

Catching up!

**EDF drives progress on electric trucks,
zero-emission cars and cleaner air travel.**

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CLOSER THAN THEY APPEAR

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an Adirondack
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cities prepare
for floods

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in to save the
monarch



Adirondack awakening

Thirty-two years after acid rain left Lake Colden sterile, brook trout have returned to this 41-acre body of water in the Adirondack High Peaks Wilderness of New York State. This is the first time that a self-sustaining fish population has been discovered in a once-barren high Adirondack lake without stocking. The reason? The 1990 Clean Air Act amendments, which used EDF's incentive-based approach to cut sulfur dioxide pollution from power plants.

The road to a 100% clean economy



As we enter a new decade, the reality of climate change is hitting home. Cutting climate pollution will always be Job One at EDF, but we're working to build climate resilience as well. Recently, EDF traveled with a group of farmers and state officials going from storm-battered North Carolina to Iowa to learn how another state copes with extreme flooding. It was part of EDF's growing effort to bring together communities grappling with climate change (*see p. 16*).

Limiting climate change is a daunting task. Global emissions are still on the rise, but I'm encouraged by some recent developments. Young people around the world, who have the greatest stake in the future, are bringing new energy and passion to the cause. They understand the urgent need for action. In the U.S., cities and states are stepping up as never before to do their part.

In Washington, D.C., too, legislators are beginning to wake up. In late November, the 100% Clean Economy Act was introduced in the House with the support of more than 150 co-sponsors — and EDF. It's a bold plan to slash climate pollution to net zero by 2050 at the latest, which is the ambitious but achievable climate goal we need.

We've made good progress in the U.S. electric power sector: emissions are down over the past decade as coal-burning power plants close. But we can't get to an economy that's 100% clean without going further on electricity and addressing every source of climate pollution, including transportation, now the country's number one source (*see cover story, p. 9*).

We're off to a good start. In 2018, the global electric car market was 5.1 million, up 2 million from 2017. And EDF is working with citizens, utilities and governments to rapidly expand deployment of electric trucks and buses. This is critical because trucks are among the fastest-growing pollution sources globally.

Airplanes and ships will also be getting cleaner. The International Civil Aviation Organization has agreed to cap carbon emissions from international flights beginning in 2021, with more than 80 nations participating. EDF played a key role in negotiations, and we're now pressing for further cuts. These achievements are helping us chart our course for 2020 and beyond.

But we're facing strong headwinds from the Trump administration, in the form of furious efforts to roll back popular clean car standards for automobiles. EDF and other environmental groups are fighting in the courts to protect the standards. But to prevail, the environmental community will need all our members to pitch in and join the fight.

Fred Krupp
EDF President



Finding the ways that work

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

Our work is made possible by the support of our members. Donate online at edf.org/newsletter or by mail: EDF, Attn.: Member Services, 1875 Connecticut Ave. NW, Ste. 600, Washington, DC 20009



On the cover:

At 29%, transportation has outstripped power generation as the nation's largest source of greenhouse gases and the biggest contributor to climate

change. In a special transportation feature, EDF writers Rod Griffin, Tasha Kosviner and Charlie Miller examine how America moves by road, air and sea, and report on the real progress being made toward a cleaner future.

COVER COMPOSITE: ALAMY & 123RF PHOTO

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FIELD NOTES

ROB SACHAR



The ruling saves important conservation lands.

Court blocks unnecessary pipeline

EDF's battle against unnecessary pipelines was aided by a federal court decision that halted a key pipeline. The \$1.6 billion, 120-mile PennEast pipeline would have crossed valuable state conservation lands to bring natural gas from Pennsylvania to New Jersey. It would have cost consumers \$130–\$230 million per year, according to PennEast. It also could have locked in decades of climate pollution. The court ruled for New Jersey that developers could not grab land.

PennEast is one of several pipelines that EDF is fighting. In some projects, the pipeline developer and the utility

signing contracts to use it are owned by the same company, which shifts the financial risk of building a pipeline from investors to consumers. The Federal Energy Regulatory Commission has approved several such projects without a rigorous analysis of whether a new pipeline is truly needed. "Pipeline investors should beware of these unnecessary projects," says N. Jonathan Peress, EDF's senior director for energy markets.

EDF is also advocating federal reforms that will tighten requirements for new pipelines and help speed up the transition to a 100% clean economy.



JIM DEWITT

A reprieve for the sage grouse

A federal judge has blocked the Trump administration's plans to allow expanded drilling and mining across 51 million acres of greater sage grouse habitat in the West. The judge ruled that the administration failed to use adequate science in analyzing how the imperiled bird would be affected. EDF helped develop the science for a now-dormant multistate plan to protect the bird. We hope the court victory can reinvigorate it.



GETTY

A task force for safer baby food

The last place you want to find heavy metals is in baby food. But in 2017, an EDF report revealed that 20% of baby foods contain traces of lead. This is deeply troubling because heavy metals like lead, even at very low levels, can reduce IQ in children. After our report was published, Consumer Reports conducted its own investigation. Cornell University and EDF then co-founded the

Baby Food Council to find the source of the metals and find ways to reduce the contamination. Also on the Council are the nonprofit Healthy Babies Bright Futures and leading manufacturers, representing 85% of the U.S. baby food market. Technical advisers are the U.S. Food and Drug Administration, the U.S. Department of Agriculture and the American Academy of Pediatrics. Stay tuned.

Why we work on sustainable fisheries



1 in 5 people
depend on fish as a primary source
of animal protein



100s of millions
rely on fishing for their livelihood



85% of fisheries
will be depleted by 2030 if we fail to act

SOURCES: UNITED NATIONS, FAO AND WHO



POWERFUL ALLIES

Trump wants to gut safeguards on oil and gas emissions. But look who's not on board!



Oil and gas giants BP, Equinor, Exxon and Shell



12 of America's biggest utilities



Global investors representing \$5.5 trillion in assets



The call of the rainforest

In the Indonesian rainforest, a treetop surveillance system uses recycled cell phones powered by solar panels and artificial intelligence software to detect activity by rogue loggers and send instant alerts to rangers. The project, by the California nonprofit Rainforest Connection, illustrates the promise of low-cost technology in the fight against deforestation.



FILIPRIKEN/DOUGLAS

Belize protects a precious reef

The Mesoamerican Reef — the largest barrier reef in the Western Hemisphere — hugs the Belizean coast and supports nearly 500 species of fish. Many residents depend on the reef for their survival, but overfishing has taken a heavy toll.

Belize is expected to pass a new national, multispecies fisheries law soon that will build on a decade of progress. In 2008, we teamed up with the Wildlife Conservation Society and local partners to enlist fishermen, policymakers and managers in pilot projects to preserve the reef by reducing the threat of overfishing. Local fishermen were granted rights to fish in a des-

ignated area and have become stewards of their fisheries. In just a few years, fish populations began to rebound and illegal fishing dropped 60%.

That success helped lead to the rolling out of the system nationwide. Coupled with the recent tripling of the size of marine protected areas, it will help further curb overfishing and protect the sensitive reef.

“EDF has worked closely with Belize to rebuild its fisheries, and now we are keen to explore how those lessons can be shared with other small island and coastal states around the world,” says Ambassador Janine Coye Felson, deputy chair of the Alliance of Small Island States.

IN THE COURTS

EDF and our allies recently won an important decision when a federal court supported the “Good Neighbor” rule of the Clean Air Act. The rule protects states from air pollution blowing in from states upwind. An astounding 141 million Americans are still affected by air pollution that comes from neighboring states. That’s unacceptable.

