

Solutions



Environmental
Defense
Fund

Vol. 54, No. 1 / Winter 2023

**“This is
our home.”**

Meet the Indigenous leaders
fighting to preserve Ecuador's
rainforest and stabilize the climate.

ALSO INSIDE: Texas's vanishing swimming holes | Climate Corps at 15 | Save \$\$, save the climate

A photograph of a lush green park, likely the High Line in New York City, with a city skyline in the background. The sky is filled with dramatic, dark clouds, and the sun is setting or rising, casting a warm glow over the scene. People are seen walking and sitting on the grassy area. A modern, white, cantilevered structure is visible on the right side of the image.

A big green vote

In November, 10 years after Hurricane Sandy, New York voters overwhelmingly approved a \$4.2 billion environmental bond that includes major investments to reduce flood risk. EDF led a statewide, multilingual campaign to educate voters about the bond, which will dedicate funding to flood resilience, climate pollution reduction and public health efforts, as well as open-space conservation and drinking water safeguards. Having state funds at the ready will also help attract additional federal money from the Inflation Reduction Act — making New York’s bond act a model for other states to follow.

People power the climate fight



February can be cold and somewhat dreary here in New York. And yet, I'm filled with hope.

Why? Because thanks to the Inflation Reduction Act, we now have a path to almost halving U.S. emissions from 2005 levels. Years of perseverance by EDF and the environmental community helped lead last year's passage of this historic climate law (*see p. 13*). And though we enter 2023 with a split U.S. Congress, I'm confident in the law's durability. Support

for clean energy increasingly transcends party lines among voters.

It was great to walk into the U.N.'s annual conference on climate change — COP27 — last November, knowing the U.S. had made this \$369 billion commitment to fighting climate change. While there, I had a chance to personally thank former Speaker Pelosi and the rest of the U.S. delegation for making such a transformative investment in our planet's future.

I also got to see three inspirational new EDF leaders in action.


Angela Churie Kallhauge previously led the World Bank's coalition on carbon pricing. Watching her lead our delegation at COP — where she once negotiated on behalf of Sweden and the European Union — was inspirational. I know Angela will take EDF's work to new heights as she leads the team that is, among other things, working to elevate the voices and power of Indigenous communities fighting to preserve tropical forests in some of the most pristine and beautiful places in the world (*see cover story, p. 8*).

Mandy Rambharos joins EDF after 20 years at Eskom Holdings, Africa's largest electric company, where she led the development of a just energy transition partnership for South Africa. Mandy's leadership in international climate negotiations, including at COP, ideally positions her to represent EDF in promoting more ambitious climate policies at the U.N., and the G20 and G7 summits. Mandy told me she decided to join EDF because of our credibility in both the policy world and the private sector and the people-centered focus in all we do.

Pedro Martins Barata is one of the world's leading experts on carbon markets. Prior to joining EDF, he led his home country of Portugal's negotiations on the development of the European Union's Emission Trading System, which was, until recently, the largest carbon market in the world. We are thrilled to have him lead EDF's work helping the private sector and governments use carbon markets to address the climate challenge.

Through EDF's summer fellowship program, Climate Corps, we are also cultivating the environmental leaders of tomorrow. Last summer, more than 200 fellows worked with companies and organizations in China, India and the U.S. Today, more than 1,500 alumni work toward saving the planet in more than 40 countries (*see story, p. 14*).

As always, thank you for supporting EDF. Our work would not be possible without you.


EDF President

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Solutions

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EDF'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.
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FIELD NOTES

EPA fast-tracks funding for clean school buses

Almost 400 school districts around the U.S. will receive approximately 2,500 new, lower-pollution school buses, thanks to a decision this fall by the Environmental Protection Agency to double its 2022 spending for electric and other lower-pollution school buses. Nearly 95% of the new buses will be zero-tailpipe-pollution electric buses. The fast-tracked funding of \$965 million comes from the \$5 billion Clean School Bus Program included in the federal Bipartisan Infrastructure Act, legislation EDF and affiliates helped pass in 2021.

“When you are talking about clean air, sooner is better,” says Melody Reis, legislative manager for Moms Clean Air Force, an EDF affiliate which has lobbied for state and federal funding for clean school buses for years.

Of the nation’s 480,000 school buses, almost 95% run on diesel. They make an outsized contribution to climate change and local air quality problems and are a danger to the health of kids and drivers. Diesel pollution, often found at higher levels inside school buses than immediately outside them, is linked to cancer and lung and heart disease; research published in 2019 found that kids exposed to diesel pollution do less well in school.

Moms continues to advocate for more clean school bus funding at the state and federal level. The group’s goal, along with EDF’s, is to make sure that by 2035, every new school bus, transit bus and urban delivery truck sold in the U.S. is a zero-emissions vehicle.

“Fast-tracking clean buses will help utilities and bus companies see that they’re a good investment,” says Reis. “They’re better for kids, drivers and our communities. They’re a win for absolutely everyone.”



DREAMSTIME.COM

Birdwatchers flock to new app

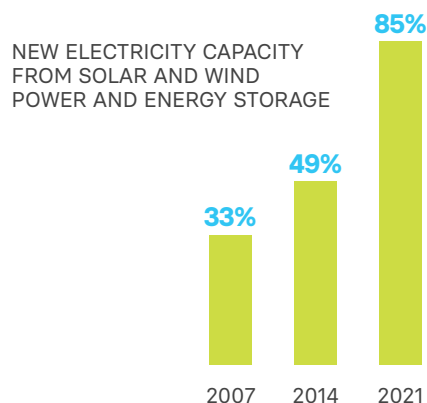
For tens of millions of Americans, birdwatching creates a close connection to our breathtaking and vulnerable planet. Now, a new English and Spanish web-based tool — the Bird Migration Explorer — can strengthen that connection by allowing users to track the migratory times and locations of 450-plus species across the Americas. The app’s interactive map explores conservation challenges in searchable

locations and provides a scientific basis for addressing pollution, habitat loss and other factors that threaten birds in the Western Hemisphere.

