gained a strong reputation and breadth of experience in protecting China's environment.”

Dr. Zhang Jianyu
China Managing Director

Markets put a price on emissions



With the gradual expansion of its carbon trading pilot programs to a national carbon market, China will join the growing number of countries using markets to cut greenhouse gas emissions. More than 90 countries have expressed interest in using markets to help meet their Paris emission targets.

with Walmart helped inspire the world's largest retailer to commit to reducing one billion tons of carbon pollution from its operations and global supply chain by 2030—an amount greater than the annual emissions of Germany. And during more than 20 years of work in China, we have trained 39,000 environmental enforcement officers, championed tougher laws and offered assistance to the government as it rolled out seven pilot emissions trading programs to address carbon pollution.⁹ These pilots gave China the confidence to begin phasing in a national emissions trading system for carbon in 2017. We'll work closely with the Chinese to ensure the success of this critical piece of global climate leadership (*see p. 12*).

Similarly, EDF's work to rebuild fisheries is having a profound global impact. In the United States, fish populations are rebounding and fishermen are better off.¹⁰ We have supported similar progress in Mexico, Belize, Sweden and the Philippines. Now we're scaling this work with a goal of reducing global overfishing 30% by 2025, in order to boost fish in the sea 50% by 2030 and improve the well-being of 400 million vulnerable people worldwide (*see p. 22*).

EDF is known for building unexpected partnerships. Many elected officials and other decision makers had never seen such inclusive environmental coalition-building until we walked through their doors alongside fishermen, ranchers, corporate leaders and other unlikely allies. It makes for powerful first impressions—and durable solutions. Tens of thousands of consumer products are now safer because we partnered with Walmart and other retailers to remove chemicals of concern from them. We also supported a bipartisan coalition that passed landmark U.S. chemical safety legislation in 2016; now we're fighting for effective implementation of those critical reforms (*see p. 36*).

On all of our issues, we apply the tools of science and economics, political acumen and technological innovation—harnessing the power of markets to drive environmental good. We call it finding the ways that work. It's the model you'll see throughout this plan, and together with your support, it's what gives us hope that we can build a resilient future where people and nature prosper.

SPOTLIGHT ON

Diversity



PROGRESS FOR ALL

“The communities harmed most by pollution are underrepresented in the environmental movement. This needs to change.”

Ana Lucia Garcia Briones

Senior Specialist, California Groundwater,
and Co-chair, EDF Diversity Committee

In the United States and around the world, EDF seeks to serve diverse communities, including the most vulnerable. We want everyone to enjoy environmental and economic well-being. Here are a few of our recent initiatives:

- Collaborating with 22 other national organizations after the Flint lead-poisoning crisis to accelerate replacement of the lead pipes that supply drinking water to up to ten million American homes.
- Working with Latino and low-income communities in California's Central Valley to improve water resource management.
- Helping rural communities in North Carolina gain access to clean energy.
- Training fishermen from marginalized communities in Belize to take on leading roles in the management of their fisheries.

Leadership



Sen. Lamar Alexander (R-TN) with national field manager Trisha Sheehan of our Moms Clean Air Force affiliate and her son Lincoln

Activating an environmental majority in America

Though EDF's focus is increasingly global, there is one area—political engagement—where our expertise and strategic emphasis continue to center on the United States, whose policies have global impact. EDF's work with policymakers and EDF Action's grassroots efforts will allow us to build a bench of environmental champions among both Republican and Democratic officials and to inspire a large, bipartisan majority of American voters to stand up for the bedrock value of environmental progress.

EDF Action, the U.S. political arm of Environmental Defense Fund, can freely lobby Congress and state legislatures thanks to the flexibility of donor support that is not tax-deductible.

The early months of the Trump administration saw a moment of genuine rebirth for the political salience of environmental issues—and a historic upwelling of support for our efforts. Hundreds of thousands took to the streets of Washington in the name of climate action and sound science. Donations to EDF and other organizations have set records. Polls show President Trump's environmental agenda is deeply unpopular.

EDF's vision At the federal level, our vision is of a Congress and administration in which members view undercutting environmental standards as carrying the same political risk as cutting Social Security. We seek to revive serious consideration of environmentally sound, market-based policy reforms for endangered species, climate, health and oceans.

At the state level, our vision is to have states leading the way on EDF's priorities when and where possible. State action played a crucial role in building pressure for toxic chemical policy reform, and places like Nevada and North Carolina are showing what is possible for clean energy outside traditionally progressive states. But there are dangers. State action in Oklahoma was the breeding ground for current EPA administrator Scott Pruitt, and organizations like the American Legislative Exchange Council (ALEC), funded by vested interests, have used state legislatures to set back our policy priorities.

Theory of change We believe that by engaging actively in the policymaking process, we can help build a durable and inclusive environmental majority in the United States. Since issues like clean air and water resonate strongly across the political spectrum, we have the chance to make our priorities relevant to members of Congress and other policymakers. They should view

politically active environmental organizations as fully equal to other powerful constituency groups in the United States.

The Trump administration has clearly set back our timeline on major issues. But the administration's extremism has also revealed deep public support for our positions, laying the groundwork for renewed political power. To turn this opportunity into a positive new chapter for environmental politics in America, we must use the tools we have built over the last few years: an EDF membership list of more than two million; our Moms Clean Air Force affiliate, with more than a million members; Defend Our Future, a burgeoning initiative to engage millennials; growing outreach to Latinos and conservatives; a multistate field program; and a powerful digital and earned media program that supports and amplifies all of these efforts.

In this moment of great peril, we are well positioned to take advantage of an energized citizenry to defend our environment, speak up for a world where people and nature prosper, and emerge strengthened for future progress.

OBJECTIVES FOR 2022

- Solutions are in place at the federal and state level that drive down greenhouse gas emissions, as a result of significant political support from people across the U.S. political spectrum.
- At the federal level and in targeted states, a diverse pro-environment majority supports environmental safeguards and protections for public health, supplying political power when needed to move forward on policies at either the executive or legislative level.
- There is a political cost to trying to tear down public health protections.
- A bench of new environmental champions has been elected in key states and at the federal level.

Some of our partners: American Security Project, Citizens' Climate Lobby, Congressional Hispanic Caucus Institute, Interfaith Power and Light, League of Conservation Voters, League of United Latin American Citizens, Niskanen Center, Natural Resources Defense Council, Truman National Security Project, Young Conservatives for Energy Reform.¹¹

SPOTLIGHT ON

Communications



THE VOICE OF REASON

“Persuasive communications are at the core of our work. Inspiring others to support and adopt great ideas helps turn them into reality.”

Eric Pooley

Senior Vice President,
Strategy and Communications

As EDF program leaders formulated the strategies described in these pages, our communications experts began working to help achieve them. An increasingly global team of specialists in media relations, digital marketing, content production and member engagement helps us cut through the noise and build support for our solutions with the public, policymakers and a broad range of stakeholders.

We don't try to be the loudest voice in the room. As befits an organization founded by scientists, our tone is respectful, judicious and evidence-based. While some reject the idea that objective facts and analysis can change the world, EDF remains dedicated to reasoned, yet passionate, public debate and persuasion. That's who we are.

Climate



FORGING THE PATH

“Realistic actions in the most important countries and economic sectors can put us on the road to climate stability.”

Gwen Ruta

Senior Vice President, Climate and Energy

Our vision of the future

As wildfires, floods and storms become ever more intense and damaging, our sense of climate urgency keeps rising. Yet we can still see what is possible. 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 ... where homes not only run on clean electricity but also generate, store and sell it ... and where people around the world enjoy the benefits of a stable climate and a prosperous low-carbon economy.

EDF has such a vision. To get there, we need to act fast, but our actions must be informed by the long view. To stabilize the climate, we must eventually stop putting more greenhouse gases into the atmosphere than we take out through reforestation, agricultural practices that increase carbon in soils, and carbon-capture technologies that may emerge in years to come. This point of balance is called “net-zero emissions.” To reach this long-term goal, we must keep open options that allow for ambitious action both today and into the future. This strategic plan lays out actions in a few key countries and economic sectors that have the greatest impact on our ability to reach climate stability and where EDF is best positioned to successfully drive measurable and significant change.

Our strategies are designed to address long-lived climate pollutants—carbon dioxide from fossil fuel combustion and deforestation, as well as nitrous oxide from agriculture—that warm the atmosphere for a century or more. They also address emissions of potent, short-lived climate pollutants such as methane. Reducing short-lived pollutants will lessen the risks from extreme weather and sea level rise for people and ecosystems alike and help forestall dangerous climate tipping points that can accelerate warming over the coming centuries.

Energy, transportation, land use: these are the building blocks of economies around the world. Changes to business as usual in these sectors can have far-reaching impacts. By leveraging market forces through well-designed policies and private-sector action, our plan links climate progress in strategically important parts of the globe to politically potent local goals for poverty alleviation, health, jobs and economic growth.

Even with ambitious emissions reductions, considerable warming is inevitable. EDF’s Oceans, Ecosystems and Health programs (see later in this plan) are all pursuing initiatives that will help people and natural systems build resilience and, to the extent possible, adapt to change that we cannot avoid.

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

The Honorable George P. Shultz
Former U.S. Secretary of State



FROM A POLLUTION-CHOKED WORLD . . .



. . . TO ONE OF CLEAR BLUE SKIES . . .



. . . RAINFORESTS WORTH MORE ALIVE THAN DEAD . . .



. . . AND COMMUNITIES POWERED BY CLEAN ENERGY.

EDF’s climate vision

Stabilize the climate by dramatically reducing emissions of climate pollutants, to the point where emissions are balanced by actions that remove carbon dioxide (CO₂) from the atmosphere. Help people and ecosystems build resilience and adapt to the warming that does occur.

2025 goal

Ensure that CO₂ emissions start declining rapidly beyond 2020, while significantly reducing methane emissions to slow the rate of warming.

Theory of change

By focusing on the largest and best opportunities, we can make the most progress. EDF will work in targeted countries and sectors to help design markets and policies that align national priorities with greenhouse gas reduction, turning the engines of prosperity toward a stable climate.

Turning the corner toward a safe and stable climate

Until recently, greenhouse gas emissions have been increasing since the Industrial Revolution, with only brief respites during times of global economic stress. But for three straight years starting in 2014, global CO₂ emissions from energy held steady in a period of economic growth. Although 2017 is projected to see a rise in global emissions, many countries show strong evidence that growth has been decoupled from pollution, and the world could soon reach a permanent inflection point—turning the corner from rising to falling global emissions.

Why? Worldwide dependence on coal has declined.¹² Adoption of renewable energy is at an all-time high, costs of wind and solar have plummeted and a new spirit of global climate ambition has taken hold, embodied by the Paris Agreement. Even in the United States—where the Trump administration’s opposition to climate action is an obvious impediment—states, cities and businesses are taking action to reduce emissions and pave the way for renewed U.S. leadership on climate.¹³

This progress is cause for celebration. Yet turning the corner on CO₂ emissions will be just a first step toward the steeper emissions reductions needed for a stable climate. There are many pathways—combinations of investments, technologies and policies—that can get us there. This strategic plan is designed to keep as many paths open as possible, by achieving near-term reductions while avoiding investments that could lock in high emissions in the future for regions and sectors poised for growth.

In the long term, to reduce the impacts of climate change we need to not only reduce emissions dramatically, but also take CO₂ out of the atmosphere through increased storage in natural systems and potentially through other means. For example, EDF’s Ecosystems program already is working with farmers to deploy agricultural techniques that improve fertilizer efficiency and increase the carbon stored in soils (see p. 33).

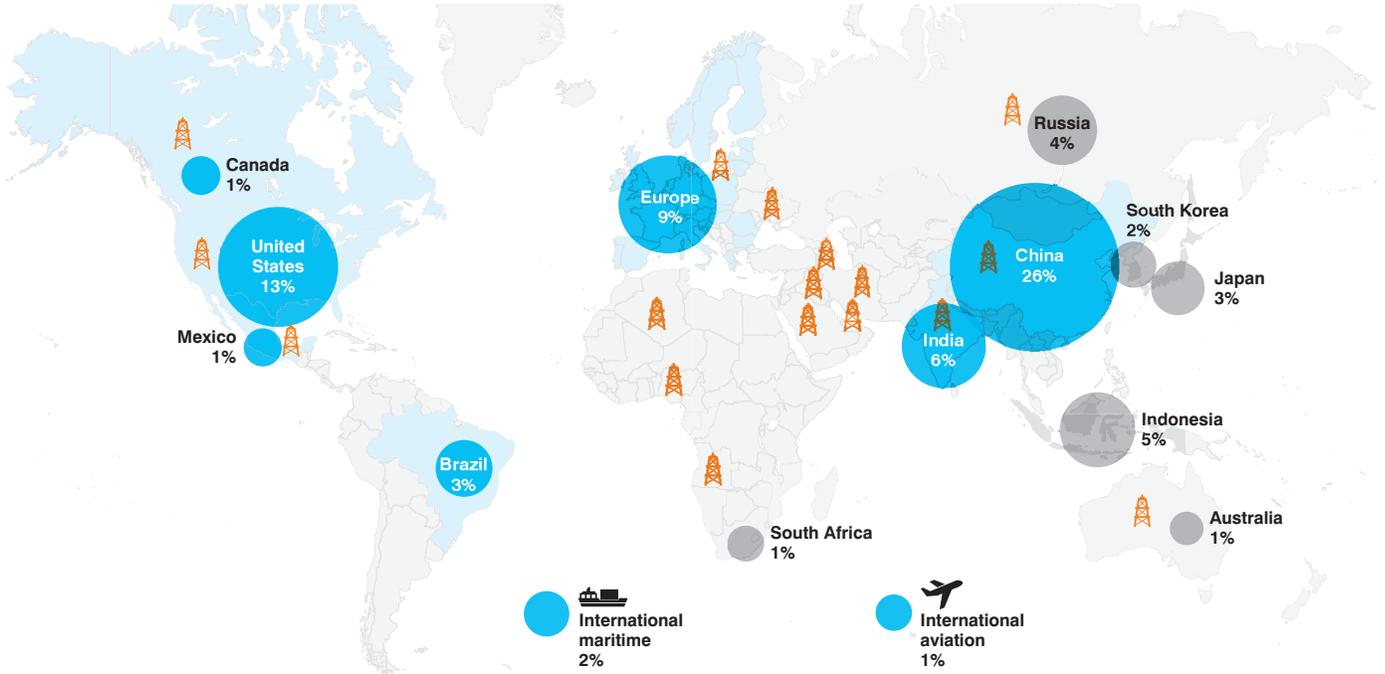
Methane We must also do more to reduce emissions of other greenhouse gases, notably methane, that have continued to increase. Human-caused methane emissions account for around a quarter of the warming that we are experiencing today. Methane is many times more powerful than CO₂, although it does not last nearly as long. Cutting emissions of both pollutants simultaneously is essential to reducing the rate and degree of climate change. The biggest immediate opportunity to cut methane is in the global oil and natural gas supply chain.

Countries where EDF is working It’s clear where to focus our attention. For CO₂, the 15 largest emitting jurisdictions account for around 80% of current and projected emissions, with the top three alone—the United States, China and Europe—accounting for nearly half the world’s total.¹⁴ Top emitters of oil and gas methane include North America, Europe and the Middle East. Indonesia and the Amazon have the bulk of tropical deforestation. EDF is positioned to accelerate reductions of CO₂ and methane in many of these top-emitting areas, particularly China, North America, Europe and the Amazon.