In October, EDF filed suit challenging the Food and Drug Administration decision to allow the continued use of perchlorate, a potent neurotoxin, in plastic packaging and food processing equipment. Through these uses, perchlorate can get into dry food, such as children’s cereal. FDA relied on flawed reasoning in its decision while ignoring evidence developed by its own scientists, which revealed serious risks from the use of perchlorate.

GREEN AND HAPPY



People who take steps to reduce their environmental impact are

11-13% happier than those who don’t.

SOURCE: NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY

Coloradans bet on saving water

In a victory for Western water, Colorado voters in November approved a ballot measure legalizing sports gambling that will allocate up to \$29 million a year in tax revenue to support conservation, river health and agriculture.

“It’s a big win for Colorado rivers,” says EDF’s Brian Jackson. Winning

passage took strong bipartisan support, uniting conservationists, outdoors lovers, businesses and farmers to pass the measure. Jackson was instrumental in bringing the parties together and ensuring that revenue from

the measure goes to water projects. It’s only the third time Coloradans have voted to tax themselves in the last 27 years.





ALAMY

In the heartland, clean energy shines

By Shanti Menon

Fossil fuel-dependent states and utilities in the West and Midwest are finding their own path to world-class climate leadership. They're also setting the stage for federal action to achieve a 100% clean economy.

AT A PUBLIC LIBRARY ON Chicago's west side, Andre White sits with a dozen men and women, listening intently as a banker discusses how to qualify for small business loans. It's compelling information for these entrepreneurs, who are taking part in a workshop run by a local nonprofit, Elevate Energy, to help minority business owners get a piece of Illinois' rapidly growing solar market. "This is the first time," says White, a general contractor turned solar installer, "that I have an opportunity to get in on the ground floor of something big."

Illinois added 1,300 solar jobs in 2018, a 37% surge driven largely by the state's landmark Future Energy Jobs Act, which EDF helped pass. Now the state is set to expand on that law with the most comprehensive package of climate legislation in the country. The Clean Energy Jobs Act will increase renewable energy, boost

electric vehicles and ensure that all communities benefit from the transition to a cleaner economy. EDF co-founded a huge coalition of consumer groups, utilities, labor and environmental justice partners to back this sweeping set of reforms, which is predicted to generate \$39 billion in private investment by 2030.

"People have had a taste of what clean energy can do for Illinois," says EDF Midwest Clean Energy Director Dick Munson. "That's why there's such strong support to expand these programs. We're confident the legislature will come through this spring and make Illinois a climate leader."

Trump's rollbacks have not impeded climate momentum across the country. States like Colorado and Pennsylvania and major utilities like Xcel Energy are also taking climate action that is helping set the stage for federal climate legislation. EDF worked with leaders in the U.S.

House of Representatives to introduce a climate bill that will transition the country to a 100% clean economy — one that produces no more pollution than we can remove — by 2050. It's an ambitious plan, but it's in line with what scientists say the world needs to do in order to avoid the worst impacts of climate change. More than 150 lawmakers have co-sponsored the 100% Clean Economy Act.

Colorado comes up big

Colorado made history in May 2019 when it passed a law mandating a 90% cut in climate pollution across its



ALAMY

A commitment to cut methane in New Mexico will also reduce ozone and smog.

economy by 2050 and at least 50% by 2030. EDF fought hard for this law, finding champions in the legislature and building a diverse coalition of health, community and business organizations that proved unstoppable. “States have to take the lead on climate,” says House Speaker KC Becker, a catalyst behind the bill. “EDF helped Colorado deliver on that promise.”

Colorado’s progress will be aided by a commitment from Xcel Energy, a utility EDF has long worked with to cut pollution, to go carbon-free by 2050, as well as Xcel’s support for a state law that requires them to cut climate pollution from their system 80% by 2030. Xcel operates in eight states in the West and Midwest.

Duke Energy, one of America’s largest utilities, with 7.7 million customers in the South and the Midwest, as well as Michigan’s DTE Energy, plan to cut their carbon pollution 50% by 2030 and reach net-zero by 2050. These three utility commitments will create a yearly climate benefit by 2050 equivalent to closing 45 coal-fired power plants, according to EDF’s calculations.

The momentum keeps rolling. EDF helped persuade Pennsylvania, one of the largest climate polluters in the U.S., to develop a plan to cap emissions from power plants. And New Mexico, which overlies part of the Permian Basin, the world’s top oil-producing region, has committed to at least a 45% reduction in climate pollution by 2030.

EDF is working with New Mexico’s governor, Michelle Lujan Grisham, to develop strong rules to meet that target, including curbing the state’s oil and gas methane pollution. “EDF’s expertise has been instrumental in our efforts to fight climate-polluting methane,” says Lujan Grisham.

Progress in places like these makes it clear that climate leadership is not limited by geography or long-standing links to fossil fuels. States, businesses and communities across the country are seeing the benefits of a clean economy that cuts pollution and creates prosperity.

The Midwestern climate leader

Illinois’ Clean Energy Jobs Act will grow the state’s renewable electricity supply to 46% by 2030 and 100% by 2050. (The current target is 25% by 2025.) It will improve energy efficiency in buildings and offer incentives for electric buses and charging stations for cars and trucks. It will remove

a subsidy that keeps dirty coal power plants — often in low-income neighborhoods — online. Other provisions will help protect displaced fossil fuel workers and expand clean energy job training.

Instead of being rewarded for selling more energy, utilities will get paid for improving efficiency and reducing consumer demand during peak hours. This lays the groundwork for a clean, flexible grid that can accommodate a rise in electric vehicle charging and even the use of EVs as batteries to store clean energy.

“We’re taking a holistic view of the evolution of energy and transportation,” explains EDF attorney Christie Hicks. “They need to get cleaner together.”

Hicks’ expertise in electricity markets is helping break down opposition from utilities. “Utilities are starting to understand that this is the future,” she says. “Ultimately, the reason these bills have such broad support is they capture benefits for every person in multiple ways. Your air will be cleaner, your energy bill will be lower and your community will have more opportunities.”

White, for one, is looking forward to those opportunities. “Renewable energy is saving the planet,” he says. “I’m learning how my business can be an integral part of this growth. I’m thinking this is my legacy.”



EDF helped recruit over 150 co-sponsors for the 100% Clean Economy Act, currently before the House of Representatives.



Riding the wave

Chris Williams, a third-generation electrician and business owner from Calumet City, Illinois, fell in love with solar energy 20 years ago. He had to travel far from home to get solar work, but it was more about passion than profit. “I loved it, but it wasn’t paying the bills,” says Williams.

Things changed after the passage of Illinois’ Future Energy Jobs Act in 2016. Williams, with decades of experience in an industry where just 8% of the workforce is black, suddenly had a new opportunity for local work as a trainer. At his Millennium Solar Electric Training Academy, he’s now conducted solar workshops for more than 150 people from underprivileged backgrounds. Some are now working as foremen, inspectors and salespeople for Sunrun, ComEd and other companies.

As Illinois expands its clean energy program with EDF’s help, the state will include more job training and opportunities for low-income communities to use solar energy. “It’s my job to help people understand that these laws are talking about us,” says Williams. “Once they understand that, their eyes open up.”

Williams recently purchased a building to expand his training school and meet his goal of training 1,000 students. “One thing that makes me more proud,” he says, “is when I get a call from a student telling me that before my training they didn’t have a future. Now they’re a leader or a foreman in a large company. That gives me joy.”

Rebuilding his island

After living through Hurricane Maria, a former EPA attorney and Puerto Rican energy official joins EDF to help realize a bold plan to stormproof the island's power grid.

THE NIGHT BEFORE HURRICANE Maria made landfall in Puerto Rico in 2017, the wind gusts outside Agustín Carbó's high-rise in San Juan had already reached 100 miles per hour. "The noise was unbearable," says Carbó. "I thought everything was going to be sucked out of my apartment window." Carbó was lucky. The hurricane killed nearly 3,000 people and destroyed Puerto Rico's rickety power grid. Carbó waited two months for his power to be restored, but others in rural communities in the center of the island were deprived of power for nearly a year.

"I hope to never live through that again," says Carbó, who's now working for EDF to modernize Puerto Rico's power system and protect its communities from future storms. Around the world, low-income communities are hit hardest by the ravages of climate change.

According to the United Nations, climate disasters may push an additional 120 million people into poverty by 2030.



The path Puerto Rico takes to clean energy could serve as a model for developing countries as they seek to modernize electricity service and grapple with climate change.

Carbó, a former senior attorney for the EPA in Dallas, created the agency that governs Puerto Rico's energy industry and set up the first rules to decentralize its electric grid — making it easier to bring more wind and solar energy into the electric system. "Climate change was always a priority for me," he says. "But when I came back to Puerto Rico to serve in the government in 2013, not many people were talking about it."

Hurricane Maria changed all that. "Now everybody's talking about climate change," says Carbó. "Everyone knows there will be another storm. They are ready for solutions."

Microgrids — small energy networks that can run a building or a neighborhood using local power instead of relying on lengthy transmission lines — can provide low-carbon, reliable electricity even if the main grid fails. In Puerto Rico (as well as wildfire-stricken California), several communities have turned to microgrids to provide

emergency power. But to be successful around the world, microgrids need a flexible utility system and sustainable financing. "Some communities had bad experiences with outside groups that didn't deliver," explains Carbó. "EDF is doing deeper work. We want to build a system that lasts." In addition to supporting a community-led microgrid project, EDF is helping Puerto Rico develop a long-term energy plan and financing that will allow more microgrids to flourish.

In January, Carbó represented EDF at a hearing on Puerto Rico's proposed 20-year plan to modernize its grid. "We want to make sure the plan includes more renewable energy and aligns with the development of microgrids," says Carbó. "Right now it doesn't do enough to help Puerto Rico reach its goal of 100% clean electricity by 2050." EDF is also advocating a new rule that would allow people to generate their own electricity and sell any excess to another customer, making microgrids more attractive financially.

Listening to community needs is essential, says Carbó, who travels frequently to the interior of the island. "It's one of the beauties of this job," he says. "In Puerto Rico, whenever you meet someone, you are like family. If you go to their house, they give you breakfast; it doesn't matter what their income level is. I love that."

"I feel a responsibility on my shoulders to make sure that what we do is helping people. This is a historic time to be working in Puerto Rico."

Shanti Menon



A battered Puerto Rico opts for a cleaner, more resilient grid.



Up, up and away

With transportation now the largest source of climate pollution in the U.S. and a leading cause of unhealthy air, a rapid transition to clean transport is essential. The following pages are a roadmap to how EDF is getting this done.



Electric trucks pick up speed

By Tasha Kosviner

Switching from diesel to electric trucks and buses is key to cleaner air and climate stability. EDF is helping break down barriers and pave the way to an all-electric future.

EVERY DAY, MORE THAN 15,000 trucks pound through the neighborhood of Hunts Point in the Bronx, many bound for New York's produce markets, spewing pollution as they go. It's no coincidence that this area of New York City has some of the worst air quality and highest levels of childhood asthma in the city.

"Smell that beautiful Bronx air!" cries Ivan Diaz, as he steers a truck into the fray. Beside him, colleague Auri Williams rolls her eyes. Bronx-born and bred, Williams, 25, suffered with chronic asthma growing up. "I missed so much school," she recalls. "When you can't breathe, it's the worst."

Today, Diaz and Williams are proud that, in a small way, they're part of the solution: The Mitsubishi Fuso medium duty truck they're driving is electric.

"There's no combustion, so there are no tailpipe emissions," says Diaz, a supervisor at the nonprofit HOPE Program, which creates employment opportunities in green construction and other areas for underserved populations.

Amid the diesel-belching behemoths clogging the road, their truck remains a novelty. EDF intends to change that. Alongside our work to shape the next federal diesel engine standards, we are working with businesses, utilities and governments to power up a rapid expansion in electric vehicles. Through our Truck and Bus Initiative, we envision the electrification of one-third of all new trucks and buses in the United States, China and Europe in the next 10 years. By 2040, that figure, for U.S. vehicles, must rise to 100%.

The transition couldn't be more urgent. Of the 385,000 premature deaths

associated with global tailpipe pollution in 2015, diesel vehicles accounted for nearly half — by far the largest contributor. Globally, emissions from trucks and buses are expected to double in the next 30 years. Yet to stay below the critical two degree global warming threshold established by the Intergovernmental Panel on Climate Change, the vast majority of global fleets must be zero-emission by 2050.

“It's a complex challenge but with the right partners we can do it.”

— Jason Mathers
EDF director of on-road vehicles

"The time for ambitious, widespread action is now," says Jason Mathers, EDF's director of on-road vehicles.

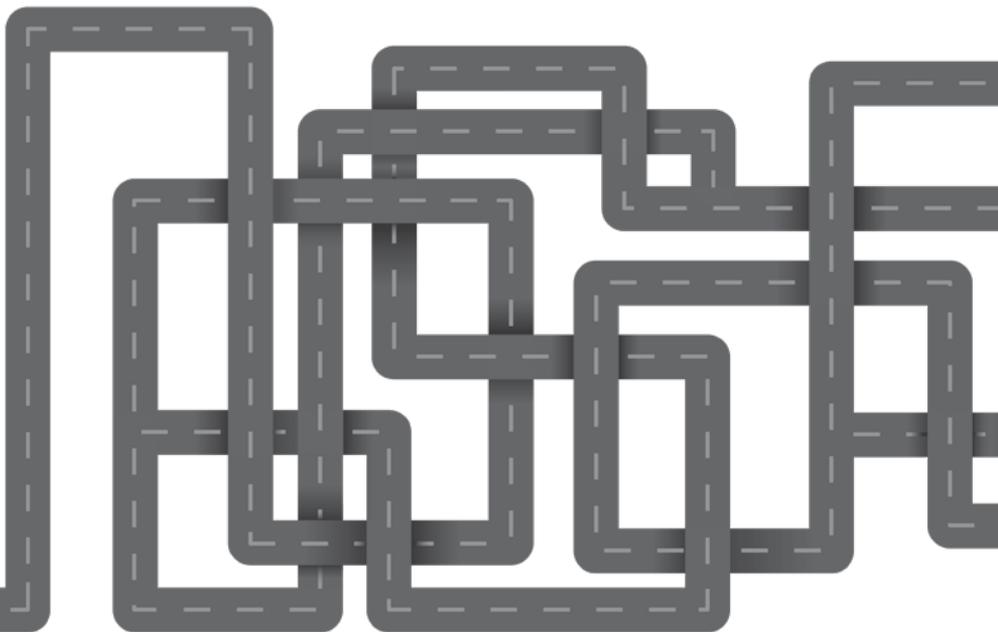
EDF is well-positioned to help speed the transition. As far back as 2001, we collaborated with FedEx to bring America's first hybrid delivery trucks

to the road. In the years since, our expertise in energy and public policy, our productive industry relationships, and our work connecting the dots between trucks, local air quality and health, have all led us to this decisive moment.