Emerging areas Taking the long view, we must also pave the way for action in places and sectors that will become more important as emissions go down elsewhere. India stands out, since by 2040 it has the potential to become the second-largest emitter of CO₂, after China.¹⁵ China’s Belt and Road initiative, involving 68 other countries, is another opportunity to spur low-carbon growth.¹⁶

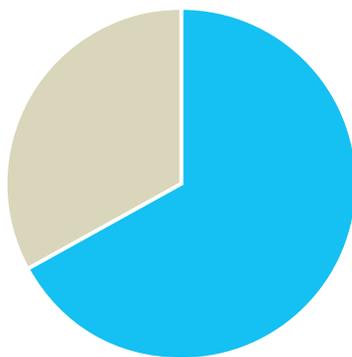
As electricity gets cleaner, transportation will become a larger part of the emissions problem. But it will also become easier to address, because once we have low-carbon electricity, shifting from petroleum to new transportation technologies such as electric vehicles will help drive down total greenhouse gas emissions.¹⁷

A large portion of emissions comes from the top emitters



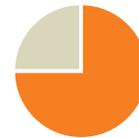
The area of the circles is proportional to annual CO₂ emissions from each of the 15 largest emitters, which account for more than three-fourths of the global total. The blue circles show where EDF will focus on CO₂, while the orange icons show where we will focus on methane emissions from the oil and gas industry.

EDF is focusing its work for maximum impact



EDF Focus
2/3 of total

Annual CO₂ emissions from all countries and sectors
(Total 39 billion metric tons of CO₂)



EDF Focus
3/4 of total

Annual methane emissions from oil and gas sector
(Climate impacts over 20 years equivalent to emitting 6 billion metric tons of CO₂)

EDF is focused on a handful of places and sectors responsible for two-thirds of annual global CO₂ emissions (blue circles on map) and will be working directly or with partner companies in countries accounting for three-quarters of annual methane emissions from the oil and gas sector (orange icons on map).

CO₂ estimates include emissions from fossil fuel combustion, industrial processes (e.g., cement production), tropical deforestation and forest degradation, and peatland drainage and burning. Does not include gross emissions from forest loss outside the tropics (about 3 billion metric tons annually). See endnote for sources and details.¹⁸

Critical regions and sectors

China

China has stepped up its climate leadership dramatically in recent years. The nation's leaders are combating the twin dangers of air pollution and climate change by increasing clean energy capacity and moving toward a national cap on carbon emissions. EDF has been working for two decades to help build China's capacity and ambition.

Now China is set to begin phasing in a national emissions trading system (ETS) for carbon, expected to be the largest in the world. By 2020, it will manage roughly half of China's 10.4 billion metric tons of CO₂ emissions and help meet national goals for included industries. At the same time, the government is reducing air pollution and pushing ahead with its Belt and Road initiative, a massive economic development project driving investment and climate impacts in China and 68 other countries that are its trading partners.

The carbon market China's national ETS for carbon will be a huge step toward achieving our most important objective there: seeing China's total carbon emissions peak by 2025, five years ahead of the country's commitment under the Paris Agreement. A crucial part of accomplishing that will be to have the ETS working well by 2020. EDF provides robust technical support to the Chinese government in areas such as system design, data quality, third-party verification, training and enforcement, which represent critical preconditions to realizing China's ambitions for the ETS. Capping CO₂ emissions from major industrial sources is also a key part of this, and precisely at what level the cap

KEY EFFORTS OUTSIDE EDF

Advance low-carbon urban design so China's new cities have a reduced carbon footprint (e.g., *Energy Foundation China*)

Conduct citizen outreach on practical measures people can take to reduce greenhouse gas emissions (e.g., *WWF China*)

Mobilize prominent Chinese business leaders to make philanthropic investments to reduce desertification and sequester carbon (e.g., *Society of Entrepreneurs and Ecology*)

Throughout this plan, we take note of a cross section of ongoing efforts that complement EDF's work, giving one example of a group engaged in each area. It would be impossible to mention all the groups doing equally important work.¹⁹



Environmental Defense Fund President Fred Krupp meets with Chinese leader Li Keqiang in Beijing at the 2015 Global Think Tank Summit. EDF has served as an adviser to the Chinese government for more than 20 years.

will be set remains a critical open question. Given the momentum generated in the past several years, we are optimistic about reaching the peak by 2025, but much work lies ahead.

Air pollution Another key goal is to build a strong linkage between progress on carbon emissions and reduction of conventional pollutants. Integration of policies to improve air quality with those that curb climate pollution will help demonstrate that progress on each furthers the other, locking in the sense that greater ambition is in China's self-interest. Since many national agencies and local governments oversee air pollution and carbon pollution, our goal will be to help harmonize their policies while securing the government's target of a 40% cut in fine particulate matter (PM 2.5) in the Beijing-Tianjin area by 2020.

Low-carbon investment China's Belt and Road initiative aims to invest over \$1 trillion in infrastructure projects spanning 69 countries, including China, that make up more than 60% of global CO₂ emissions. Linking China with markets in Central, Southeast and South Asia, Africa and Eastern Europe, it represents an opportunity to spur low-carbon growth on a global scale. China has signed agreements on energy, infrastructure and industrial development with more than 30 countries in the region. To ensure the initiative does not shift China's emissions to its neighbors, we will help foster conditions that identify, manage and mitigate environmental impacts while promoting pathways for companies and development banks to make climate-friendly investments. We will leverage our Green Supply Chain Initiative, which is included in China's 13th five-year plan and provides Chinese companies with incentives to improve energy efficiency and control emissions. Our goal is to encourage investments, policies and engagement that spur low-carbon development in the region.

OBJECTIVES FOR 2025

- Carbon emissions from major industrial sources are capped, and China's total carbon emissions peak by 2025, five years ahead of China's Paris Agreement target.
- Air quality improves across the country, including a 40% reduction from 2013 levels of fine particulate matter (PM 2.5) in the Beijing-Tianjin area by 2020.
- China is spearheading low-carbon development in the Belt and Road countries, by expanding its carbon market to those nations.

Some of our partners: Bureau of Environmental Supervision, Ministry of Environmental Protection; China Association for NGO Cooperation; China Council for International Cooperation for Environment and Development; China Electricity Council; Chinese Academy of Agricultural Sciences; Climate Department, National Development and Reform Commission; Policy Research Center for Environment and Economy; Poverty Alleviation Office, State Council; School of Law, Peking University; School of Public Policy and Management, Tsinghua University; local Environmental Protection Bureaus.²⁰

SPOTLIGHT ON

Economics



GUIDING THE INVISIBLE HAND

“Market forces can drive either pollution or progress, so EDF works to harness their power for good.”

Dr. Frank Convery
Chief Economist

As Adam Smith said, “Man is an animal that makes bargains; one dog does not change bones with another dog.” EDF draws on this uniquely human impulse in ways that protect our environment: designing markets that have the right incentives in place to reward people for conservation and stewardship. Smart rules help ensure a world where people and nature prosper together.

This insight shapes our work, from the 1990s-era federal cap-and-trade program that helped put the acid rain pollution crisis behind us, to systems that are reducing carbon today in jurisdictions around the world. It helped Gulf red snapper fishermen see their annual catch more than double while prices at the dock rose and costs fell.



THE IMPACT OF INNOVATION

“Clean energy is winning out over coal in the electricity marketplace for the first time in history and creating millions of jobs in the United States—that’s a game changer.”

Jim Marston

Vice President, U.S. Climate and Energy

KEY EFFORTS OUTSIDE EDF

Ensure access to safe, reliable and affordable energy for all communities (e.g., *The Greenlining Institute*)

Promote the connections among climate change, national security and clean energy (e.g., *American Security Project*)

Mobilize grassroots activists to retire old coal plants and oppose new ones (e.g., *Bloomberg Philanthropies’ partnership with Sierra Club*)

Engage disadvantaged youth in national service for the environment (e.g., *Green City Force*)²¹

North America

While current prospects for federal action in the United States are dim, cities, states, corporations and citizens across the country are taking on the climate challenge as never before. Canada and Mexico are also moving forward. Our strategy in North America is to work with these newly energized constituencies to make important progress now to reduce carbon pollution, while positioning ourselves to move quickly and boldly when federal opportunities re-emerge.

Accelerating the deployment of clean energy There is huge potential to expand U.S. generation of clean, low-carbon energy, but to unleash it we must transform our century-old electricity system. Policies that impede the growth of rooftop solar or subsidize dirty coal-fired generation must be eliminated.²² EDF is advocating market rules that reward efficiency, maximize renewables, minimize dependence on natural gas, empower consumers and transform the aging electric grid into an intelligent network.²³ In particular, modernizing the grid will allow it to carry a maximum amount of intermittent solar and wind power by utilizing energy storage and real-time demand management. We are focusing on innovations in seven states—California, Illinois, New Jersey, New York, North Carolina, Ohio and Texas—that will create powerful models for boosting renewable energy and efficiency nationwide.²⁴

Methane emissions: Protecting our climate and communities now

North America accounts for nearly 20% of all methane emissions from the global oil and gas industry.²⁵ More than 34 peer-reviewed studies coordinated



In a bipartisan victory, Illinois recently passed the Future Energy Jobs Act to cut pollution and help people save money on their electric bills. The new law will spur an estimated \$12–\$15 billion in private investment and create tens of thousands of new jobs, while boosting solar and wind power and cutting greenhouse gas emissions from the power sector nearly 56% by 2030.²⁶

by EDF in recent years have brought the magnitude of this problem into focus. Although reducing dependence on oil and gas may be the surest way to reduce oil and gas methane pollution, such efforts may take decades to achieve. (Roughly two-thirds of U.S. natural gas is used not for power generation but as a feedstock for chemicals and fertilizer, and for direct heating and cooling.)

Meanwhile, unabated methane emissions drive our global climate toward dangerous tipping points. So we must do all we can to minimize the industry's impact on our climate, air and water now, even as we accelerate the important work of developing clean low-carbon alternatives.

In the United States, EDF's priority is defending the progress we have made at the federal level over the past five years, while continuing to advance new rules in key oil and gas states, such as Pennsylvania, Ohio, New Mexico and California. In Canada and Mexico, we are working toward the adoption of rules consistent with our global goal of a 45% reduction in oil and gas methane emissions by 2025.²⁷ We continue to partner with industry and technology entrepreneurs to find ever-cheaper, effective ways to detect, quantify and reduce methane emissions and other environmental and health hazards.

Expanding carbon markets California, currently the world's sixth-largest economy, has expanded its statewide cap-and-trade system to include transportation fuels, linked it to similar markets in Quebec and Ontario, and extended it to 2030 with the aim of cutting greenhouse gas emissions 40% by then.²⁸ In the Northeast, the Regional Greenhouse Gas Initiative caps emissions from the power sector in nine states. Our plan is to seek similar opportunities around the country (candidates include Oregon, Washington, Minnesota and Colorado). And we will leverage California's leadership to catalyze the development of carbon markets elsewhere in the Americas—starting with Mexico, where we and our partners are working directly with the government to develop an emissions trading system.

OBJECTIVES FOR 2025

- The United States has achieved a 26% to 28% reduction in greenhouse gas emissions (from a 2005 baseline).
- North America has reduced methane emissions from the oil and gas sector consistent with a 45% reduction in global methane emissions from that sector.

Some of our partners: BlueGreen Alliance, Citizens Utility Board, Clean Air Task Force, Climate Action Campaign, EarthJustice, Gridwise Alliance, Institute for Policy Integrity, Natural Resources Defense Council, The Nature Conservancy, Ohio Environmental Council, Pembina Institute, Pennsylvania Environmental Council, Stanford Precourt Institute for Energy, Union of Concerned Scientists, Western Resource Advocates, The Wilderness Society, Wyoming Outdoor Council.²⁹

SPOTLIGHT ON

Law



LEGAL ACTION

“Now more than ever, well-designed, effectively implemented and actively enforced environmental laws are essential.”

Vickie Patton
General Counsel

In this political era, the rule of law is providing essential accountability. EDF is taking strong legal action to defend bedrock U.S. environmental safeguards and to build a legal bulwark around states' ability to drive bold near-term progress.

We are joining forces with state attorneys general, public health groups and environmental allies, just as we did in 2007, when the Supreme Court ruled in two landmark cases that EPA had legal responsibility to limit greenhouse gases and enforce modern air pollution controls for aging coal plants.

We are also going on offense and developing innovations in law to secure lasting health and environmental gains—no matter who is in the White House.



A TWO-WAY STREET

“We face common challenges around the world, so increasing the flow of ideas between nations increases our ability to take effective action.”

Baroness Bryony Worthington
Executive Director,
Environmental Defense Fund Europe

KEY EFFORTS OUTSIDE EDF

Expose the tension between company investments in fossil fuels and Paris climate targets (e.g., *Carbon Tracker*)

Apply artificial intelligence to reduce power usage in data centers and elsewhere (e.g., *DeepMind*)

Decarbonize road transport policy in Germany (e.g., *Agora Verkehrswende*)

Set pollution limits for smokestacks (e.g., *European Environmental Bureau*)³⁰

Europe

Europe has long been a climate leader. At home, carbon emissions have fallen even as the region’s economy grows. Internationally, European diplomatic efforts helped secure the Paris climate agreement in 2015, and Europe’s early actions have spurred steep cost reductions in clean energy technologies.

Building on this momentum, Environmental Defense Fund Europe will reach out to new audiences and deploy innovative approaches that add value to an already powerful movement. We aim to achieve impact in three major areas:

Energy sector transitions Europe envisions a future of greater energy efficiency and zero-carbon electricity. We will help speed the way to that future by collaborating with other nonprofits, investors, technology companies and policy entrepreneurs to accelerate investment and policy innovation. Building on our successful Investor Confidence Project, which streamlines energy efficiency transactions and increases the reliability of projected energy savings, we will help realize the €60bn—€100bn/year European market for such investments that will be needed to meet Europe’s climate goals.

Carbon pricing The EU Emissions Trading Scheme (EU-ETS) is the world’s largest carbon market. EDF Europe will help ensure that the region stays on course with ambitious, yet pragmatic, climate policies. For example, we will explore the benefits of market-based approaches in sectors not currently covered by the trading program, such as international shipping, helping to build confidence that current overall targets can be not only met but exceeded.

Methane Europe consumes 11% of global natural gas and is home to four of the world’s six integrated “supermajors” in the oil and gas industry. This creates a unique opportunity to reduce harmful methane leakage from the natural gas supply chain, both within Europe and by leveraging global industry practices. With our partners, we have launched a series of international methane studies to gather better emissions data and are also undertaking targeted advocacy to spur action to reduce emissions.

OBJECTIVES FOR 2025

- Europe has increased its commitment under the Paris Agreement, pledging to cut emissions more than the originally promised 40% by 2030 (from a 1990 baseline).
- Carbon pricing is effective in reducing emissions across all sectors, including through the EU-ETS and through ICAO and IMO for international aviation and shipping.
- European countries and companies have made strong commitments to reduce methane emissions, consistent with achieving a 45% global reduction by 2025.
- Accelerated adoption of clean energy in all sectors has reduced carbon emissions (against a 2017 baseline) while allowing for strong growth in the economy.

Some of our partners: Clean Shipping Coalition, Green Business Certification Inc., International Emissions Trading Association, Oil and Gas Climate Initiative, Principles for Responsible Investment, Sandbag Climate Campaign.³¹

India

India's challenge is to modernize its economy and lift hundreds of millions of its citizens out of poverty while avoiding the high carbon emissions that have fueled growth elsewhere. By 2050, India could become the world's second-largest economy, ahead of the United States.³² Depending on its future energy mix, growth could make India the second-largest emitter of CO₂, after China.³³

Any effort in India to address climate change must deliver progress toward development goals such as poverty alleviation and improved health. Ten of the world's most polluted cities are in India, and air pollution claims one life every 18 seconds—an economic cost equivalent to 7.7% of GDP.³⁴

Renewable energy generation doubled between 2014 and 2017, and the government aims to triple that again by 2022. Many organizations are working on accelerating renewable energy deployment and clean energy access. To help build on these efforts and deliver on the promise of cleaner air and lower carbon emissions, EDF will collaborate with Indian organizations to identify major sources of air pollution and help build a data-driven, market-based system for managing them. Holding factories and power plants accountable for pollution will make the price of fossil fuels reflect the true cost to society. Ultimately, a rigorous system will drive reductions in both conventional and climate pollutants, improve health, reward clean investment and put India on a path to a low-carbon economy.