Rough road ahead

Mathers doesn't underestimate the challenges. Electric trucks currently comprise less than 0.5% of the global vehicle fleet. To transform the industry, EDF needs to overcome the skepticism of fleet owners accustomed to diesel engines. We must drive down the cost of purchase — currently up to triple that of diesels — galvanize business demand and bolster manufacturer confidence. We must promote green electricity, work with utilities to manage increased power needs and engage policymakers at the city, state and federal levels. And all this must be done while ensuring that communities that suffer most from traffic pollution — such as Diaz and Williams' area of the Bronx — also reap the benefits.

"It's a complex challenge but with the right partners, we can do it," says Mathers.





GRECKESHER.COM

Early adopters: In the Bronx, Auri Williams and Ivan Diaz charge their electric truck.

To jump-start the initiative, EDF will launch pilot projects in Houston, Los Angeles and New York. In each city, we will partner with commercial and municipal fleet operators, utilities, regulators and others to establish prototype electric fleets. These fleets, and the network of private entities and public policies that support them, will serve as blueprints for a second phase of projects in more cities. Similar work will follow in London and China. Together, China, the United States and Europe comprise 65% of the global truck and bus market.

Blazing a trail

In all locations, early adopters will be key allies. At New York's John F. Kennedy International Airport, bus driver Edward Gatrell flicks a switch, releases a brake and glides silently out of the depot

toward his first stop. Gatrell is driving one of 18, soon to be 36, electric buses that ferry passengers around JFK, LaGuardia and Newark airports. The initiative is part of the Port Authority of New York and New Jersey's commitment to the Paris climate agreement, under which the organization aims to reduce its emissions 35% by 2025 and 80% by 2050.

29%
of U.S. carbon emissions
come from transportation

"Transportation is now America's biggest source of greenhouse gases, and we recognize our responsibility to address that," says the authority's director of environmental and energy programs, Christine Weydig.

Key to the agency's success has been its ability to engage multiple factions. The Port Authority's project lead, Charles Goldberg, brought fleet operators and maintenance subcontractors on board and initiated a monthly knowledge-sharing assembly that now includes 34 representatives from transit authorities in nine different states.

"This is all very new — we're working things out together," he says.

Already the work has ripples. One of the Port Authority's largest tenants, JetBlue, announced it will convert much of its ground service equipment at JFK to electric.

Lower maintenance costs

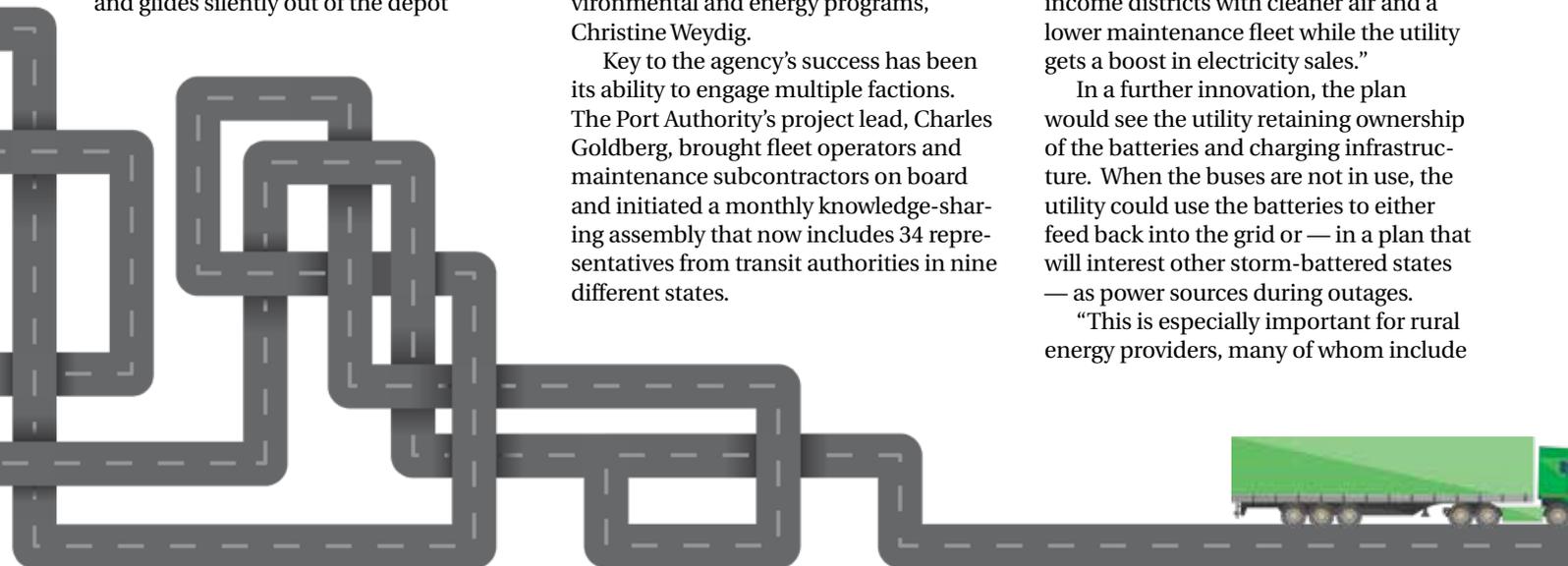
A major barrier for early adopters is cost. Battery prices dropped 87% between 2010 and 2019 and they continue to fall. But at point of purchase, electric trucks and buses are unlikely to reach price parity with internal combustion engines for many years to come. Yet EDF modeling has shown that lower fuel costs and reduced maintenance mean that over the course of their lifetime, electric buses and some trucks are, in many circumstances, already cheaper than diesel. At an electric vehicle expo in New York City's Union Square last fall, a salesman demonstrated why. Popping the hood of a truck, he pointed out the low number of moving parts. He showed how braking recharges the battery, reducing wear on the brakes. With typical New York swagger, he proclaimed he didn't know how long it would take the brakes to wear out: It has never happened.

In North Carolina, EDF is now using this fact to develop a plan to finance electric transit and school buses. Under this plan, utilities would fund the additional upfront cost of the vehicles and the school district or municipality would pay back the difference through its utility bills. Repayments would be set to never exceed the savings made.

"It's a win-win scenario," says Dionne Delli-Gatti, EDF's director of regulatory affairs. "The arrangement provides low-income districts with cleaner air and a lower maintenance fleet while the utility gets a boost in electricity sales."

In a further innovation, the plan would see the utility retaining ownership of the batteries and charging infrastructure. When the buses are not in use, the utility could use the batteries to either feed back into the grid or — in a plan that will interest other storm-battered states — as power sources during outages.

"This is especially important for rural energy providers, many of whom include





SHUTTERSTOCK

A transition has begun

There are clear signs that the transition to electric trucks is already underway. In 2019, 43 states took actions relating to vehicle electrification. California, Colorado, New York and North Carolina all have electrification plans tied to their climate goals. In Michigan, Nevada and Virginia, students will soon join peers in New York and California by going to school on electric buses.

In California, the Air Resources Board, with EDF's input, is considering a groundbreaking new rule requiring manufacturers to sell a certain percentage of electric trucks. And just last year, the state became the first to mandate all public buses be electric by 2029.

Companies and manufacturers are also stepping up. Pepsi and Ikea have both made significant commitments on fleet electrification. Amazon recently committed to purchasing 100,000 electric delivery trucks. And this summer, two Freightliner electric 18-wheeler rigs began operating in Southern California — significant because the diesel version is the top-selling truck of its size. “This is the start of a major change in the way companies will operate,” said Sid Brown, CEO of NFI, which runs the trucks.

Globally, manufacturers have announced investments of more than \$90 billion in electric vehicles. Ford Motor Company recently previewed an electric version of its F-150 pickup, part of the best-selling line of pickups in the U.S. for 42 years. And with input from EDF, America's biggest diesel engine manufacturer, Cummins Inc., released bold new greenhouse gas reduction goals that could help strengthen its zero-emission offerings.

As EDF's Mathers says: “There is a lot of momentum now. This is a dynamic time.”

>>> TAKE ACTION >>> Tell companies to make the leap to electric fleets by signing our petition at edf.org/cleandelivery

Electric is better: Air inside diesel buses can be up to five times dirtier than outside.

community resilience and social justice as part of their mission,” Delli-Gatti explains. “This sort of financing ensures low income communities don’t get left behind in the electrification revolution.”

Powering up

Having more electric vehicles requires a greater supply of electricity. Even if companies and transit agencies want to commit to electrification, they are limited by what their utility can provide. As Steve Cliff of the California Air Resources Board says, “Having the opportunity to fuel, how fast and where it can occur — those are all limitations now.”

With just 36 buses, power demand at the Port Authority of New York and New Jersey is relatively low. Larger fleets, or those that require high-speed charging, will need their utilities to provide the extra power. That can require major infrastructure works, which can take years.

There are solutions at hand.

In California, EDF worked with the Public Utilities Commission to develop cheaper off-peak charging rates that reduce stress on the grid and the need for additional infrastructure. We also advised on rules for operating big charging systems. The work is already having an impact. Among the state's largest utilities, Southern California Edison is running a pilot to install hundreds of millions of

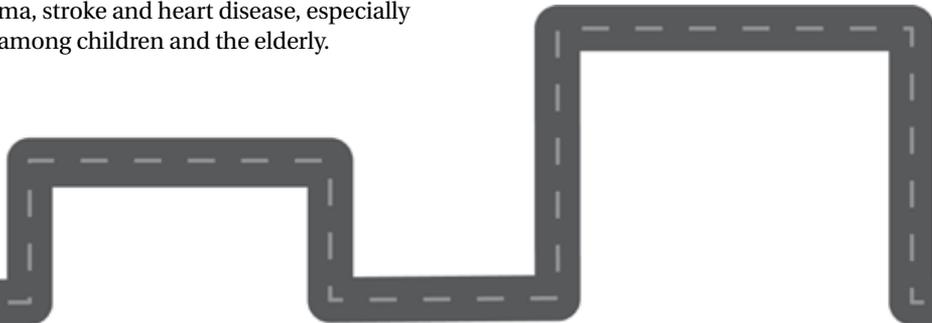
dollars’ worth of charging infrastructure. And PG&E recently launched the nation's first rate specifically for charging commercial electric vehicles.

Keeping it clean

But what of the emissions from generating that power? The good news is that U.S. electricity generation is getting cleaner every year. And looking at how electricity is generated today, electric buses are already cleaner than diesel in every state.

More must be done to grow renewable energy but vehicle electrification cannot wait. Companies typically upgrade vehicles every 10 to 12 years, so each new diesel vehicle locks in emissions for a decade at least. “We don’t have the luxury of waiting for a completely clean grid,” says EDF's Mathers.

For anyone living near busy roads, electric engines are far healthier. A recent EDF study of air pollution in Oakland, California, found that residents living near roads with heavy truck traffic had eight times higher exposure to air pollution than those living just a few blocks away and suffered higher rates of asthma, stroke and heart disease, especially among children and the elderly.



The rise of clean cars

Cars helped build the American dream — and its legacy of badly polluted air. Now the Trump administration threatens to slow progress on cleaner vehicles. The momentum for cleaner cars, however, is unstoppable.



AT THE HEIGHT OF THE SECOND World War, in July 1943, a choking mist descended on Los Angeles. Residents reported that their eyes and throats stung, and families piled into their cars and headed for the mountains. A rumor spread that the Japanese had launched a chemical attack.

In fact, it was Los Angeles' first major brush with smog, a problem that would only grow worse in the coming decades. But if you compare a photo of Los Angeles in 1970 to one taken yesterday, you'll see a big difference. The modern picture shows much cleaner air.

This success is due to the 1970 Clean Air Act, which started the country along a path toward healthier air. Automakers were required to build cleaner cars, and they did, although not without a fight. On many occasions, EDF went to court to compel them to comply with clean air standards, and we've succeeded. Today's vehicles produce 99% less conventional pollution than those of 60 years ago.

But the reduction in climate pollution was far less. The emergence of climate change as a critical issue, and the ongoing threat of air pollution to public health, demand that cars become even cleaner. So, in 2012, former President Obama finalized stringent new clean car standards. The standards, which would nearly double our current fuel economy by 2025, were adopted with broad

support from automakers, labor and consumers. In poll after poll, Americans still support the initiative. Over the life of the program, cleaner cars will save consumers \$1.7 trillion, save lives and lower climate pollution.

The technology automakers need to make cars cleaner is ready, such as cylinder deactivation. Car companies are investing heavily in electric vehicles, and General Motors is spending \$2 billion on a battery factory in Ohio.

The Trump administration has put all this progress at risk. Deploying misleading and false analysis, the administration is poised to unveil its proposal to roll back the clean car standards. EDF is prepared to file suit the moment the announcement is made.

The administration has now taken the fight to the next level, moving to quash California's long-established authority to set its own, stricter clean car standards. Under the Clean Air Act, California has the right to set its own standards and has often done so. Other states have the option of following California's lead, and 24 states have, most recently Colorado. EDF was heavily involved in the effort to get Colorado to join the movement.

"Clean cars are the future, and everyone knows it, including the auto companies," says EDF Attorney Alice Henderson. "The administration can slow the transi-

tion down, but it can't stop it."

Remarkably, Ford, Honda, BMW and Volkswagen have all announced that they will adhere to California's stronger standards. (GM, Chrysler and Toyota have sided with the administration.)

EDF is part of a broad coalition defending California. When the Trump administration launched its attack on the Golden State's standards, EDF and 23 states — including Michigan, home of the U.S. auto industry — filed suit in federal court to block the attack.

5.1 million
The global electric car fleet in 2018 is almost double the previous year

"Once again, the EPA has handed decision-making to fossil fuel lobbyists and climate change deniers," says Maura Healey, Massachusetts' attorney general.

Clean cars save consumers money, cut climate pollution and protect human health. Even many auto companies oppose the rollback. So who supports it, besides Chrysler, GM and Toyota? Just the Trump administration and some oil companies, which stand to sell more gasoline. They are on the losing side of history.

Charlie Miller



The next frontier: planes and ships

In the global effort to reduce carbon emissions, the aviation and cargo ship industries have been outliers. Together, they account for about 5% of global climate pollution, and that's expected to rise significantly as air travel and trade grow. That's why EDF is working with these lagging sectors to slash their emissions.



DEPOSIT PHOTOS

Sustainable ships

If shipping were a country, it would be the sixth biggest emitter of greenhouse gases. Moreover, in the absence of strong policy, the emissions from international ship traffic are predicted to more than double by 2050.

The International Maritime Organization agreed in 2018 to cut global shipping emissions in half by 2050. This is important because international shipping is not covered under the Paris climate agreement.