Given the risks and complexities of working in the world's largest democracy, we will work closely with Indian partners and must be deliberate in our approach. We plan to begin with state-level programs to demonstrate solutions that can be scaled up over time. Because this is an India-led strategy, we anticipate only a small in-country staff.

The vast rural sector is also central to climate strategy and poverty alleviation.³⁵ EDF has worked with the government and nonprofit groups on rural low-carbon development since 2009. The solutions being implemented, from clean stoves to climate-smart farming techniques, improve quality of life while reducing emissions, showing that climate action can be aligned with inclusive growth.

OBJECTIVES FOR 2025

- Be on track to achieve compliance with National Ambient Air Quality Standards for conventional pollutants by 2030, while building capacity to address climate pollution.
- A low-carbon rural development policy is established, with solutions including clean biogas stoves and low-carbon farming techniques adopted by ten million households in six states and an established pathway to national coverage.

Some of our partners: Climate Parliament, The Energy and Resources Institute, Fair Climate Network, Farms n Farmers Foundation, IndiGo Airlines, NITI Aayog, Public Health Foundation of India, UrbanEmissions.info.³⁶



IMPROVING QUALITY OF LIFE

“Our partners in India have reached more than a quarter-million poor rural families through low-carbon pilot programs.”

Richie Ahuja

South Asia Regional Director for Climate

KEY EFFORTS OUTSIDE EDF

Improve air quality by reducing emissions in the transportation, utility and refuse sectors (e.g., *Center for Science and the Environment*)

Promote energy efficiency in India (e.g., *Energy Efficiency Services Limited*)

Test market-based mechanisms to help drive down air pollution in Gujarat (e.g., *Energy Policy Institute of Chicago*)

Advance renewable energy uptake, including in poor households (e.g., *Shakti Sustainable Energy Foundation*)

Reduce black carbon emissions by promoting cleaner burning cookstoves and fuels (e.g., *Global Alliance for Clean Cookstoves*)³⁷

Forests in Brazil and the Amazon

To stabilize the climate while meeting increasing demand for food and fiber, the world must protect and manage forests and agricultural lands to reduce their contribution to climate pollution and enhance their ability to store carbon.

Tropical forests, mostly in the Amazon and Indonesia, present an enormous opportunity to reduce emissions on a global scale: Ending tropical forest loss and allowing degraded forests to regenerate would reduce overall global greenhouse gas emissions by at least 25%. To help meet this challenge, EDF is building on a quarter century of experience in Brazil to help curb deforestation across the Amazon, which lately has been on the rise.

Between 2006 and 2016, Brazil reduced its Amazon deforestation rate by about 60% compared to the previous decade. It accomplished this by enforcing its once lax forest protection laws, by supporting forest reserves and by recognizing indigenous lands over an area the size of France. EDF helped defend the rights of indigenous peoples by supporting legal recognition and effective protection of their territories.

In recent years, however, the threat to the Amazon forest and its peoples has rebounded. In Brazil, political crisis and recession since 2015 have led to budget cuts, increased political hostility to forest protection and declining enforcement. As a result, for the first time in a decade, deforestation rose for two consecutive years, in 2015 and 2016.

Relying on our deep relationships with local environmental advocates, indigenous peoples and government officials, EDF aims to help Brazil get back on track to meet—and strengthen—its deforestation targets. At the same time, we will also explore expanding our efforts in Peru and Colombia, which are the Amazon countries containing the largest tracts of forest after Brazil.

The opportunity to earn carbon market credits for verified reductions in deforestation emissions, on a national or statewide basis, would help make tropical forests worth more when left standing than when cleared for agriculture. EDF will advocate the inclusion of forest credits in carbon markets in California and the international civil aviation sector.

To create additional market incentives for large-scale forest protection, we will help develop criteria for “Zero Deforestation Zones,” then work with leading consumer goods companies to source products from these zones.

KEY EFFORTS OUTSIDE EDF

Reduce emissions from deforestation and burning of peat in Indonesia (e.g., *The Nature Conservancy*)

Integrate remote sensing data to pinpoint deforestation as it occurs (e.g., *World Resources Institute*)

Integrate the issues of food, health and sustainability (e.g., *EAT Forum*)

Establish large-scale frameworks for results-based finance for reducing emissions from deforestation and forest degradation (REDD+) (e.g., *Norwegian Climate and Forest Initiative*)

Demonstrate model for jurisdictional approaches to reducing deforestation and promoting low-emissions economic development (e.g., *Acre State Incentive System for Environmental Services*)³⁹

OBJECTIVE FOR 2025

- Zero net carbon dioxide emissions from deforestation are achieved for Brazil and the entire Amazon.

Some of our partners: Climate and Forest Capital, Coordinating Body for the Indigenous Peoples of the Amazon Basin (COICA), Instituto Socioambiental, ICV, AMAZON, IPAM.³⁸

Transportation

The transport sector accounts for about one-quarter of global greenhouse gas emissions from fossil fuels. Though emissions in this sector are projected to grow as the world's motor vehicle population doubles over the next 20 years and oil remains the dominant fuel source, rapid innovation offers a chance to change that equation.⁴⁰ Mobility services are exploding, longer-range and lower-cost electric vehicles are a reality, and the sharing economy is taking off.⁴¹

On the policy front, progress is already being made. The International Civil Aviation Organization (ICAO) has set a goal of capping net emissions for international flights at 2020 levels and adopted a new flexible market system to meet that goal.⁴² This new system could become the spine of a global carbon market. Global shipping interests have begun exploring similar options to address emissions (see p. 16).

On the roads, new regulations in the United States, Europe, Japan and China will reduce new passenger vehicle CO₂ emission rates by up to half. These reductions will not, however, fully offset global growth in the sector.⁴³ As a result, cars, buses and trucks are expected to remain a dominant source of emissions.

The question is how best to alter that outcome by seizing the opportunities presented by emerging technological advances. EDF has commissioned an analysis to inform our strategy and define our role in this sector going forward. Our work with allies on U.S. emissions standards has secured transformative climate and health gains and provides a foundation for global progress.

We are looking at additional opportunities in the United States, China, Europe and India. We are optimistic that the next decade will be a revolutionary one for vehicles, and we'll be exploring what role EDF might play in helping to shape this change.

SPOTLIGHT ON

Business



POWERFUL PARTNERS

“By working with high-impact companies to set aggressive goals and then execute against them, we catalyze environmental leadership, collaboration and results across entire industries.”⁴⁴

Tom Murray
Vice President, EDF+Business

EDF's work with leading companies and investors, like the other cross-cutting strategies spotlighted in this plan, advances our objectives and delivers results across all of our focus areas.

For more than 25 years, we have partnered with industry leaders like FedEx, KKR, McDonald's and Walmart to drive major shifts in their products, operations, supply chains and advocacy.⁴⁵ Time and again we have proven that good environmental strategy is good business strategy, empowering hundreds of companies to save billions of dollars by reducing greenhouse gas pollution.

Accelerating change



THE POWER OF THE MARKET

“When the world’s major economies put an effective price on carbon emissions, we’ll see everyone rushing to reduce carbon.”

Dr. Nathaniel Keohane
Vice President, Global Climate

Look beyond the climate impacts of power plants, oil wells and industrial agriculture, and you will see people striving to secure basic needs for economic stability, energy and food. Finding new ways to meet those needs allows low-carbon growth to become a pathway to economic prosperity rather than a perceived impediment.

Technological innovation is a critical component of this vision, as it can radically reframe the presumed conflict between prosperity and protection. Recent advances in wind and solar, for example, have so dramatically driven down costs that these renewables are now competitive with coal in much of the world, a key reason that renewable power (including hydro) supplied more than half of new global electricity demand in 2016.⁴⁶ We also must build our understanding of technologies and practices to remove CO₂ from the atmosphere, including ways to increase carbon in agricultural soils now and emerging chemical-based processes that may become viable in the future.

Policies that align economic incentives by putting a price and limit on carbon can further accelerate progress. A price on carbon gives emitters an incentive to reduce emissions at the lowest cost; rewards innovation in cost-effective technologies; drives private finance; and can generate revenue to address social issues. By aligning economic growth and emissions reductions, carbon pricing can ultimately promote more ambitious action and unleash innovation to transform energy, transportation and agricultural systems. For example, California—home to one of the world’s most comprehensive carbon markets—has attracted more than 40% of all U.S. clean tech investment in the last decade.⁴⁷ EDF is building momentum among a core group of countries to expand carbon pricing globally, building from the Paris Agreement. An effective international carbon market could cut by more than half the costs of putting the world on a low-carbon pathway by the middle of this century.⁴⁸

Linking air quality and public health to climate mitigation is another accelerator for climate progress—especially in developing countries, where air pollution is

KEY EFFORTS OUTSIDE EDF

Coordinate nonprofits from around the world to engage on climate policy (e.g., *Climate Action Network*)

Quantify and publicize the economic risks from climate change (e.g., *Risky Business Project*)

Track the migratory patterns of animals using GPS to understand how animals interact with the environment and respond to changes such as habitat destruction and climate change (e.g., *Movebank*)⁴⁹

a public health crisis in many cities. Because poverty alleviation and access to energy are also high priorities in these areas, there is a real opportunity to build markets for conventional air pollutants that would improve public health and make clean energy more economically viable than dirty coal. We are focused on this air quality approach in China and India.

We are also gearing up for even more ambitious action on global methane reductions. Human-caused methane emissions are responsible for around 25% of the warming our planet is experiencing right now, and the oil and gas industry is the single largest industrial source of this pollution. Achieving a 45% reduction in oil and gas methane emissions globally could reduce warming by about 0.5° F below business-as-usual by the end of the century. To this end, we are expanding our oil and gas methane reduction work beyond North America to new regions, including Europe (see p. 16), Asia and the Middle East, launching a global methane science initiative, and engaging directly with the world's largest oil and gas companies, such as our ongoing partnership with the Oil and Gas Climate Initiative, a coalition of ten top global producers.

Another accelerator for climate action lies in new ways to gather and process data, including lower-cost sensors and satellites. No longer can government alone reveal—or choose to conceal—serious pollution problems. EDF is declaring independence from this monopoly by putting cutting-edge science into practice at a global scale. The flagship of this approach is an innovative satellite that we and our partners hope to launch to accurately measure methane emissions from global oil and gas operations. Tied to our methane science initiative, the satellite would provide the global community with a source of accurate methane emissions data, allowing for unprecedented levels of transparency and accountability and empowering progressive actors in government, industry and civil society to drive these emissions down.

OBJECTIVES FOR 2025

- Global methane emissions from the oil and gas sector are cut 45% from 2012 levels.⁵⁰
- Be on track for half of all global CO₂ emissions to be covered by durable, declining limits achieved with a carbon price by 2030.⁵¹
- An improved understanding is achieved of technologies and practices that may be used to remove CO₂ from the atmosphere.

Some of our partners: Aviation Environment Federation (UK), Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants, Environmental Law Institute, Green Business Certification, Inc., International Emissions Trading Association, Getúlio Vargas Foundation, Mario Molina Center, Motu Economic and Public Policy Research, Oil and Gas Climate Initiative.⁵²

SPOTLIGHT ON

Science



A SCIENCE-CENTERED ORGANIZATION

“EDF scientists work with counterparts around the world to conduct and apply cutting-edge research to the world’s most pressing environmental problems.”

Dr. Steven Hamburg
Chief Scientist

Founded by scientists in 1967, EDF continues to use the latest science to identify problems and shape the most effective remedies. We partner with a broad range of academic experts, hire senior contributing scientists from many disciplines, and populate our staff with scientists dedicated to our program work. And we coordinate some of the most ambitious research in the environmental field.

Our work on methane is a case in point. The problem of methane leakage from oil and gas infrastructure was not on the radar a decade ago, but we saw a need, met it by coordinating dozens of field studies and peer-reviewed papers, and changed the public debate.⁵³

Oceans



OCEANS OF ABUNDANCE

“Getting fishing right today means we can sustain the changing ocean world of tomorrow, improving the well-being of hundreds of millions of people around the world.”

Amanda Leland
Senior Vice President, Oceans

Our vision of the future

The fortunes of people everywhere are inextricably linked to the oceans. Our health, happiness and quality of life depend on their well-being. Nowhere is this more evident than in the world’s poorest, most vulnerable communities, where people rely on the oceans to meet their most basic everyday needs.

Over the past few years, EDF has made substantial progress against our goals to reverse overfishing and restore the seas to abundance, improving jobs and economic prosperity in the process. We have expanded into eight new geographies and established dozens of new partnerships. By rebuilding fisheries in these areas, we seek to secure nutrition and better economic conditions for 400 million vulnerable people by 2030.

New fishing systems that EDF helped design in Sweden, the Philippines and Belize are showing real promise for people and the oceans. In the United States, overfishing is at a historic low and many chronically overfished species are fully rebuilt, often years ahead of schedule. Pacific groundfish and Gulf red snapper are rebounding due to an approach that encourages fishermen to be stewards of the resource by giving them a stake in their fisheries’ health.

We are learning how to work in new geographies across the political and cultural spectrum by building new partnerships, creating innovative solutions and collaborating on groundbreaking science. We have successfully expanded our work to many small-scale, community-based fisheries. Overall, small-scale fisheries make up one-third of the world’s catch and are often located in areas of the world where people are hungry and malnourished. It is here that failing fisheries have an outsized impact on well-being.

We are making good progress, but the challenge of overfishing remains one of the world’s most pressing environmental problems.

To meet this challenge, we are increasing our emphasis in a few areas to reflect the latest science and amplify our impact. These include: building climate change adaptation into our fishery reform efforts; using technological and other innovations to accelerate change; and designing recovery plans that improve the health of those at direct risk from overfishing.

Thriving, resilient oceans that support more fish, feed more people and improve prosperity are within reach. With every success, healthy oceans sustain the well-being of nations, communities and people around the world.

“We are taking a leadership role in the future of our fisheries and EDF has been a great partner in supporting us.”

Peter Olsson

Swedish Fishermen's Producer Organization



TODAY: VULNERABLE COMMUNITIES RISK MALNUTRITION.



TOMORROW: RESILIENT OCEANS SUPPORT MORE FISH . . .



. . . FEED MORE PEOPLE . . .



. . . AND IMPROVE PROSPERITY AND WELL-BEING.

EDF's oceans vision

In our lifetimes, create thriving, resilient oceans that provide more fish in the water, more food on the plate and more prosperous fishing communities, even with climate change.