“The challenge is to craft policies at the IMO that can commercialize zero-emissions vessels and get them out onto the water quickly,” says Aoife O’Leary, EDF’s director of international shipping and carbon pricing. “Because shipping visits all parts of the planet, the introduction of a carbon price would generate revenues for research, development and deployment of solutions, and have a positive impact across the globe.”

90%
of global trade moves
by ship

Last year, a coalition of shipping companies and countries pledged to operate zero-emissions ships along deep-sea routes by 2030. This pledge was heavily influenced by EDF’s *Sailing on Solar* report, which explores the vast potential of clean alternative fuels such as green ammonia. Since 90% of global trade moves by ship, slashing emissions on the high seas will help put the world’s freight on a low-carbon path.

Rod Griffin



Friendlier skies

Though air travel is the largest part of many people’s carbon footprint, it makes up just 2–3% of overall global emissions. But as the skies grow more crowded — an additional 24,000 jets are expected to take wing by 2040 — that number will soar unless we take smart action now.

To reduce the impact of flying, EDF has worked intensively with the International Civil Aviation Organization on a system to cap carbon emissions from international flights beginning in 2021. We’re now pressing for cuts.

It’s the first global carbon market system for an entire industry, with 80 nations participating. EDF played a key role in negotiations, promoting the use of economic incentives to help airlines meet that cap cost-effectively. The anticipated price on carbon is already spurring action.

The aviation program gives airlines flexibility to meet their caps by reducing their emissions using low-carbon fuels, or offsetting them by investing in clean energy, tropical forest conservation and

other programs that achieve verified reductions. Our goal: to ensure the new market operates with integrity and, once it’s established, ratchet the cap down.

“These rules must establish strong transparency and prohibit double counting of emissions reductions,” says EDF International Counsel Annie Petsonk. “Otherwise, airlines could get credit for reductions that others — including host countries — are already using to meet their own emissions targets.”

United Airlines has teamed up with EDF to achieve the carrier’s goal of cutting emissions 50% by 2050. United will invest \$2 billion a year in more fuel efficient aircraft and expand its use of low carbon fuels. “As soon as one airline shows how to lead, it puts pressure on others to follow,” says Petsonk.

If successful, the aviation program will avoid at least 2.5 billion tons of carbon pollution by 2035, roughly equal to the total annual emissions from the U.S. power and manufacturing sectors.



In troubled times, a lifeline for the Amazon

RAGING FIRES IN THE BRAZILIAN Amazon last year, largely the result of widespread illegal activity to clear land for agriculture, brought into focus the role of tropical deforestation in climate change.

California is doing something about it. In September, the California Air Resources Board endorsed a new tropical forest standard, a set of stringent criteria for reducing deforestation effectively. If California opens its carbon market to forest credits, tropical states would need to meet the standard to participate. The criteria, developed with help from EDF, require that deforestation be reduced over an entire state or province and that indigenous peoples be fully involved in the program's design and implementation.

"These incentives make forests more valuable alive than dead," says Dr. Steve Schwartzman, EDF senior director for tropical forest policy. "It's a powerful signal to rainforest nations that the world values the climate and ecosystem services they provide."

Schwartzman, an anthropologist, has spent three decades working with Amazon indigenous communities to help

them monitor their territories and coordinate enforcement against illegal land-grabbing. Ending forest loss and pursuing restoration and reforestation efforts can reduce overall global greenhouse gas emissions by at least 25%.

"Protecting the world's forests represents perhaps the greatest and most cost-effective opportunity to turn the corner on climate change over the next two decades," says Schwartzman.

EDF is also working to transform supply chains and trade networks — such as for soy and beef — to reward regions that commit to zero-deforestation goals, building pressure on suppliers for socially responsible action.

Much of our work is focused on the state of Mato Grosso, an agricultural region that accounts for about a quarter of Brazil's soy production and is home to the country's largest cattle operations. More than half of the state is intact Amazon forest and savanna, but it's under increasing threat from deforestation.

We're working with major retail and food service companies — and their suppliers — on a system that would reward Mato Grosso for a verifiable commitment to zero deforestation.

A major impediment to the global carbon market has

been the historically uneven quality of forest credits. So, EDF launched an independent nonprofit, with funding from the government of Norway and others, to facilitate investment in tropical forest protection.

The Emergent Forest Finance Accelerator will commit to buying forest credits that meet the highest environmental standards while safeguarding the rights of indigenous peoples — and then sell those credits to interested buyers, eliminating uncertainties that have worried buyers in the past. "We believe the market could potentially cover billions of tons of carbon emissions and amount to tens of billions of dollars per year," says Ruben Lubowski, EDF's chief natural resource economist.

Rod Griffin



EDF partner Megaron, chief of the Kayapo tribe.



THE WILSON LEGACY

This feature honors the memory of Robert W. Wilson, a longtime EDF supporter and champion of harnessing market forces to drive environmental progress. See edf.org/wilson



Hurricane Florence hammers eastern North Carolina, September 2018

Getting ready for the next flood

By Shanti Menon

When disaster strikes, communities rally. EDF is bringing leaders from North Carolina and Iowa together to learn from each other how to thrive in a warmer, wetter world.

CLIMATE CHANGE IS MAKING storms more frequent and more damaging. Few places have made that fact more painfully obvious in recent years than North Carolina, where Hurricanes Matthew and Florence

walloped the state with two “500-year” floods in 2016 and 2018. Florence took 43 lives and caused \$17 billion in damage. One month later, tropical storm Michael hit. Then in September 2019, Hurricane Dorian pummeled the coast.

“It’s not enough to pick up the pieces,” Gov. Roy Cooper told Congress. “We must take action to prevent this kind of devastation in the future.”

In a state where the previous governor once said climate change was “in God’s hands,” the dialogue on climate change is changing. “People are demanding solutions, but they don’t quite know what those solutions are,” says Will McDow, EDF’s director of resilient landscapes.

That’s why EDF took a group of farmers, mayors, scientists and state officials from North Carolina to see a state that has been building flood resilience for 10 years — Iowa. In 2008, widespread flooding caused \$10 billion of damage in Iowa,

submerging nearly 3 million acres of farmland and inundating towns. Ten square miles of Cedar Rapids, Iowa, lay underwater, displacing 18,000 people. In response, Iowa invested in a comprehensive effort to reduce future flood damage.

Farmers help with floods

The team from North Carolina converged on the farm of Nick Meier, whose corn and soybean fields lie upstream from Cedar Rapids. He’s one of many farmer partners working with the city and others to establish flood-reducing practices on their land. Meier has built saturated buffers — narrow strips along the edges of cropland that soak up water and nutrients before they flow downstream. And he’s creating a wetland on his farm to hold even more water. “I’m very concerned about what happens downstream,” says Meier. “With this partnership I can be proactive about it.”

More than 10,000 acres of private land in the Middle Cedar River watershed are now using practices like buffers, ponds and keeping the soil covered with crops year-round to reduce flood risk and protect soil and water quality. Research from



ANETA GOSIA

Iowa farmer Nick Meier is creating a wetland.

“Bridging the divide between urban and rural communities will be critical.”

— North Carolina's new Chief Resilience Officer Jessica Whitehead

the Iowa Flood Center at the University of Iowa shows that these strategies, if used on a large scale, could have reduced Cedar Rapids flooding in 2008 by 7 inches — the difference between water at the doorstep and water inside homes. IFC experts are testing this approach in eight watersheds across the state and are planning a reciprocal visit to North Carolina.