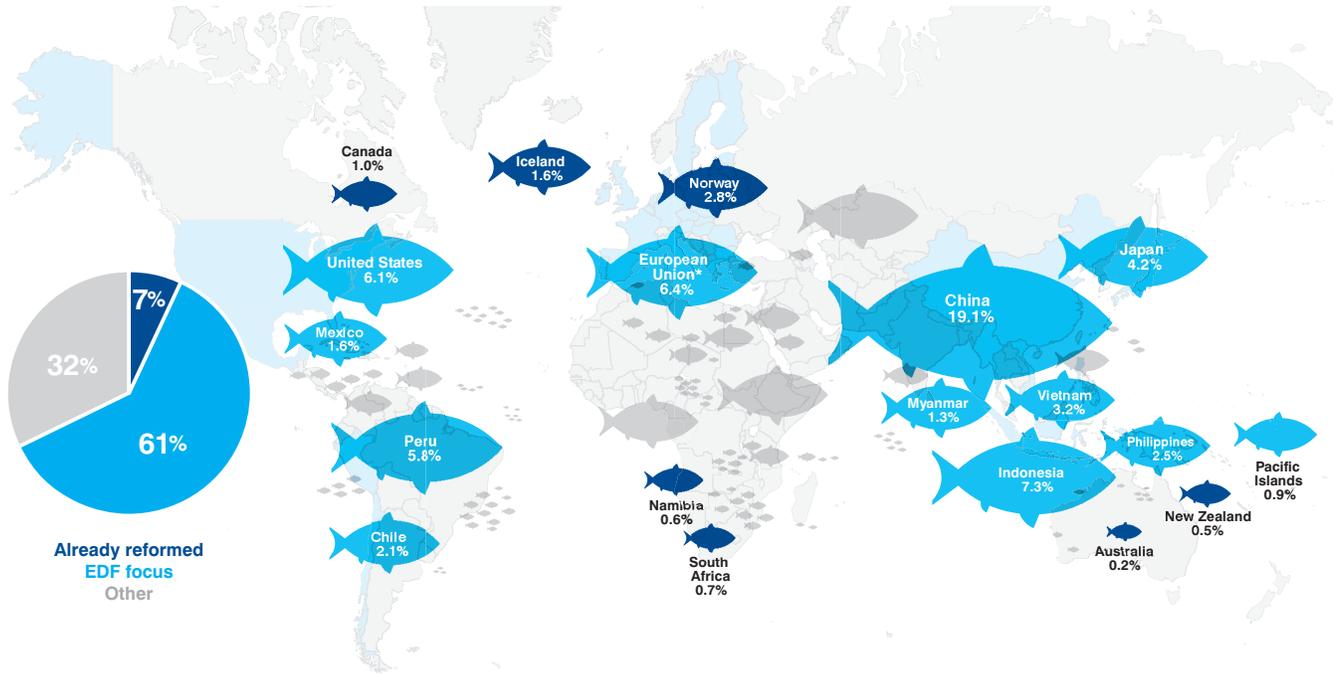
2025 goal

Reduce global overfishing by 30% by 2025, in order to boost fish in the sea by 50% and enhance well-being for 400 million vulnerable people by 2030.

Theory of change

EDF aims to spur reforms so that sustainable fishing becomes the norm in 12 places that account for 61% of the global catch. Success at this scale could transform the global seafood system so that sustainable fishing takes hold worldwide.

Restoring oceans to abundance



Seven countries, shown in dark blue and representing 7% of global catch, already have largely transformed their policies and practices to sustainable fishing. EDF will focus on 12 additional places, shown in bright blue and representing 61% of the catch, to catalyze similar reforms. All percentages are for 2015 (Food and Agriculture Organization of the United Nations). *After 2019, European Union and United Kingdom.⁵⁴

Turn the tide of overfishing

By getting fishing right today, we can help ensure a more resilient ocean world tomorrow. A healthier ocean and healthier people are possible, despite the impacts of climate change.

That is the conclusion of new research under development by scientists and economists at EDF, University of California Santa Barbara and Hokkaido University.⁵⁵ The work shows we face two very different potential futures.

We can allow the compounded effects of climate change and poor fisheries management to lock in depleted oceans and malnutrition for hundreds of millions of people. Or we can embrace practical solutions that, in comparison, can deliver nearly twice as much fish biomass, substantially more yield and about five times the profits to fishermen and communities.

Our work shows there is great promise for the oceans and those who rely on them—but only if we act now. Improving fisheries management today is essential so that ocean ecosystems can sustain human well-being for the future. Practical experience shows that improved management is working in countries like Australia, Belize, Namibia, Sweden and the United States, which are reversing overfishing, reviving coastal communities and bringing the oceans back to life.

In the United States, EDF has helped spur significant advances in sustainability. Overfishing is at historic lows, while fishing jobs and revenue have grown. Dozens of species are on the rebound, and several chronically overfished species—including bocaccio and darkblotched rockfish on the Pacific Coast—are now fully rebuilt, in some cases years ahead of schedule.

Those rockfish are part of the Pacific groundfish fishery, declared a federal disaster in 2000. With fishermen and other partners, EDF designed a new management approach—called “fishing rights”—that gave each fisherman a secure share of the catch in exchange for strong accountability. The fishery’s remarkable turnaround was celebrated in 2014, when the Marine Stewardship Council certified 13 species as sustainable and the Monterey Bay Aquarium Seafood Watch program scored many species as a “good alternative.”⁵⁶

By the early 2000s, overfishing had decimated the population of the iconic Gulf of Mexico red snapper to just 4% of its historic levels. The fishery was collapsing. Today, the population is now three times the size it was in 2007, when EDF helped reform the commercial fishery. Fishermen’s revenues have doubled, and their success has inspired parts of the recreational fishing community to pursue similar reforms.⁵⁷



Dave King/Flickr



COASTAL PARTNERSHIPS

“Communities are the lifeblood of the fishing industry in Mexico. I’m proud to work alongside them to build sustainable fisheries that improve lives, livelihoods and prosperity.”

Dr. Laura Rodriguez
Senior Director, Mexico Oceans Program

The Central American nation of Belize recently became the first country in the world to adopt national reforms for small-scale fisheries. Overfishing was threatening the Mesoamerican Reef, the largest barrier reef in the Western Hemisphere, which supports more than 500 species of fish. In 2008, EDF teamed up with local partners to enlist fishermen, policymakers and managers in pilot projects to rebuild the coral reef ecosystem with a system of secure fishing rights coupled with no-take zones tailored to the local context.

In just a few years, illegal fishing dropped 60%.⁵⁸ In response to the progress, fishermen are now collaborating with government officials to report catch data and develop science-based catch limits. Their support for no-take zones has grown as they see productivity rise. And the momentum is building as the government of Belize aims to expand sustainable management to all major commercial fish species and dramatically increase no-take zones.

China poses an oversized challenge and opportunity for global fisheries. It is the world’s largest fishing nation by far, with a global web of business connections. As they take on reforms in their domestic fisheries, key leaders in the Chinese government have invited EDF to partner on developing and advancing solutions. Climate change resilience and food production will be major areas of focus.

Over the next five years, we will work to ensure that sustainable fishing remains firmly established in the United States, while forging ahead with efforts already underway in Europe, Latin America and Asia Pacific.

EDF aims to catalyze reforms making sustainable fishing the norm in 12 places that account for 61% of the global catch. Success at this scale could transform the global seafood system so that sustainable fishing takes hold worldwide.

Adapting to climate change

Ongoing research by EDF and partners shows that getting responsible management in place now will make or break future fisheries faced with climate change. A key first step is management that includes fishing limits, ensures fishermen are accountable to staying within those limits and establishes mechanisms for flexibility as ocean conditions change. One of the biggest challenges resulting from climate change is that the ranges of species are

KEY EFFORTS OUTSIDE EDF

Fighting illegal, unreported and unregulated fishing (e.g., *Global Fishing Watch*)

Set standards to move aquaculture toward environmental sustainability and social responsibility (e.g., *Aquaculture Stewardship Council*)

Certify sustainable wild fisheries (e.g., *Marine Stewardship Council*)

Help consumers select sustainable seafood (e.g., *Monterey Bay Aquarium’s Seafood Watch*)⁵⁹

shifting as waters warm. This can accelerate overfishing as more countries begin to target the same fish populations. To help overcome this challenge, we are building an adaptation toolkit that will improve coordination and cooperation between countries to ensure fishery sustainability even as the oceans change.

Catalytic levers of change

We work closely with the fishing industry, communities and governments to ensure that they experience the full benefits of sustainable fishing. At the same time, we are exploring how finance, education and capacity-building, and supply chain interventions can accelerate the adoption of sustainable fishing practices. In the Lampung province of Indonesia, for example, we are training and mentoring local stakeholders as they develop a new approach for managing their blue swimming crab fishery.

We also see the potential for technology to increase the effectiveness of sustainable fishing systems, especially in small-scale fisheries where government investment is lacking. Simple smartphone apps and other digital platforms can be used to create real-time data systems to monitor catch, leading to improved management of, and access to, fish stocks.

Improving health and nutrition

Millions of vulnerable people rely on fish for essential micronutrients like zinc, Vitamin A and fatty acids, and 10% of the world's population is at risk of malnutrition related to overfishing. According to research by Golden and co-authors, this number is only likely to increase if we do not take action.⁶⁰

We can dramatically increase the scale of reforms by putting sustainable fishing on the agenda of development and aid agencies. Because rebuilding fisheries that can support human health in the long term requires short-term reductions in fishing before stocks rebound, we also need to optimize fisheries to meet the immediate nutritional needs of communities at risk.

OBJECTIVES FOR 2022

- Nearly a third of the world's catch is under policies or practices that make sustainable fishing the norm.
- Breakthrough collaborations and innovations in technology and science accelerate widespread adoption of sustainable fishing.
- Key fisheries in Asia, South America and Europe have robust systems in place to address climate change impacts, including species range shifts.

Some of our partners: Althelia Ecosphere, China Society of Fisheries, Cornell University, Duke University, Food and Agriculture Organization of the United Nations, University of the Philippines Visayas, Wildlife Conservation Society, WWF.⁶¹

Fishing for prosperity



Ecosystems



ALIGNING ECONOMIC INCENTIVES

“We’ll get lasting results by giving landowners economic incentives to protect the environment.”

David Festa
Senior Vice President, Ecosystems

Our vision of the future

Healthy ecosystems are essential for human prosperity and the well-being of wildlife. But these natural systems face unprecedented pressure from the extremes of a warming world and the demands of a growing population.⁶² Globally, two-thirds of rain-dependent farm and ranch lands have seen substantial changes in rainfall, raising troubling questions about food security.

We must respond to these extraordinary threats with an equally big idea: resilience—the ability to cope well with adversity and to respond creatively and quickly to opportunity. As we work to limit future climate change, we must simultaneously prepare human and natural communities to adapt to the damaging changes we cannot avoid. We do not underestimate the size of this challenge or the scope of potential dangers. But we do have a clear vision for what must be done to secure the places we live, the water we drink, the food we eat and the wildlife that shares our planet.

As sea level rises and storms strengthen, we are in a high-stakes race against time to restore the protective marshes and floodplains along coasts and rivers. Including natural protections, such as wetlands, in future flood prevention infrastructure investments will decrease losses of life and property while creating new habitat for wildlife.⁶³

As periods of drought and episodes of excessive rainfall become more common, more effective water management will be our only hope of sustainably meeting the needs of both people and agriculture. Improving agricultural practices presents a huge opportunity, as croplands and pastures are the biggest consumers of fresh water.⁶⁴

To help wildlife become more resilient, we need to restore habitat at scale so that animals can move with shifting climate patterns. And reducing nutrient pollution will be ever more important as more intense downpours increase fertilizer runoff.

Healthy ecosystems play a vital role in managing risk and uncertainty. They also define us as a people—they are where we live, work and play. Becoming more resilient will require new levels of creativity, collaboration and resolve. By facilitating a mix of constructive private actions, well-designed market-based solutions, effective governmental efforts, and judicious laws and rule making, we can protect both ourselves and the natural world. It’s not an easy task, but it is the way forward.

“The only way to sustain basic human needs is to sustain healthy ecosystems. EDF’s vision offers an inspiring path forward.”

Jonathan Foley, Ph.D.

Executive Director, California Academy of Sciences



ECOSYSTEMS ENCOMPASS: THE PLACES WE LIVE . . .



. . . THE WATER WE DRINK . . .



. . . THE FOOD WE EAT . . .



. . . AND THE WILDLIFE WE PROTECT.

EDF’s ecosystems vision

Resilient land and water systems allow nature and a growing human population to prosper in a changing climate. We envision prosperity to include health, economic and social well-being, clean water and air, fertile soil and enjoyment of nature in all of its richness and diversity.

2025 goal

Incentives are in place to reward owners and managers of working lands for generating environmental benefits while maintaining productivity of farms, ranches and forests. In the areas where EDF is working, negative trends in fertilizer runoff, habitat loss, coastal erosion and water consumption have been reversed.

Theory of change

Creating economic benefits and cultural expectations for practices that improve ecosystems will cause the adoption of those practices to increase.

Build resilient coastal communities



Nearly 40% of people around the world live in coastal zones, making them vulnerable to storms, sea level rise and flooding.⁶⁵ While we cannot fully protect these communities from climate impacts, we can reduce risk by helping them work with nature. In the Mississippi River Delta, where decades of mismanagement have caused the loss of more than 1,900 square miles of coast, EDF and partners are pioneering large-scale adaptation strategies.⁶⁶ Our centerpiece is the Louisiana Coastal Master Plan, which will harness the Mississippi River to rebuild land and restore natural infrastructure—wetlands, barrier islands, oyster reefs—that sustains this wonderful delta.

We are committed to helping threatened communities shape their own futures, rather than being at the mercy of the next storm. And because so many coastal areas face similar challenges, we will share our successes and challenges with the global community by encouraging the development of international guidance for building natural protections.

OBJECTIVES FOR 2022

- \$3.5 billion is being invested on an annual basis in the design or construction of sustainable natural infrastructure to reduce coastal risks.
- Community-based resilience planning is built into adaptation efforts in Louisiana as a model for the rest of the world. Learning from Louisiana's adaptation experience is actively considered in three other U.S. areas and two areas outside the country.
- An adaptive management system for large-scale sediment diversion on the lower Mississippi River is in place, taking advantage of improved monitoring technologies.

Some of our partners: Coalition to Restore Coastal Louisiana, Lake Ponchartrain Basin Foundation, National Audubon Society, National Wildlife Federation, The Nature Conservancy, Restore or Retreat.⁶⁷

KEY EFFORTS OUTSIDE EDF

Evaluate the potential of innovations in coastal science and engineering (e.g., *The Water Institute of the Gulf*)

Directly engage business leaders to advocate for effective coastal restoration and support financing innovation (e.g., *Greater New Orleans, Inc.*)

Advance protection and restoration of natural and beneficial functions of floodplains (e.g., *The Association of State Floodplain Managers*)⁶⁸

Rebalance water systems

Climate change and population growth are stretching our freshwater resources beyond their limits—particularly in arid and semi-arid environments, where 40% of the global population lives and where irrigated agriculture is a dominant water use.⁶⁹

The challenge is particularly urgent in the American West, where historic drought and overallocation have put major river systems at risk. As a result, groundwater levels are plummeting, agriculture is getting squeezed, wildlife is threatened and many communities have lost access to safe drinking water.

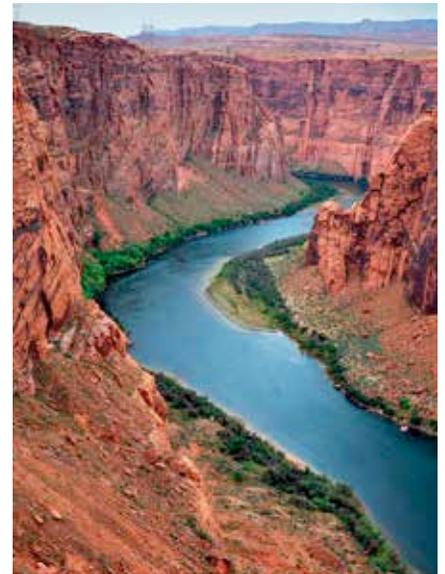
Our goal is to rebalance these water systems and make them more resilient to climate change. We see opportunities for innovation and collaborative solutions. Policies already in place, such as California’s Sustainable Groundwater Management Act, mandate more proactive decision making.⁷⁰ Technological tools are making smarter water use more attainable. And water users of all kinds are thinking differently about how they share, save and allocate water. Scarcity is focusing people’s minds—a prerequisite to successful reform.

We are focusing our work on three areas: modernizing groundwater management, improving and expanding healthy water trading programs, and incentivizing the sustainable use of agricultural water. In these areas, we collaborate with farmers and cities to better incorporate the needs of all water users—including rural, disadvantaged communities and the environment, two important, yet often overlooked, stakeholders.

OBJECTIVES FOR 2022

- Sustainable groundwater management plans that improve ecosystems and include water trading are being implemented in at least three groundwater basins.
- At least two major water deals to reduce water diversions from the Colorado River provide for farmers’ active participation in water markets and habitat restoration.
- Satellite-based measurement of agricultural water use is available at low cost through a web interface to farmers, water managers and others across the West.
- Water trading in California and Arizona is on track to double from 2016 levels by 2025.

Some of our partners: American Rivers, Audubon California, Friends of Verde River Greenway, NASA and Desert Research Institute, Rural Community Assistance Corporation, Self Help Enterprises, Yuma County Water Users Association.⁷¹



The watershed of the Colorado River covers parts of seven Western states.

KEY EFFORTS OUTSIDE EDF

Promote groundwater recharge on California agricultural lands (e.g., *Sustainable Conservation*)

Protect and maintain healthy flows in the upper Colorado River Basin (e.g., *Western Resources Advocates*)

Ensure that rivers, springs and creeks in Texas continue to flow (e.g., *Texas Living Waters Project, a collaboration of National Wildlife Federation, Sierra Club and Galveston Bay Foundation*)⁷²

Expand habitat on working lands

The science is clear. We are poised to enter a period of increasing extinctions as a result of climate change and human population growth, among other factors.⁷³ The consequences would be dire not only for wildlife but also for people, who need healthy ecosystems to provide clean water and a bank of genetic diversity for new varieties of food and medicine.

To step back from the brink of mass extinctions, we need a strategy that embraces working lands—lands used to produce food, fiber, timber and energy, which make up more than half the world’s land area.⁷⁴ These areas are also where wildlife is most threatened and where we can make the biggest advances in restoring habitat.

The individuals, families and businesses who manage working lands are influenced by many motivations and constraints. But in all cases, they need to get paid for their work. Farmers don’t produce crops for free, and we cannot expect them to provide wildlife habitat for nothing. In 2015, EDF rolled out a powerful new approach called habitat exchanges, which allow farmers, ranchers and timberland owners to generate and sell credits for measurable ecosystem benefits. We have hit our goal of getting exchanges or their equivalent approved in five of the eight U.S. Fish and Wildlife Service regions. We will continue to implement exchanges across the United States and to test the approach internationally.

We will also need to protect and improve the Endangered Species Act and laws that require developers to mitigate the environmental impacts of their operations—all of which are increasingly under threat in the current political climate. Without these drivers, there is no market for habitat improvements.

OBJECTIVES FOR 2022

- The U.S. Endangered Species Act and compensatory mitigation requirements continue to protect habitat and wildlife.
- \$1 billion is invested annually through habitat exchanges or their equivalent in the United States.
- Habitat exchanges are established in at least one country outside the United States.

Some of our partners: Colorado Cattlemen’s Association, Environmental Incentives, National Audubon Society, University of Minnesota Monarch Lab.⁷⁵



Landowners are stepping up to protect habitat for the monarch butterfly in a new habitat exchange.

KEY EFFORTS OUTSIDE EDF

Use legal strategy and policy advocacy to ensure that the Endangered Species Act remains strong (e.g., *Defenders of Wildlife*)

Protect critically important habitat and wildlife corridors (e.g., *The Nature Conservancy*)

Conduct research and influence policymakers to design and implement local and global solutions to plant and animal conservation (e.g., *Wildlife Conservation Society*)⁷⁶

Make fertilizer pollution obsolete

Food production leaves its mark on the environment. Nowhere is this more evident than in the use of fertilizers, which are essential for growing crops but which also contribute to climate and water pollution.

Working with agricultural partners, we have helped develop and test a set of practices that improve fertilizer efficiency. These can reduce harmful runoff and make farmland more resilient to climate change, retaining moisture during periods of drought and lessening erosion during heavy downpours. Emerging science shows that some of these same practices also reduce greenhouse gas emissions and may sequester carbon in the soil.

The challenge has been to bring this work to scale. As one way to engage more farmers, EDF is leveraging Walmart's commitment to cut greenhouse gas emissions from its supply chain. Thanks to our partnership with the world's largest retailer, we have built new relationships with food suppliers and provided expertise to help them produce food more sustainably.

This has already brought us halfway to our 2022 goal of having commitments to improve fertilizer and soil management practices on 45 million acres, half of U.S. corn acreage. To go the distance, we will develop better ways to track progress toward environmental outcomes and align public and private financial incentives to reduce the risk for participating farmers who invest in these environmental benefits.

With 40% of the world's land used for food production, wider adoption of these practices could improve water quality and reduce net carbon emissions on an even larger scale.

OBJECTIVES FOR 2022

- Companies across the food supply chain adopt greenhouse gas or water quality targets that drive fertilizer management improvements on half of U.S. corn acreage.
- Nutrient balance is established as the standard metric for quantifying nitrogen loss from agriculture, and tools and incentives are provided to reduce that loss.⁷⁷
- A technology platform is launched that allows greater transparency and scientific rigor in tracking reductions in greenhouse gas emissions and improvements in water quality across the supply chain.
- 2018 Farm Bill reauthorization and administrative action align policy and spending to promote conservation, increase soil health and boost resilience on agricultural lands.

Some of our partners: Field to Market, National Corn Growers Association, Smithfield Foods, Walmart.⁷⁸



Corn is one of the most fertilizer-intensive crops.

KEY EFFORTS OUTSIDE EDF

Develop strategies for improving soil health (e.g., *The Nature Conservancy's Soil Health Roadmap*)

Develop standards for sustainable food supply chains and tackling food waste (e.g., *World Wildlife Fund*)

Call attention to the risk of drinking water contamination by agriculture, among other sources (e.g., *Environmental Working Group*)⁷⁹

Health



REDUCING UNHEALTHY EXPOSURES

“We can secure a healthy future for our children and grandchildren if we take steps today to ensure the safety of chemicals and dramatically cut air pollution.”

Dr. Sarah Vogel
Vice President, Health

Our vision of the future

People will enjoy healthier and more prosperous lives when we significantly reduce their exposure to pollution, including toxic chemicals and harmful air.

Imagine a future where decisions made about how we develop our communities—from the energy we use to the products we make—support the health and well-being of everyone.

That future is possible, but it is not the reality today. Everyday exposures to toxic chemicals and air pollutants increase the risks of heart and lung disease, adverse birth outcomes, reproductive problems and infertility, and learning and behavioral problems in children. That harms individuals, our economy and our society. According to the World Health Organization, air pollution alone results in six million premature deaths annually worldwide from heart attacks, cancer, strokes, respiratory disease and other causes.

Fortunately, technological innovation is providing new ways to make the invisible impacts of pollution visible, empowering communities to take action to protect public health. From low-cost sensors that improve our ability to measure and monitor environmental pollutants to rapid chemical testing technologies, EDF is working to transform data into meaningful, actionable information that will enable smarter policies and practices.

We are using tools that used to be reserved for governments and major corporations, and putting them in service of communities. We are building powerful nonpartisan coalitions, forging partnerships with companies and nonprofits alike, and advocating well-designed public policies that can drive down emissions and toxic chemical use, enhancing the lives of people young and old.

“In medicine the basic teaching is to ‘do no harm.’ EDF is working to prevent serious risks to our health and the health of future generations from exposure to air pollutants and toxic chemicals.”

Richard Jackson, M.D., M.P.H.

Professor of Environmental Health Sciences, Fielding School of Public Health, University of California, Los Angeles
Former Director, National Center for Environmental Health, CDC



OUR CHILDREN DESERVE A HEALTHY START . . .



. . . AND THE FREEDOM TO JUST BE KIDS . . .



. . . THAT MEANS FORMULATING SAFER PRODUCTS . . .



. . . AND SECURING CLEANER AIR FOR EVERYONE.

EDF’s health vision

Human health improves by reducing exposure to harmful chemicals and pollution.

2025 goal

Significantly reduce exposure to high-risk chemicals in consumer products, water and food, and be on track to reduce ambient air pollution globally.

Theory of change

By harnessing protections forged in law, and made possible by advances in information and technology, we can strengthen policies, expand civic engagement and advance supply chain practices that lead to reductions in exposures to harmful chemicals and air pollution.

Reduce exposure to toxic chemicals

Exposure to hazardous chemicals can contribute to serious health conditions including asthma, diabetes, childhood cancers, reproductive cancers and infertility—all of which are on the rise today. For too long, flawed public policies and corporate practices have failed to protect the public from harmful chemicals, or to create incentives to identify and reduce chemical risks.

EDF has been working to accelerate the incentives and increase the capacity to significantly reduce exposures to toxic chemicals. We have achieved remarkable progress, but in the current political environment it is now at risk.

After over a decade of effort by EDF, we have seen important progress on two fronts. In 2016, Congress passed a major overhaul to the chemical safety law that provides the federal government with the tools needed to improve the safety of chemicals. Major retailers like Walmart and Target are taking steps to reduce their chemical footprint and spur innovation in finding safer alternatives.⁸⁰

Over the next five years, EDF will defend and strengthen public policies, continue to advance corporate leadership, and significantly expand actionable information on chemical risks. Protecting people—particularly the most vulnerable—from toxic chemicals demands strong federal safety standards, market leadership, greater access to actionable information and expanded civic engagement.

By aligning policies, markets and information systems, we can unlock a future where the food we eat, the water we drink and the products we use are safe and affordable.

OBJECTIVES FOR 2022

- Strong implementation of the Lautenberg Chemical Safety Act is back on track with timely and health-based decisions on chemicals, including restrictions of high-priority chemicals that present the greatest risks to vulnerable populations.
- Major reductions are achieved in exposures to at least three high-risk chemicals that present significant health risks to infants and children: lead (achieve a 50% drop in children's blood lead levels); phthalates (achieve a significant decline from 2016 national biomonitoring levels); and perchlorate (be on track to drop to 2005 levels).
- 25% of personal care and household products are reformulated with safer ingredients, removing more than 50 million pounds of chemicals of concern from store shelves, and this trend is expanded to other product categories including food.

Some of our partners: American Water Works Association, Chemical Footprint Project, Children's Environmental Health Network, Earthjustice, Elevate Energy, Walmart.⁸¹

Cadmium, Lead, Mercury, Benzene, 1,4-Dichlorobenzene, MTBE, Toluene, Cotinine, Perfluorooctanoic acid, Perfluorooctanyl sulfonate, Polybrominated diphenyl ethers (PBDE-47, PBDE-99, PBDE-100, PBDE-153), PCB-118, PCB-138 and -158, PCB-153, PCB-180, DDT, DDE, Hexachlorobenzene, Dimethylphosphate, Diethylphosphate, DMTP, Diethylthiophosphate, Dimethyldithiophosphate, BPA, Triclosan, Benzophenone-3, Monobenzyl phthalate, Monoisobutyl phthalate, Mono-n-butyl phthalate, MEP, 9-Hydroxyfluorene, 2-Naphthol, 2-Hydroxyphenanthrene, 1-Hydroxypyrene, Perchlorate

Pregnant women are exposed to multiple chemicals of concern, as revealed by blood tests and other biometrics.⁸²

Improve air quality around the world

Air pollution kills people, makes them sick, limits their ability to work and learn, and degrades ecosystems. All of this imposes costs on society. In 2015, air pollution caused at least six million premature deaths worldwide, two-thirds due to outdoor air pollution, with nearly half those deaths in China and India.⁸³ (By comparison, in 2015, HIV-AIDS, tuberculosis and malaria combined caused around three million deaths.)⁸⁴ And outdoor air pollution is expected to rise, with a death toll potentially as high as nine million by 2060.⁸⁵

No one wants to breathe noxious air. And no nation wants to hamstring its economy or rob its citizens of their well-being. A healthy, prosperous future is one where people and nature thrive as air pollution declines.

Since the 1970s, the United States has seen a 70% decline in air pollutants while enjoying a more than 200% increase in GDP.⁸⁶ EDF has played a pivotal role in reducing air pollution, and we must defend and expand the policies and practices that made this possible. Globally, as China and India continue on paths of tremendous growth, they, too, are positioned to become leaders in innovation that decouples air pollution from development.

By aligning policies and incentives to drive reductions in multiple pollutants, our solutions address both poor health and climate change. To support these efforts, EDF is also working to help scale hyperlocal air pollution monitoring and mapping. By generating actionable data on air quality for communities around the world, we will build knowledge and political support to reduce emissions.

Our focus is on significantly reducing outdoor air pollution in the United States, India and China. All are leading greenhouse gas emitters; India and China face air pollution crises and have made commitments to reduce climate pollution.

OBJECTIVES FOR 2025

- Deep reductions in multiple air pollutants are secured in the United States that by 2025 annually prevent 15,000 deaths, more than one million missed school and work days and half a million asthma attacks.
- Hyperlocal air quality mapping is available to communities around the world, providing scientifically robust, actionable data to inform policy and civic innovations.
- India is on track to achieve compliance with National Ambient Air Quality Standards for conventional pollutants by 2030, while building capacity to address climate pollution.⁸⁷
- Air quality is improved by 40% from 2013 levels in the Beijing-Tianjin area by 2020.

Some of our partners: Google Earth Outreach, Harvard Environmental Law Program, One Breath Partnership, Rice University.⁸⁸



KEY EFFORTS OUTSIDE EDF

Provide consumers with reliable information on how to avoid hazardous exposures (e.g., *Silent Spring Institute*)

Research and analysis of the impacts of air emissions to inform practices and policies (e.g., *Clean Air Task Force*)

Support of clean air and safer chemical policies to prevent disease and disability (e.g., *Learning Disabilities Association*)⁸⁹

Infrastructure



MAKING A DIFFERENCE

“Investing in a highly effective infrastructure team will facilitate EDF’s continued growth and success.”

Jessica Isaacs
Chief Administrative Officer

The foundation of all our work

Just as communities depend on their roads, bridges and public utilities, EDF depends on its infrastructure of information technology, facilities, financial and legal expertise and—most of all—people to maximize our donor resources and achieve our environmental goals. Whether it’s about attracting the best staff and ensuring they have a safe, productive space to work, or designing information systems to connect team members across the globe, the infrastructure that supports our work is essential to our success.

Today’s difficult environmental challenges—and the increasingly global program goals of this ambitious new strategic plan—underscore the need to strengthen EDF to perform on a new scale that reaches around the world.

Human resources Our strength as an organization depends on a highly skilled staff, Board and network of partners. We aim to recruit and train an international workforce comprised of top-flight talent, and build a robust pipeline of leaders and experts to carry our mission forward. When our work takes us into new geographies, we will rely on strong local leadership, forge partnerships with effective local stakeholder organizations, and ensure that our internal managerial capacity keeps pace with our growth.

Diversity EDF envisions a world in which people from all backgrounds and experiences feel connected to the environmental challenges we face and are engaged in creating durable, equitable solutions. We will realize this vision by continually increasing the diversity of our staff; growing our cultural competency; and partnering with diverse communities on environmental justice activities. We are among the first green groups to have a senior position on diversity; 63% of our workforce are women, 26% self-identify as people of color, and 25% of senior leadership self-identify as people of color.

Legal and corporate services As EDF’s global presence expands, we will ensure that our infrastructure is working as effectively and efficiently

as possible; that we are adhering to local and national laws in diverse geographies; and that we have proactive plans to keep staff and their assets safe and protected everywhere they work or travel.

Information technology and facilities Powering a complex global organization requires top-notch systems, including a best-in-class information technology infrastructure that integrates data and users across the globe, while safeguarding their privacy and security. When it comes to facilities, our goal is to find the most innovative and cost-effective solutions while also reducing our environmental footprint, as in a recent reconfiguration of our New York headquarters that accommodates 20% more staff comfortably in the same space, with a more efficient design for lighting and heating to save energy and costs.