In the 10 years since its inception in the wake of the floods, IFC has built a network of 300 stream sensors, rain gauges and hydrologic stations, created floodplain maps for all 99 Iowa counties and developed sophisticated computer flood modeling systems, all of which allow it to make real-time, publicly accessible flood forecasts for more than 1,000 communities. In 2016, IFC predictions helped Cedar Rapids prepare for its second biggest flood in history, greatly reducing flood damage.

North Carolina's resilient future

EDF is advocating a similar collaborative, science-based approach in North Carolina, in which farmers, cities and state authorities work together to reduce flood risk. “After the trip, people have a shared vision of what a resilient North Carolina can look like,” says McDow. “Partnerships like this can help build resilience in rural communities across the country.”

Step one is to understand how and where water moves. The source of flooding in one town or one farmer's fields

may originate far upstream.

EDF is working with Barbara Doll, a North Carolina State University scientist who attended the Iowa trip, on flood modeling in the Neuse River Basin in eastern North Carolina. “We'll be applying things we learned on the Iowa trip,” says Doll. One of the lessons: It's important to make models easy for the public to understand. The North Carolina legislature recently approved an extra \$5 million to expand flood reduction strategies, including flood modeling.

Regional collaboration is another key to improving resilience, says Jessica Whitehead, North Carolina's new chief resilience officer, who also attended the trip. “Seeing the way that Cedar Rapids is working up the watershed to collaborate with rural communities was very exciting,” says Whitehead. “In order to take a strategic approach to resilience in North Carolina, and find the broadest ways to reduce risk for the greatest number of people, bridging the divide between urban and rural areas will be critical.”

Mayor Don Hardy of Kinston, North Carolina, a city hit hard by hurricanes Matthew and Florence, was similarly impressed by what he saw in Iowa. “Those flood maps — we need that. Bridge sensors, stream gauges, we need more,” he says. “But there's only so much we can do alone. Now is the time to build partnerships to put flood mitigation in place. This trip has opened my eyes to options.”



Leaders from North Carolina and Iowa talk flood prevention.

How will retirement affect your philanthropy?

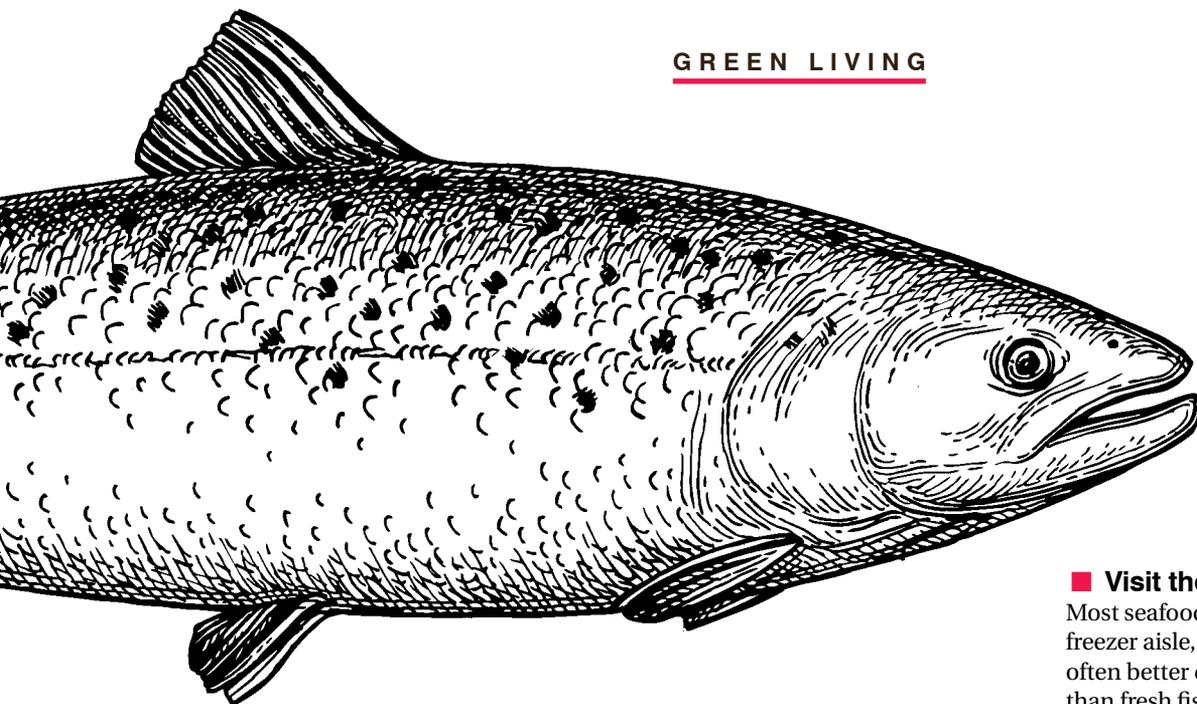
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ANETA GOSKA



Get smart about seafood

EATING SEAFOOD IS A CENTRAL part of the culinary experience for many Americans. But you may be surprised to learn that more than 80% of the seafood Americans eat is imported.

Broadening your seafood palate beyond traditional picks like shrimp, salmon and tuna, which make up 44% of the total, is not just about trying something new. It's also a good strategy for eating healthier, saving money and helping protect the oceans by reducing overfishing and building resilience against warming oceans.

There's a perception that sustainability is expensive, but that's not always the case. Here are some tips on becoming a smart seafood consumer.

■ More surf, less turf

Americans on average eat half the amount of seafood recommended by health experts. It is also one of the lowest carbon footprint animal proteins. So, if your diet consists of a lot of meat and you substitute seafood for some of that, you're actually able to substantially reduce your carbon footprint.

■ Know your supplier

Seafood is one of the trickiest foods we buy. Thus, when you find a fishmonger — or grocery store — whom you trust, stay with them. One of the big victories of the sustainable seafood movement over the past 20 years is that 80–90% of the U.S. grocery industry now has some sort of sustainable seafood policy.

■ Buy American

It sounds clichéd, but U.S. seafood is generally a good option compared to fish from other countries, which is often less sustainable. Today, 46 U.S. fish stocks that were once overfished have been completely rebuilt. Examples include Gulf red snapper and many Pacific rockfish. Locally sourced seafood also typically requires less fuel for transport.

■ Check the label

Most grocery stores are required to label the country of origin for fish and whether it is farmed or wild. Unfortunately, restaurants, where Americans spend most of their seafood dollars, are not subject to that law. When in doubt, ask about the restaurant's sustainability policy. More than 20% of seafood sold in the United States is mislabeled, according to Oceana. Frequently mislabeled species include sea bass, snapper and halibut.

■ Visit the freezer section

Most seafood lovers steer clear of the freezer aisle, yet these days frozen fish is often better quality and more affordable than fresh fish. The advent of “flash-freezing” allows seafood to be frozen at peak freshness, capturing flavor, preserving texture and maintaining high nutrition value.

■ Try something new

Seek out species that are not overfished, yet are tasty and affordable. For example, New England fishermen landed only half of what they were allowed to catch of Acadian redfish due to a lack of demand from the market. This versatile fish is lean, flaky and moist — perfect in fish tacos.

■ Eat lower on the food chain

Americans have a lot to learn from Europeans and South Americans. Small oily fish like sardines, mackerel and herring are quick to reproduce, high in healthy omega-3 fatty acids and low in mercury. “These species are ocean friendly, wallet friendly and heart healthy,” quips EDF's Tim Fitzgerald. “Plus eating them will probably make you a more interesting person.” Clams, mussels and oysters are also great choices.