Finance Our finance team acts as a trusted adviser and business partner to organizational leaders, identifying opportunities for better allocating scarce resources, improving processes and reducing business risk. We are also examining all of our expenditures to ensure that we are maximizing cost savings and leveraging EDF's buying power. We will continue to hold ourselves accountable by using rigorous auditing and tracking processes to measure our return on investment and report outcomes to our donors and the public.



Transitions

Work we are phasing out

EDF is disciplined not only in choosing the work we do and doubling down on the work that's making good progress, but also in dropping approaches that aren't succeeding, or, in some cases, putting them on hold until the facts on the ground change in our favor. We are also careful to wrap up efforts that have attained their objectives and phase out work that is best suited to being carried forward by others. A few examples:

EPA and DOE clean energy and methane standards

We do not expect EPA Administrator Scott Pruitt or Energy Secretary Rick Perry to pursue transformative action on climate, clean energy or methane pollution, so we are redirecting resources that would have gone to regulatory design and realigning our EPA and DOE advocacy toward more productive channels, while remaining ready to re-engage when the opportunity returns. We are working through the courts to hold EPA accountable for failing to regulate methane pollution from existing oil and gas facilities, in order to keep the possibility of regulation on the horizon for oil and gas companies and their investors, and to ensure that the building blocks are in place for federal action at the earliest politically viable moment.

Clean Power Plan implementation With the Trump administration trying to dismantle the Obama-era Clean Power Plan, we are shifting focus away from Clean Power Plan implementation and toward protecting EPA's core legal authority and obligation to regulate greenhouse gas emissions, in order to maintain a carbon risk signal that shapes investments in the power sector. We will use the relationships we have developed with key state policymakers and power companies to work toward state carbon markets and carbon pollution limits—a critical part of the foundation for future federal action.

U.S. methane mapping With more than 20 million data points collected and 15 cities mapped in the United States, we will be winding down our methane mapping efforts in 2018. In the last five years, we have successfully demonstrated the scientific proof-of-concept for this project and scaled the methodology to develop a powerful leak abatement tool, providing actionable data for utilities, regulators and policymakers. Based on our project's methodology and recent collaborations, some of the largest U.S. utilities are now adopting advanced leak quantification technology and using leak size information to prioritize pipeline replacement. Industry now has momentum, so EDF's role is no longer needed.

Carbon offset markets for agriculture The value of offset credits is not sufficient to give growers an incentive to adopt practices that reduce fertilizer pollution. We are now focusing on data and science to measure environmental outcomes from the supply chain.

Construction and mining equipment EDF will curtail work on federal emissions standards for off-road construction and mining equipment.

Fish Forever Since 2012, EDF has partnered with the environmental group, Rare, and University of California, Santa Barbara, to improve small-scale fisheries. Our focus has been on providing technical expertise in curriculum development as well as on-the-ground capacity development in the Philippines and elsewhere, resulting in over a dozen communities advancing sustainable fishing. With EDF's contribution to the partnership fulfilled, we are ramping down our engagement and shifting our focus to other priority partnerships, such as with the Bureau of Fisheries and Aquatic Resources in the Philippines.



A critical moment

If we fail to cure the Earth's environmental ills, it won't be because we lacked the needed remedies. It will be because we failed to act in time.

The challenges may be daunting, but as we have seen throughout this strategic plan, a new wave of technological, civic and policy innovation has arrived at just the right moment to help build the powerful coalitions needed to drive effective action.

Technology is giving us better ways to measure pollution and understand its impacts. Civic innovation gives communities around the world new ways to communicate and collaborate. And policy innovation can hold laggards accountable while rewarding actions that protect the environment.

These innovations don't replace our well-honed tools of science, economics and law; they supercharge our toolkit. They give environmental organizations around the world more ways to work more closely with one another and with fishermen, farmers, business leaders, activists, scientists, government officials—indeed, people from all walks of life.

We are joined together by the vision of a healthier home for ourselves, for our children and for future generations. It is a vision all of us can share, regardless of age, nationality, occupation or political party.

Please talk with others you know, take action in your own community and support the organizations working toward these ambitious goals. Each time you do, you will help us take another step along the pathway to progress.

Summary of program objectives

Unless noted, all climate and air pollution objectives are for the year 2025, to align with some countries' commitments in the Paris Agreement, and all other objectives are for the year 2022.

Leadership

- Solutions are in place at the federal and state level that drive down greenhouse gas emissions, as a result of significant political support from people across the U.S. political spectrum.
- At the federal level and in targeted states, a diverse pro-environment majority supports environmental safeguards and protections for public health, supplying political power when needed to move forward on policies at either the executive or legislative level.
- There is a political cost to trying to tear down public health protections.
- A bench of new environmental champions has been elected in key states and at the federal level.



China

- Carbon emissions from major industrial sources are capped, and China's total carbon emissions peak by 2025, five years ahead of China's Paris Agreement target.
- Air quality improves across the country, including a 40% reduction from 2013 levels of fine particulate matter (PM 2.5) in the Beijing-Tianjin area by 2020.
- China is spearheading low-carbon development in the Belt and Road countries, by expanding its carbon market to those nations.

North America

- The United States has achieved a 26% to 28% reduction in greenhouse gas emissions (from a 2005 baseline).
- North America has reduced methane emissions from the oil and gas sector consistent with a 45% reduction in global methane emissions from that sector.

Europe

- Europe has increased its commitment under the Paris Agreement, pledging to cut emissions more than the originally promised 40% by 2030 (from a 1990 baseline).

- Carbon pricing is effective in reducing emissions across all sectors, including through the EU-ETS and through ICAO and IMO for international aviation and shipping.
- European countries and companies have made strong commitments to reduce methane emissions, consistent with achieving a 45% global reduction by 2025.
- Accelerated adoption of clean energy in all sectors has reduced carbon emissions (against a 2017 baseline) while allowing for strong growth in the economy.

India

- Be on track to achieve compliance with National Ambient Air Quality Standards for conventional pollutants by 2030, while building capacity to address climate pollution.
- A low-carbon rural development policy is established, with solutions including clean biogas stoves and low-carbon farming techniques adopted by ten million households in six states and an established pathway to national coverage.

Forests in Brazil and the Amazon

- Zero net carbon dioxide emissions from deforestation are achieved for Brazil and the entire Amazon.

Accelerating change

- Global methane emissions from the oil and gas sector are cut 45% from 2012 levels.
- Be on track for half of all global CO₂ emissions to be covered by durable, declining limits achieved with a carbon price by 2030.
- An improved understanding is achieved of technologies and practices that may be used to remove CO₂ from the atmosphere.



- Nearly a third of the world's catch is under policies or practices that make sustainable fishing the norm.
- Breakthrough collaborations and innovations in technology and science accelerate widespread adoption of sustainable fishing.
- Key fisheries in Asia, South America and Europe have robust systems in place to address climate change impacts, including species range shifts.



Build resilient coastal communities

- \$3.5 billion is being invested on an annual basis in the design or construction of sustainable natural infrastructure to reduce coastal risks.
- Community-based resilience planning is built into adaptation efforts in Louisiana as a model for the rest of the world. Learning from Louisiana’s adaptation experience is actively considered in three other U.S. areas and two areas outside the country.
- An adaptive management system for large-scale sediment diversion on the lower Mississippi River is in place, taking advantage of improved monitoring technologies.

Rebalance water systems

- Sustainable groundwater management plans that improve ecosystems and include water trading are being implemented in at least three groundwater basins.
- At least two major water deals to reduce water diversions from the Colorado River provide for farmers’ active participation in water markets and habitat restoration.
- Satellite-based measurement of agricultural water use is available at low cost through a web interface to farmers, water managers and others across the West.
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Wee, S. (April 24, 2014). China to impose tougher penalties on polluters under new law. Reuters. <http://www.reuters.com/article/2014/04/24/china-environment-idUSL3N0NG35Q20140424>

10 For more information on rebounding: National Oceanic and Atmospheric Administration, NOAA Fisheries. (2014). Status of Stocks 2013: Annual Report to Congress on the Status of U.S. Fisheries. NOAA Fisheries. http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/archive/2013/status_of_stocks_2013_web.pdf

Fewer discards: National Oceanic and Atmospheric Administration, NOAA Fisheries. (2013). The West Coast Groundfish IFQ Fishery: Results from 2012, the second year of catch shares. http://www.westcoast.fisheries.noaa.gov/publications/fishery_management/rawl_program/yr2-rpt.pdf

Fishermen are better off: Brinson, A. and Thunberg, E. (2013). The Economics Performance of U.S. Catch Share Programs. U.S. Department of Commerce, National Oceanic and Atmospheric Administration and National Marine Fisheries Service. http://www.st.nmfs.noaa.gov/Assets/economics/catch-shares/documents/Catch_Shares_Report_FINAL.pdf

Leadership

11 American Security Project works with EDF Action to elevate national security voices on climate issues. <https://www.americansecurityproject.org>

Citizens' Climate Lobby works with EDF to promote smart policy solutions to limit climate pollution. <https://citizensclimatelobby.org>

Congressional Hispanic Caucus Institute partners with EDF Action on outreach to the Latino community on environmental and health issues. <http://blogs.edf.org/energyexchange/2016/09/28/clean-energy-an-emerging-path-for-latino-communities>

Interfaith Power and Light and EDF are long-time partners in reaching out to faith communities on climate change and related issues. <https://www.ncchurches.org/2016/10/growing-a-partnership-with-environmental-defense-fund>

League of Conservation Voters and EDF Action work together to build political power for the environmental community and hold elected officials accountable. <https://www.lcv.org/article/lcv-edf-action-launch-significant-independent-expenditures-in-pennsylvania-senate-race>

League of United Latin American Citizens partners with EDF on issues of concern to the Latino community. <https://www.edf.org/climate/partnering-latino-health-and-environment>

Niskanen Center and EDF have collaborated on market-oriented policy development and outreach. <https://e360.yale.edu/features/climate-converts-the-conservatives-who-are-switching-sides-on-climate-change>

Natural Resources Defense Council and EDF are long-time partners across a wide range of environmental issues. <http://www.nrdc.org>

Truman National Security Project and EDF work together through Truman's Operation Free Campaign to give veterans and national security experts a platform on environmental and energy issues. <http://operationfree.net>

Young Conservatives for Energy Reform and EDF have collaborated on outreach to millennial conservatives to support stewardship of our natural resources and energy independence. <http://www.cleanenergycommitment.org>

Turning the corner toward a safe and stable climate

12 In 2016, the largest declines in coal consumption were seen in the United States (–8.8%) and China (–1.6%).

<https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review-2017/bp-statistical-review-of-world-energy-2017-full-report.pdf> (p.2)

13 Renewable power (excluding hydro) grew by 14.1% in 2016, the largest increment on record. <https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review-2017/bp-statistical-review-of-world-energy-2017-full-report.pdf> (p.2)

Lazard's Levelized Cost of Energy Analysis. https://www.lazard.com/media/1777/levelized_cost_of_energy_-_version_80.pdf (p.2)

Across America, states, cities, businesses, universities and citizens are taking action to fight climate change, grow the economy and protect public health. America's Pledge brings together private and public sector leaders to ensure the United States remains a global leader in reducing emissions and delivers the country's ambitious climate goals of the Paris Agreement. <https://www.americaspledgeonclimate.com>

14 https://www.eia.gov/outlooks/ieo/pdf/ieotab_10.pdf

Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States. <http://data.worldbank.org/indicator/EN.ATM.CO2E.KT?end=2012&start=2005>

15 World Energy Outlook 2015. <http://www.worldenergyoutlook.org/weo2015> (p.598–99) and (p.638–639)

16 Regarding GHG emissions, the Belt and Road countries are major emission sources as well as the primary regions with growing emissions. In 2015, the Belt and Road countries emitted 60.6% of the global CO₂ emissions (31.1% if China's excluded). From 2000–2015, the CO₂ emissions from the Belt and Road countries increased by 95.2%—more than twice the global average. Consideration and recommendations for promoting the construction of a low-carbon community among the Belt and Road countries. National Center for Climate Change Strategy and International Cooperation, 2015 (*in Chinese*)

17 http://www.iea.org/publications/freepublications/publication/CO2EmissionsfromFuelCombustion_Highlights_2016.pdf (p.12, figure 10. Note that this is from combustion which is the same breakdown as from fossil fuels.)

18 CO₂ data from Enerdata (fossil fuels and industry); International Energy Agency (aviation and maritime); Global Forest Watch, based on Baccini et al., (2017) (tropical deforestation and degradation); and Houghton, R.A. and Nassikas, A.A., 2017 (peat drainage and burning). These sources account for an estimated 95% of total emissions. Gross emissions from forest loss outside the tropics, estimated at approximately 3 billion metric tons annually, are not available by country and so are omitted from the calculation. Data are for 2015 except aviation and maritime, which are for 2014 (the latest available). Source: Baccini, A., Walker, W. Carvalho, L., Farina, M. Sulla-Menashe, D. and Houghton, R.A. 2017. "Tropical forests are a net carbon source based on aboveground measurements of gain and loss." *Science* doi:10.1126/science.aam5962. Houghton, R.A., and Nassikas, A.A. 2017. "Global and regional fluxes of carbon from land use and land-cover change 1850–2015." *Global Biogeochemical Cycles* 31:456-472. doi:10.1002/2016GB005546.

China

19 Energy Foundation: <http://www.efchina.org/Programs-en/CSCP-en>

WWF China: http://en.wwfchina.org/en/what_we_do/climate_energy/lc

Society of Entrepreneurs and Ecology: <http://www.see.org.cn/Foundation/Home> (*in Chinese*)

20 Bureau of Environmental Supervision, Ministry of Environmental Protection and EDF collaborate in strengthening China's environmental enforcement. <http://hj.mep.gov.cn> (*in Chinese*)

China Association for NGO Cooperation and EDF partner to support low-carbon development and carbon trading. <http://www.cango.org/en/index.aspx>

China Council for International Cooperation for Environment and Development and EDF work together to establish a sustainable environmental governance system in China. <http://www.cciced.net/cciceden/>

China Electricity Council and EDF collaborate on energy modeling and policy recommendations for power sector emissions reductions. <http://english.cec.org.cn>

Chinese Academy of Agricultural Sciences and EDF collaborate on policy research on poverty alleviation and carbon farming. <http://www.ieda.org.cn> (*in Chinese*)

Climate Department, National Development and Reform Commission and EDF work together to build capacity for establishing a national carbon market in China. <http://qhs.ndrc.gov.cn> (*in Chinese*)

Policy Research Center for Environment and Economy, Ministry of Environmental Protection collaborates with EDF on energy modeling and policy recommendations for control of carbon and conventional air pollutants. <http://www.prcee.org/en>

Poverty Alleviation Office, State Council and EDF work together to alleviate poverty in China through low-carbon development. <http://www.cpad.gov.cn> (*in Chinese*)

School of Law, Peking University and EDF partner on environmental enforcement and legislation improvement. <http://en.law.pku.edu.cn>

School of Public Policy and Management, Tsinghua University contributes to energy modeling and policy recommendations for cleaner energy development for EDF. <http://www.sppm.tsinghua.edu.cn/english>

Shanghai Environmental Protection Bureau and EDF work together to improve energy efficiency and green the supply chain. <http://www.sepb.gov.cn/fa/cms/shhj/index.htm> (*in Chinese*)

North America

21 The Greenlining Institute: <http://greenlining.org/issues-impact/energy>

The American Security Project: <https://www.americansecurityproject.org/issues/climate-security>

Bloomberg Philanthropies' partnership with Sierra Club: <http://www.bloomberg.org/program/environment/beyond-coal/#overview>

Green City Force: <http://www.greencityforce.org>

22 See for example: An act to amend Section 714 of the Civil Code, and to amend Section 65850.5 of the Government Code, relating to solar energy. Assemb. B 2188, 521 (Cal. Stat. 2014). http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB2188

North Carolina Utilities Commission. Docket No. E-100, SUB 83 In the Matter of Investigation of Net Metering. <http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=f1b29a03-4445-4930-9dfd-14682ceb368e>

23 In addition to EDF's regulatory advocacy, we are working to help open markets to investment in residential and commercial clean energy upgrades. <http://www.edf.org/blog/2014/04/18/depth-look-future-american-energy-and-how-we-get-there>

24 California, Illinois, North Carolina, New Jersey, New York, Ohio and Texas accounted for 34.6% of total U.S. electricity sales in 2015. <https://www.eia.gov/electricity/data/eia861>

25 *Untapped Potential: Reducing Global Methane Emissions from Oil and Natural Gas Systems*. https://www.edf.org/sites/default/files/content/rhg_untappedpotential_april2015.pdf (p.8)

26 EDF was a founding member of the Illinois Clean Jobs Coalition, a 300-organization environmental, consumer, labor and clean energy business pact that was instrumental in drafting the legislation. The yeoman work of negotiation was led by EDF, Citizens Utility Board (a ratepayer advocacy group), Sierra Club and NRDC.

27 *Untapped Potential: Reducing Global Methane Emissions from Oil and Natural Gas Systems*. http://rhg.com/wp-content/uploads/2015/04/RHG_UntappedPotential_April2015.pdf (p.2)

28 Center for Continuing Study of the California Economy (2017, July). California Remains the World's 6th Largest Economy, Could Pass the U.K. in 2017. <http://ccsce.com/PDF/Numbers-July-2017-CA-Economy-Rankings-2016.pdf>

California has expanded its statewide cap-and-trade system to include transportation fuels, linked it to similar markets in Quebec and Ontario, and extended it to 2030 with the aim of cutting greenhouse gas emissions 40% by 2030 (from 1990 levels).

EDF cosponsored California's landmark bipartisan climate bill, AB 32, and defended its provisions in the courts. AB 32 includes an innovative cap-and-trade market system to reduce greenhouse gas emissions. <http://www.edf.org/climate/california-climate-launch-pad>. In July 2017, legislation was signed extending the market through 2030, along with a companion bill that strengthens air quality monitoring in the neighborhoods most impacted by air pollution. It also modernizes air quality violation penalties that have not been updated for 35 years and accelerates the timeline for retrofits on industrial facilities that participate in the cap-and-trade program.

29 BlueGreen Alliance and EDF have partnered to push for stronger regulations to detect and repair leaks from natural gas pipelines in California. <https://www.bluegreenalliance.org/the-latest/bi-partisan-vote-approves-legislation-to-find-and-fix-natural-gas-leaks-in-california>

Citizens Utility Board and EDF work together to advocate for utility policies that benefit consumers in the Midwest through cost savings, better access to data and reduced emissions. <https://citizensutilityboard.org>

Clean Air Task Force is a partner in advocating reductions in methane and other air pollutants under our nation's clean air laws. <http://www.catf.us>

Climate Action Campaign, of which EDF is a leader, is a broad coalition of environmental and public health groups fighting to strengthen public support to defend clean air and climate progress. <http://www.actonclimate.com>

EarthJustice is a partner in enforcing and defending climate and clean air protections in complex litigation. <http://earthjustice.org>

GridWise Alliance, of which EDF is a board member, is the leading business forum engaging in federal and state advocacy for a smart, sustainable, modern electric grid. <http://www.gridwise.org>

Institute for Policy Integrity is a partner in mobilizing rigorous law and economics in high-priority legal and regulatory proceedings to protect human health and the environment. <http://policyintegrity.org>

Natural Resources Defense Council and EDF are partnering to defend clean air and climate progress through litigation and working to ensure EPA enforces and fulfills its duties under the Clean Air Act. <https://www.nrdc.org/issues/clean-us-power-plants>

The Nature Conservancy and EDF have formed a strategic alliance to advance climate solutions by accelerating the U.S. transition to clean energy and rebuilding the political center on climate. <https://www.nature.org/ourinitiatives/urgentissues/global-warming-climate-change/index.htm?intc=nature.tnav.ourwork>

Ohio Environmental Council advances energy efficiency and clean energy by advocating for a healthier, more sustainable state before the Public Utilities Commission of Ohio. <http://theoec.org/clean-energy/>

Pembina Institute, a leading Canadian think tank working to solve today's greatest energy challenges, and EDF are working to leverage our respective technical capacity, regulatory experience and political influence to secure robust methane regulations for new and existing sources that will curb methane emissions across Canada's oil and gas supply chain. <http://www.pembina.org/>

Pennsylvania Environmental Council is a critical member of a larger EDF-built coalition of Pennsylvania groups keeping outside pressure on state decision makers to adopt comprehensive methane regulations. <http://pecpa.org>

Stanford Precourt Institute for Energy and EDF are modeling impacts of policy changes, such as pricing, voltage optimization and renewables integration, on electricity systems in California and other states. <https://energy.stanford.edu>

Union of Concerned Scientists and EDF collaborate in the Midwest to forge common ground on clean energy policy changes among diverse stakeholders. <http://www.ucsusa.org>

Western Resource Advocates is a partner in decarbonizing the power sector across the intermountain West. <https://westernresourceadvocates.org>

The Wilderness Society and EDF are partners in our efforts to defend the BLM methane waste rule and putting methane on the agenda in New Mexico. <http://wilderness.org>

Wyoming Outdoor Council partnered with EDF to advocate stronger state regulations of oil and gas operations. <http://wyomingoutdoorcouncil.org>

Europe

30 Carbon Tracker: <http://www.carbontracker.org>

DeepMind: <https://deepmind.com/blog/deepmind-ai-reduces-google-data-centre-cooling-bill-40>

Agora Verkehrswende: <https://www.agora-verkehrswende.de>

European Environmental Bureau: <http://eeb.org>

31 Clean Shipping Coalition: EDF works with fellow founding NGOs of the Clean Shipping Coalition to improve the environmental performance of international shipping through the International Maritime Organization. <http://www.cleanshipping.org/about>

Green Business Certification Inc. is setting up certification processes based on the Investor Confidence Project protocols, developed by EDF to standardize energy efficiency investments in the building sector. <http://www.gbci.org>

International Emissions Trading Association works with EDF to promote effective implementation of emissions trading schemes around the world. <http://www.ieta.org>

Oil and Gas Climate Initiative is a CEO-led coalition of ten oil and gas companies representing over 20% of global oil and gas production, including six European companies. <http://www.oilandgasclimateinitiative.com>

Principles for Responsible Investment (PRI) partnered with EDF to develop the Investors Guide to Methane. Following its release in late 2016, PRI recently announced a collaborative oil and gas company engagement initiative that includes 35 investors from 11 countries representing \$3.8 trillion in assets. Investors will use the Guide to push companies to better measure, report and reduce emissions. <https://www.unpri.org/news/pri-and-edf-launch-practical-guide-to-help-investors-manage-methane-risks>

Sandbag Climate Campaign: EDF shares intelligence and analysis with the not-for-profit Sandbag Climate Campaign in relation to the EU Emissions Trading Scheme as we seek to increase Europe's ambition through more effective use of carbon trading policies. <https://sandbag.org.uk>

India

32 *The World in 2050*. The long view: how will the global economic order change by 2050? <http://www.pwc.com/world2050>

33 *World Energy Outlook 2015*. <http://www.worldenergyoutlook.org/weo2015> (p.598–99) and (p.638–639)

34 Half of world's 20 most polluted cities are in India, Delhi in 11th position. http://www.who.int/phe/health_topics/outdoorair/databases/cities/en

Air pollution claims one life every 18 seconds and 1.8 million deaths/year in India from ambient and indoor air pollution as reported by the GBD workgroup. Institute for Health Metrics and Evaluation (IHME). GBD Compare Data Visualization. Seattle, WA: IHME, University of Washington, 2015 <http://vizhub.healthdata.org/gbd-compare> (Accessed September 15, 2017).

<http://documents.worldbank.org/curated/en/781521473177013155/pdf/108141-REVISED-Cost-of-PollutionWebCORRECTEDfile.pdf>

<https://openknowledge.worldbank.org/bitstream/handle/10986/22048/Greening0India0tions0and0trade0offs.pdf>

35 Agriculture and land use account for about 30% of India's current mitigation potential. http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/Sustainability/PDFs/McK%20on%20SRP/SRP_08_India.ashx

36 Climate Parliament, a long-time EDF partner, is an important actor in accelerating clean energy and low-carbon rural development in India. <http://www.climateparl.net/asia>

Fair Climate Network and EDF partner to promote low-carbon rural development in India. <http://fairclimate.com>

Farms n Farmers Foundation, Fair Climate Network and EDF are working together to deploy climate smart agriculture in Bihar. <http://farmsnfarmers.org>

IndiGo Airlines: EDF helped broker an agreement between IndiGo Airlines and Fair Climate Network whereby airline customers can offset their emissions by purchasing offsets. https://www.edf.org/sites/default/files/indigo_goes_green_low-carbon_rural_development_feb2014.pdf

NITI Aayog has been working with EDF to help scale up the clean cooking program in two districts in two states. <http://niti.gov.in>

Public Health Foundation of India, The Energy and Resources Institute, Urbanemissions.info and EDF have been working on air quality issues in India. <http://www.teriin.org>; <http://www.phfi.org>; <http://www.urbanemissions.info>

37 Center for Science and the Environment: <http://www.cseindia.org>

Energy Efficiency Services Limited: <https://www.eesindia.org>

Energy Policy Institute of Chicago: <https://epic.uchicago.in/project/developing-indias-first-emissions-trading-scheme-2>

Shakti Sustainable Energy Foundation: <http://shaktifoundation.in>

Global Alliance for Clean Cookstoves: <http://cleancookstoves.org/about>

Forests in Brazil and the Amazon

38 Climate and Forest Capital and EDF collaborate on creating an innovative finance vehicle for accelerating a REDD+ compliance market. <http://www.climateandforest.com>

Coordinating Body for the Indigenous Peoples of the Amazon Basin is EDF's key indigenous partner in advocating good rules and policies for REDD in the United Nations Framework Convention on Climate Change process, REDD multilateral programs and Amazonian countries. <http://www.coica.org.ec> (*in Spanish*)

Instituto Socioambiental Xingu program and EDF collaborate in the protection and sustainable development of the indigenous territories and protected areas of the Xingu River basin. <https://www.socioambiental.org/pt-br/o-isa/programas/xingu> (*in Portuguese*)

ICV, IMAZON, IPAM and EDF partner in Brazil to create large-scale policy and incentive frameworks for zero deforestation supply chains in the Amazon states of Brazil. <http://www.icv.org.br>; <http://imazon.org.br>; <http://ipam.org.br> (*in Portuguese*)

39 The Nature Conservancy: <https://www.nature.org/ourinitiatives/regions/asiaandthepacific/indonesia/howwework>

World Resources Institute: <http://www.wri.org/our-work/project/global-forest-watch>

EAT Forum: <http://www.eatforum.org>

Norwegian Climate and Forest Initiative: <https://www.norad.no/en/front/thematic-areas/climate-change-and-environment/norways-international-climate-and-forest-initiative>

Acre State Incentive System for Environmental Services-SISA: <http://sisa.agisbrasil.com.br/#!/inicio> (*in Portuguese*)

Transportation

40 *Global Transportation Energy and Climate Roadmap*. <http://www.theicct.org/sites/default/files/publications/ICCT%20Roadmap%20Energy%20Report.pdf> (p.1)

41 *A Strategy for New Mobility in the U.S.*, draft report of the Hewlett Foundation, February, 2017.

42 <http://blogs.edf.org/climatetalks/2016/10/06/icaos-market-based-measure-could-cover-80-of-aviation-emissions-growth-in-mandatory-phase/>

43 <http://www.theicct.org/sites/default/files/publications/ICCT%20Roadmap%20Energy%20Report.pdf> (p.1)

Spotlight on business

44 EDF's corporate partnership work is funded by generous individuals and foundations. <http://www.edf.org/approach/partnerships/corporate-donation-policy>

45 EDF has worked with FedEx to develop a cleaner, more efficient delivery truck; with KKR to create the private equity firm's Green Portfolio Project; with McDonald's to cut packaging waste and later to reduce the use of antibiotics in poultry production; and with Walmart to reduce the environmental impacts of its operations and the products it sells. <http://business.edf.org>

Accelerating change

46 <https://www.iea.org/newsroom/news/2017/march/iea-finds-co2-emissions-flat-for-third-straight-year-even-as-global-economy-grew.html>

47 In 2006, EDF cosponsored AB 32, the California Global Warming Solutions Act, which authorized the creation of the state's groundbreaking cap-and-trade program. Since then, EDF has been instrumental in successful legal defense of the cap-and-trade auctions, a key feature of the program. In 2017, EDF worked to secure a bi-partisan extension of the cap-and-trade program until 2030; this measure passed with a supermajority vote, helping to protect the program from future legal challenges.

<http://next10.org/sites/next10.org/files/2016-california-green-innovation-index-1.pdf>

48 <http://documents.worldbank.org/curated/en/598811476464765822/pdf/109157-REVISED-PUBLIC-wb-report-2016-complete-161214-cc2015-screen.pdf> (p.80)

49 Climate Action Network: <http://www.climatenetwork.org/about/can-charter>

Risky Business Project: Michael R. Bloomberg, Henry Paulson and Tom Steyer co-chair the Risky Business Project: <http://riskybusiness.org/fromrisktoreturn>

Movebank: <http://www.orn.mpg.de/33343/Movebank>

50 This would have the same impact on the rate of climate change over 20 years as closing one-third of the world's coal plants.

51 When China launches its national carbon market—expected in late 2017—approximately 15% of the world's CO₂ emissions to be covered by a carbon price. Calculated based on Emissions Database for Global Atmospheric Research of EU's Joint Research Centre (<http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2015>), and research from Center for Energy & Environmental Policy Research of Beijing Institute of Technology, based on the eight industries covered by the carbon market, which account for around 50% of China's total CO₂ emissions. (Forecast and prospect of China's carbon market 2017). <http://edgar.jrc.ec.europa.eu/overview.php?v=CO2ts1990-2015>

52 Aviation Environment Federation (UK) is a key partner with EDF in the multi-NGO International Coalition for Sustainable Aviation and is engaging with forward-looking industry representatives and policymakers on the International Civil Aviation Organization's efforts to address carbon pollution from international flights. <http://www.aef.org.uk/issues/climate>

Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants is comprised of 55 nations and 62 non-state partners (including EDF). Its Oil & Gas Methane Partnership helps participating companies minimize methane emissions from oil and gas production and has companies report on their progress in reducing emissions from key methane sources. <http://www.ccacoalition.org/en>

Environmental Law Institute and EDF are working to advance and protect citizens' rights to acquire and disseminate environmental data and to integrate advances in environmental monitoring into environmental law and policy. <https://www.eli.org>

Green Business Certification, Inc. and EDF are launching and deploying the Investor Confidence Project, the first global standard for energy efficiency investment. <http://www.gbci.org>

The International Emissions Trading Association (IETA), a nonprofit business organization with 140+ members, supports the development of emissions trading systems that result in real and verifiable greenhouse gas emission reductions, while balancing economic efficiency with environmental integrity and social equity. <http://www.ieta.org>

The Center for Sustainability Studies of the Getúlio Vargas Foundation conducts carbon market simulations. EDF is a member of its technical advisory committee. <http://eaesp.fgvsp.br/en/teaching-knowledge/centers/ces> (in Portuguese)

Mario Molina Center is a Mexican nonprofit committed to finding practical, realistic and in-depth solutions to challenges related to environmental protection and promoting sustainable development. EDF worked with Molina Center to release research around the cost-effectiveness of reducing oil and gas methane emissions in Mexico. <https://centromariomolina.org>

Motu Economic and Public Policy Research is New Zealand's leading nonprofit economic and public policy research institute with globally valued expertise in carbon market design. <https://motu.nz>

Oil and Gas Climate Initiative is a CEO-led initiative made up of ten oil and gas companies which aims to show sector leadership in response to climate change. It is joining a scientific collaboration with EDF and the Climate and Clean Air Coalition to advance global methane science through a series of studies and is cultivating leadership actions on methane solutions. <http://www.oilandgasclimateinitiative.com>

Spotlight on science

53 In 2014, EDF staff identified four emerging areas as most important for EDF to pursue: considering ethnic and cultural diversity in environmental advocacy and outreach; expanding our use of social and behavioral science through different levels of analysis; harnessing big data and sensors for environmental benefits; and advancing the science of climate change attribution. <https://www.edf.org/science-driving-force-behind-edf>

Oceans

54 Food and Agriculture Organization of the United Nations. *Global Capture Production 1950–2015*. Downloaded and analyzed August 2017. <http://www.fao.org/fishery/statistics/global-capture-production/query/en>

55 Gaines, S. D., et al., (2017). *Fixing fisheries management could offset the negative effects of climate change*. In revision at *Science Advances*.