Rod Griffin

MENUS OF CHANGE

Smart Catch

The James Beard Foundation provides a list of seafood restaurants that meet high standards for sustainability. bit.ly/85jSf

Eat These Fish

EDF partnered with Chefs Collaborative and others on a campaign to promote underappreciated fish that are sustainably caught and tasty. bit.ly/2UtVt

Seafood Watch

The Monterey Bay Aquarium offers a comprehensive guide — and mobile app — that's regularly updated to help you make smart seafood choices. bit.ly/2vDeB

Members pitch in to save a beloved butterfly

Solutions asked EDF members to tell us how they are helping monarchs on their migration. Here are a few of the hundreds of impassioned responses we received.

I live in a small community on Lake Michigan where milkweed grows. Property owners would pull the milkweed to beautify their lawns, and the roadsides were mowed. At our association, I gave a short talk on monarchs. I got a lot of feedback, such as, "I had no idea they're declining." After that brief talk, things changed. Residents are now preserving milkweed on their property and the board has stopped mowing the roadsides. I'm amazed it did not take much effort to make a change. Our milkweed population has increased.

— **Janis Morrison, Macomb, MI**

Monarchs frequently visit my milkweed plants. I noticed some eggs one day, but was heading out of town, so I threw a mesh delicates bag from my laundry over the milkweed and tied it tight to keep predators

away. I came back to find caterpillars on the plants and released them. Now I'm looking to buy a larger delicates bag!

— **Rosemary Calhoon Takacs, Ponte Vedra Beach, FL**

Have released 104 monarchs. I keep a record and give each one a name as they are released.

— **Betty Twyman, Fort Lauderdale, FL**

My daughter, age 12, decided that she would personally help out monarchs as best she could. She bought two milkweed plants with her money. She tended them all summer, buying ladybugs to eat the aphids. A few weeks ago, we discovered three caterpillars. One made a chrysalis, but for weeks, nothing happened. Until today. My daughter held a vigil until 12:43

this afternoon when the monarch finally emerged and stretched her wings! A few hours later, she fed the new butterfly a bit of sugar water and released her to the wild. We wish her the best on her journey to Mexico.

— **Bernard Ortiz, Savannah, NY**

As a second grade teacher I collected monarch caterpillars so my students could watch the metamorphosis. Now I'm retired and I recently planted milkweed in my garden. It became a magnet for monarchs to lay their eggs. I've been able to supply our town's kindergarten classes with caterpillars to raise. My niece has asked for a milkweed plant for her birthday!

— **Pat Lenzi, Barrington, NH**

Letters have been edited for space.

Kids for caterpillars

It's not every day that a picket line forms by the Whittier Elementary School in Boulder,



Colorado. But there they were, 7-year-olds carrying signs that urged adults to protect the monarch butterfly. Passing cars honked in support of the butterfly brigade.

Increasingly, in schools across the country, students of all ages are mobilizing to help the beloved monarch, whose numbers have plummeted due to habitat loss and other factors.

"Our students were shocked to hear that monarch populations are down 90%," says Tamar van

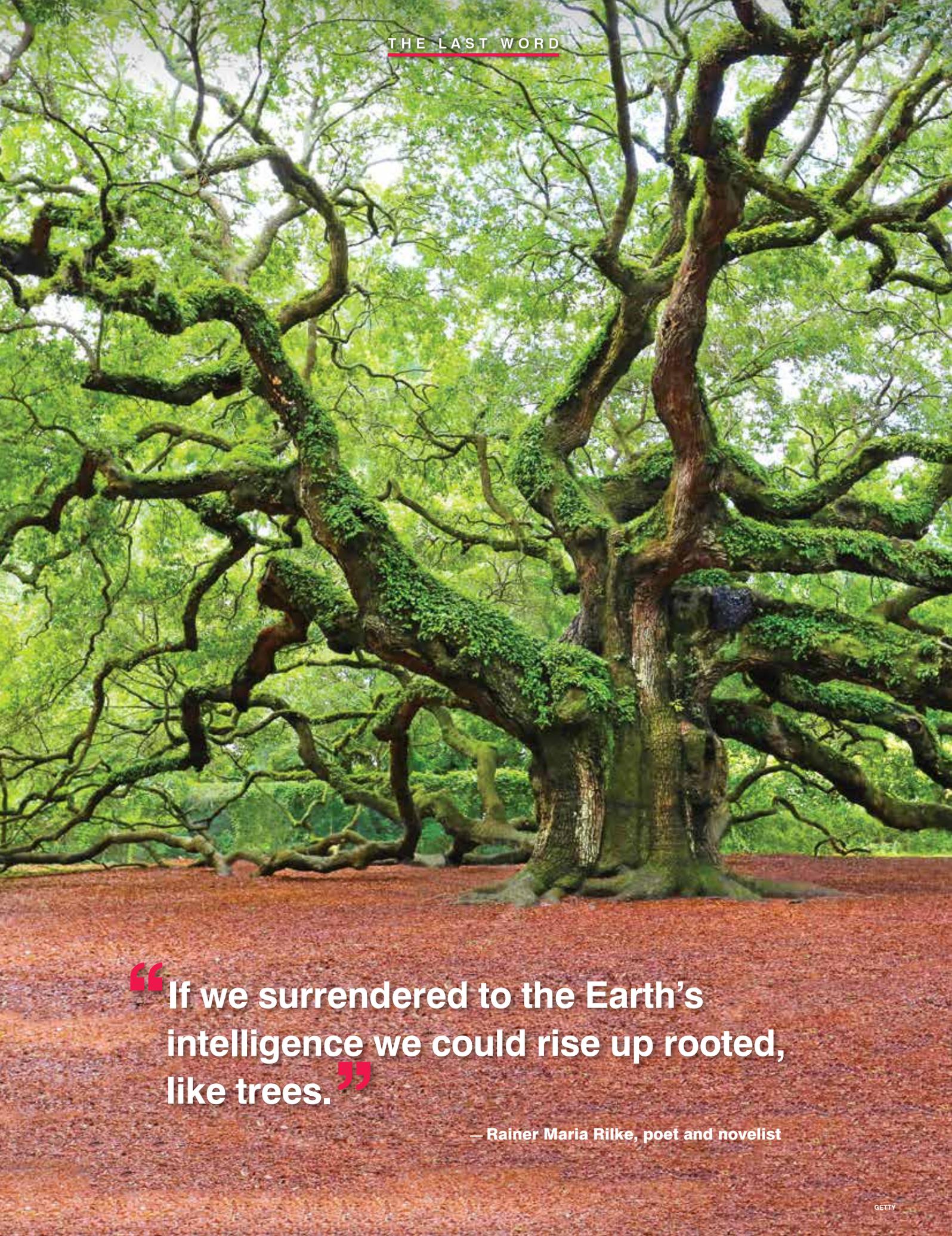
Vliet, a teacher at Whittier. "They wanted to do something."

So, guided by an EDF pamphlet, the students grew and planted milkweed seeds on the school grounds. Milkweed is the only plant monarch caterpillars eat. Then they made presentations to larger groups, created signs and wrote letters to EDF.

"It doesn't take much to get kids excited about insects," observes van Vliet.

Many Whittier students come from at-risk families. Some had crossed the southern border with their parents.

"The children were fascinated that a single butterfly can migrate 2,500 miles," says van Vliet. "They connected to the challenges faced by the monarchs. They see things that we don't see."



“If we surrendered to the Earth’s intelligence we could rise up rooted, like trees.”

— Rainer Maria Rilke, poet and novelist