56 Marine Stewardship Council. (June 2014). *U.S. West Coast groundfish achieves MSC certification*. <https://www.msc.org/newsroom/news/u.s.-west-coast-groundfish-achieves-msc-certification>

Monterey Bay Aquarium Foundation. (Sept 2014). *Seafood Watch September 2, 2014 Updates*. <https://newsroom.montereybayaquarium.org/press/huge-improvement-in-seafood-watch-rankings-for-key-west-coast-fisheries>

57 NOAA Fisheries: Southeast Regional Office. (March 2013). *Red Snapper Overview*. http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/red_snapper/overview

58 Fujita, R., et al., (2017). *Scaling territorial use rights in fisheries (TURFs) in Belize*. *Bulletin of Marine Science*. 93(1):137–153. 2017. <http://www.ingentaconnect.com/content/umrsmas/bullmar/2017/00000093/00000001/art00011>

59 Global Fishing Watch: <http://globalfishingwatch.org>

Aquaculture Stewardship Council: <http://www.asc-aqua.org/index.cfm?act=tekst.item&iid=2&iids=385&lng=1>

Marine Stewardship Council: <https://www.msc.org/get-certified>

Monterey Bay Aquarium's Seafood Watch: <http://www.seafoodwatch.org>

60 Golden, C. (2016). *Fall in fish catch threatens human health*. *Nature*, 534, 317–320. <http://www.nature.com/news/nutrition-fall-in-fish-catch-threatens-human-health-1.20074>

61 Althelia Ecosphere is a conservation-based impact investment manager working with EDF to drive investment in sustainable fisheries. <https://althelia.com/althelia-climate-fund/sustainable-ocean-fund>

EDF is collaborating with the China Society of Fisheries to support sustainable fishing initiatives in China. <http://www.csfish.org.cn/csf/ah5/showInfo.asp?id=1746> (in Chinese)

The Atkinson Center for a Sustainable Future at Cornell University partners with EDF to support adaptive fisheries management in the Philippines, Myanmar and Peru, and financing for sustainable fisheries management. <https://www.atkinson.cornell.edu>

The Nicholas Institute for Environmental Policy Solutions and the Nicholas School of the Environment at Duke University and EDF are working to research and support sustainable fishing opportunities. <https://nicholasinstitute.duke.edu>

EDF works in partnership with the United Nations FAO to promote sustainable fisheries management practices around the world. <http://www.fao.org/fishery/en>

The University of the Philippines Visayas collaborates with EDF to foster support for sustainable fisheries in the Philippines. <http://www.upv.edu.ph>

The Wildlife Conservation Society partners with EDF to develop and implement innovative solutions for healthy fisheries in Belize, Myanmar, Cuba and elsewhere. <https://www.wcs.org/our-work/solutions/oceans-and-fisheries>

WWF partners with EDF in developing and implementing fisheries innovations in Spain, Indonesia and elsewhere. WWF Spain and EDF have a formal collaboration with the goal of improving fishermen's livelihoods and protecting marine ecosystems by transforming Spanish coastal fisheries to sustainable fishing practices. <http://www.wwf.es> (*in Spanish*)

Ecosystems

62 The current world population of 7.3 billion is projected to reach 8.5 billion by 2030, 9.7 billion in 2050 and 11.2 billion in 2100. Source: United Nations Department of Economic and Social Affairs. World Population Prospects: The 2015 Revision. <http://www.un.org/en/development/desa/news/population/2015-report.html>

63 Source: Hinkel, J., Lincke, D., Vafeidis, A.T., Perrette, M., Nicholls, R.J., Tol, R.S., Marzeion, B., Fettweis, X., Ionescu, C. and Levermann, A., 2014. Coastal flood damage and adaptation costs under 21st century sea-level rise. *Proceedings of the National Academy of Sciences*, 111(9), (p.3292–3297) <http://www.pnas.org/content/111/9/3292.full>

64 Agriculture covers 38% of the Earth's surface. Source: Foley, J.A., Ramankutty, N., Brauman, K.A., Cassidy, E.S., Gerber, J.S., Johnston, M., Mueller, N.D., O'Connell, C., Ray, D.K., West, P.C. and Balzer, C., 2011. Solutions for a cultivated planet. *Nature*, 478(7369), (p.337–342) <http://yimg.com>

Agriculture is the biggest consumer of freshwater. "Agricultural water use was calculated to be 98% of global water use, with 20% of that used for agricultural products in international trade." Source: Hoekstra, A.Y. and Mekonnen, M.M., 2012. The Water Footprint of Humanity. *Proceedings of the National Academy of Sciences*, 109(9), (p.3232–3237) <http://www.pnas.org/content/109/9/3232.full.pdf>

65 Presently about 40% of the world's population lives within 100 kilometers of the coast. As population density and economic activity in the coastal zone increases, pressures on coastal ecosystems increase. Source: United Nations Department of Economic and Social Affairs. http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/oceans_seas_coasts/pop_coastal_areas.pdf

66 USGS: *Land area change in coastal Louisiana (1932 to 2016)*. Brady R. Couvillion, Holly Beck, Donald Schoolmaster, and Michelle Fischer. <https://doi.org/10.3133/sim3381>

67 Coalition to Restore Coastal Louisiana drives bold, science-based action to rebuild coastal Louisiana through outreach, restoration and advocacy. <http://www.crcl.org>

Lake Pontchartrain Basin Foundation focuses on science and restoration in the Lake Ponchartrain Basin of southeast Louisiana. <http://www.saveourlake.org>

National Audubon Society focuses on bird habitat and science relative to the Delta. <http://www.audubon.org/conservation/project/coastal-stewardship-gulf>

National Wildlife Federation brings habitat science, public education and experience to the coastal effort. <https://www.nwf.org/en/Our-Work/Waters/Great-Waters-Restoration/Mississippi-River-Delta>

The Nature Conservancy's NatureVest program is funding EDF to design the first environmental impact bond for wetland restoration. <https://www.edf.org/ecosystems/environmental-impact-bond-feasibility-study>

Restore or Retreat works with EDF to identify, expedite and aggressively engage solutions to achieve comprehensive coastal restoration in Louisiana. <https://restoreorretreat.org>

68 The Water Institute of the Gulf: <http://www.thewaterinstitute.org>

Greater New Orleans, Inc.: <http://gnoinc.org/initiatives/gno-inc-initiatives/ccre>

The Association of State Floodplain Managers: <http://www.floods.org>

69 40% of the world's total land area is considered to be drylands (according to the United Nations Convention to Combat Desertification classification system). Drylands are inhabited by more than 2,000 million people, nearly 40 percent of the world's population (White and Nackoney, 2003). Source: Food and Agriculture Organization of the United Nations. <http://www.fao.org/docrep/012/i0372e/i0372e01.pdf>

70 Sustainable Groundwater Management Act: <http://www.water.ca.gov/groundwater/sgm>

71 American Rivers and EDF are collaborating to address the long-term water imbalance on the lower Colorado River. <https://www.americanrivers.org/region/southwest>

Audubon California and EDF are working with other interests to ensure that water management in the Imperial Valley of Southern California protects public health and provides critical habitat for migratory birds. <http://ca.audubon.org/landing/water>

Friends of Verde River Greenway is a partner with EDF in developing the "Verde River Exchange," a water offset program aimed at protecting flows and promoting sustainable economic development in Arizona's Verde River Valley. <https://www.verderiverexchange.org>

NASA and the Desert Research Institute are working with EDF to develop a web-accessible platform for low-cost reliable access-for-all to agricultural consumptive use information. <https://appliedsciences.nasa.gov>; <https://www.dri.edu>

Rural Community Assistance Corporation and Self Help Enterprises are partnering with EDF on a series of bilingual workshops in California to help rural water board leaders become better advocates for their water-stressed communities. <http://www.rcac.org>; <https://www.selfhelpenterprises.org>

Yuma County Water Users Association and EDF are working to advance Arizona water policies that help to stabilize Lake Mead elevations and begin to address the Lower Basin structural deficit. <http://www.ycwua.org>

72 Sustainable Conservation: <http://suscon.org/project/groundwater-recharge>

Western Resource Advocates: <https://westernresourceadvocates.org/healthy-rivers-lakes/protecting-colorado-river>

Texas Living Waters Project: <http://texaslivingwaters.org>

73 Dirzo, Rodolfo et al., (2014). Defaunation in the Anthropocene. *Science* Vol.345, pp.401–406. <http://science.sciencemag.org/content/345/6195/401>

74 Foley, Jonathan A. et al., (2005). Global Consequences of Land Use. *Science* Vol.309, p.570. <http://science.sciencemag.org/content/309/5734/570>

75 Colorado Cattlemen's Association and EDF are working on development of the Colorado Habitat Exchange and conservation efforts in the sagebrush steppe. <https://www.coloradocattle.org>

Environmental Incentives helps EDF develop habitat exchange programs and tools to measure habitat quality. <http://enviroincentives.com/practice-areas/wildlife-land> EDF is collaborating with the National Audubon Society to protect the Endangered Species Act and other critical federal and state environmental laws. <http://www.audubon.org>

EDF works with the University of Minnesota Monarch Lab to ensure strong science in our Monarch Habitat Exchange. <https://monarchlab.org>

76 Defenders of Wildlife: <http://www.defenders.org/endangered-species-act/endangered-species-act>

The Nature Conservancy: <https://www.nature.org/?redirect=https-301>

Wildlife Conservation Society: <https://www.wcs.org>

77 Nutrient balance is the difference between the amount of nutrients going onto the farm, from fertilizers and manure, and that being taken off through harvesting of the crop. The higher the surplus of nutrients, the more losses are likely to occur through runoff into water or conversion into nitrous oxide, a potent greenhouse gas.

78 As a member of Field to Market: The Alliance for Sustainable Agriculture, EDF is working collaboratively with diverse stakeholders to define, measure and advance the sustainability of food and fiber production in the United States. <http://www.fieldtomarket.org>

EDF enlists the National Corn Growers Association's collaboration on policy, positioning tools such as NutrientStar (<http://nutrientstar.org>) with growers and informing our strategy to apply nutrient balance. EDF is also a partner on the NCGA-led Soil Health Partnership. <http://soilhealthpartnership.org>

EDF is working with Smithfield to reduce greenhouse gas emissions in its feed supply chain and pork operations. <https://www.edf.org/media/smithfield-foods-cut-greenhouse-gas-emissions-25-percent>

EDF is working with Walmart to reduce the company's greenhouse gas emissions, in particular by focusing on fertilizer use in its supply chain. <http://corporate.walmart.com/global-responsibility/environment-sustainability/sustainable-agriculture>

79 The Nature Conservancy: <https://www.nature.org/ourinitiatives/urgentissues/land-conservation/global-agriculture/rethink-soil-a-roadmap-to-us-soil-health.xml>

World Wildlife Fund: <https://www.worldwildlife.org/initiatives/food>

Environmental Working Group: <https://www.ewg.org/tapwater/#.WaB6yCiGNPY>

Health

80 EDF's collaboration with Walmart has helped the company launch a sustainable chemicals policy that targets about ten chemicals of concern in consumer products for replacement with safer ingredients. <http://www.edf.org/health/walmart-partnership-leads-safer-products>

81 American Water Works Association and EDF work together to accelerate the removal of lead service lines around the country as founding members of the Lead Service Line Replacement Collaborative. <http://www.lslr-collaborative.org/about-us>

EDF works with the Chemical Footprint Project to encourage more companies and retailers to take meaningful steps to reduce toxic chemicals in their products and supply chain. <http://www.chemicalfootprint.org>

Children's Environmental Health Network and EDF work together to raise awareness and action among the public health community on prioritizing removal of lead service lines around the country. <http://cehn.org/about>

Earthjustice and EDF work together to develop legal strategies on a variety of environmental health issues ranging from defending the new Toxic Substance Control Act (TSCA) and strengthening policies to improve the safety of chemicals in food. <https://earthjustice.org>

Elevate Energy and EDF work together to develop practical solutions to reduce lead in drinking water at the local level, including lead service line replacement and faucet replacement in child care centers. <http://www.elevateenergy.org>

Walmart and EDF partner to drive use of safer chemicals in consumer products. <http://www.walmartsustainabilityhub.com/sustainable-chemistry>

82 Woodruff, T.J., Zota, A.R. and Schwartz, J.M. (June 2011). Environmental chemicals in pregnant women in the United States: NHANES 2003-2004. *Environmental Health Perspectives*. 119(6): pp.878–885. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3114826>

83 Institute for Health Metrics and Evaluation (IHME). GBDCCompareDataVisualization. Seattle, WA: IHME, University of Washington, 2016. <https://vizhub.healthdata.org/gbd-compare/>. (Accessed August 29, 2017)

84 Institute for Health Metrics and Evaluation (IHME). GBDCCompareDataVisualization. Seattle, WA: IHME, University of Washington, 2016. <https://vizhub.healthdata.org/gbd-compare/>. (Accessed August 29, 2017)

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85 OECD (2016), *The Economic Consequences of Outdoor Air Pollution*, OECD Publishing, Paris.

<http://dx.doi.org/10.1787/9789264257474-en>

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Engl, N. and Med, J. (March 23, 2017). 376(12):1182-1188.

EPA air trends report. <https://gispub.epa.gov/air/trendsreport/2016/> (Accessed August 29, 2017)

87 The NAAQ issued in 2009 requires the daily and hourly pollutant standards be met 98% of the days in a year, with noncompliance not exceeding two consecutive days.

88 Google Earth Outreach: EDF has used Google Street View cars to map air pollution at a granular level, providing communities with high quality maps of air pollution in their neighborhoods, increasing awareness of air pollution and its health effects, and catalyzing actions and advocacy to limit emissions. <https://www.google.com/earth/outreach/special-projects/air-quality>

Harvard Environmental Law Program: EDF works with the Emmett Environmental Law and Policy Clinic at Harvard Law School to identify and develop strategies to protect the integrity of science in decision making at EPA and other federal agencies, as well as to promote transparency and accountability through open records requests. <http://hls.harvard.edu/dept/clinical/clinics/emmett-environmental-law-and-policy-clinic>

One Breath Partnership: EDF leads a partnership of six organizations operating in the Houston area that is raising public awareness and dialogue about air quality and promoting clean air solutions.

Rice University: We have partnered with scientists at Rice University to study, measure and map the air quality in Houston and its impacts on the health of the communities living there. Rice has also been a key partner in an air quality awareness campaign led by EDF that focuses on strategies for effectively communicating scientific information about air quality and health to the media and the public. <https://kinder.rice.edu/UrbanData>

89 Silent Spring Institute: <https://silentspring.org/detoxme>

Clean Air Task Force: <http://www.catf.us>

Learning Disabilities Association: <https://ldaamerica.org/healthy-childrens-project>

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