“It’s my hope that those who interact with the Explorer app are inspired to find meaningful ways to protect and sustain our natural world,” says Jack Dangermond, president of the geographic information system developer Esri, which participated in the project.

New clean electricity sources on the rise

Every year, some U.S. power plants are retired and new electricity sources are brought online. In 2021, 85% of that new capacity came from solar and wind power and energy storage, such as batteries. That’s up from 49% just seven years earlier.



Source: U.S. Department of Energy



SARAH SILBERG FOR WOMEN'S CLEAN AIR FORCE

Ryan Williams

Foundation Officer

What do you do?

My colleagues and I work on managing and growing EDF's relationships with foundation donors.

What drew you to EDF?

I want to be in the fight for the future.

What do you do when you're off the clock?

I'm a City Councilor in Melrose, Massachusetts, where I live. It's the smallest city in Massachusetts, but we have some pretty big climate goals!

Such as...?

We're experimenting with a pilot program to install electric vehicle (EV) chargers on utility poles. Because they're mounted directly on the poles, you don't have to dig up the sidewalk and run new wires to install them. We are the first city on the East Coast to try this approach. We're also looking for our first EV garbage truck, and just passed a \$3 million bond to make our elementary school roofs solar-ready.

Tell us something surprising.

In college, I was a U.S. Coast Guard-licensed Master Captain and operated large commercial ships in the Great Lakes.



9 million 

The Inflation Reduction Act,

the U.S.'s historic new climate law, won't just cut pollution and support clean energy. It is also projected to create 9 million new jobs.

Source: University of Massachusetts

1° F 

With the U.S. ratification

of the Kigali Amendment, the world is on the way to phasing out climate-damaging refrigerants called hydrofluorocarbons — averting as much as 1° F (0.5° C) of global warming.

Source: United Nations Environment Program

China's new carbon-neutral park

A 16-acre, carbon-neutral park is now open in the Fangshan district of Beijing, China, featuring solar power, electric vehicle chargers, energy-efficiency and water-efficiency measures and more than 12 acres of newly planted trees.

EDF and a team of partners, including the HD Environmental Consortium, the Chinese Society of Environmental Science and Beijing's Gongchen district government, planned and developed the Haotian Carbon-Neutral Park to provide local residents with green space and recreation.

The team hopes the park can serve as a model as China ramps up efforts to create and restore almost 250,000 acres of parks and urban green spaces by the end of 2025. 250,000 acres is about the size of Hong Kong.

“Our vision,” says EDF's Regional China head Hu Qin, “is to demonstrate to the public, government officials and others that carbon neutrality is economically and technically feasible now. Ultimately, this will help local governments drive national initiatives from the bottom up.”

COURTESY EDF CHINA



A solar gazebo in Beijing's Haotian Carbon-Neutral Park.

Our logo has evolved!

Notice anything different on the cover of this magazine? EDF's new logo is designed with a new shape and bold new colors for maximum readability in the digital era.

“We are excited about this evolution,” says EDF's chief marketing and communications officer Amy Middleton. “The four sections represent water, Earth, trees and sky. Or, in essence: A vital Earth. For everyone. The circular shape of the vital Earth modernizes our identity while honoring our heritage.”





GUY MIDKIFF / ALAMY STOCK PHOTO

A tale of two springs

The plight of Texas’s legendary swimming holes reflects water woes across the West, where drought and overpumping are depleting an essential resource.

By Tom Clynes

FOR MORE THAN 11,000 YEARS, water has sprung from the earth of the Chihuahuan Desert near what is now the West Texas town of Balmorhea. Native Jumano and Mescalero people used the water to irrigate corn and other crops. During the Great Depression, the Civilian Conservation Corps built the world’s largest spring-fed swimming pool directly over the San Solomon Springs. Today, the pool attracts hundreds of thousands of visitors a year, who also visit nearby hotels, restaurants and other businesses, pouring more than \$4 million into the local economy.

“Without these springs,” says Neta Rhyne, who owns the Toyahvale Desert Oasis swim and souvenir shop, “this would just be a dust bowl.”

Lately, though, San Solomon’s prodigious flows have been declining, along with other springs across the drought-stricken state.

“We’re worried because there are

currently no regulations that protect the springs,” says Vanessa Puig-Williams, who directs EDF’s Texas water program. EDF and partners are working to preserve San Solomon and other Texas springs, as part of a broader effort to drought-proof water supplies in the western U.S.

Groundwater flows in Texas are complex, both geologically and socially. With few limitations, Texas’s rule of capture allows landowners to pump water from beneath their properties, regardless of the impact on neighbors who rely on the same supply. And in many cases, the decisions of those who use and manage water are hampered by a lack of understanding of how the water flows under the ground.

“We need better collaboration and knowledge-sharing today so that a generation later we’re not trying to figure out how to bring a dry spring back to life,” says Puig-Williams.

“ Without the springs ... this little town will dry up. ”

— Rancher Meg Timmerman

Unsustainable pumping

Fifty miles to the east, another spring system once flowed out of the ground at a rate of 30 million gallons a day. Comanche Springs supported farms that grew pecans, alfalfa and the famed Pecos cantaloupes. In the 1930s, the town of Fort Stockton built an open-air pavilion around two of the spring’s outlets, creating a massive natural swimming pool that attracted thousands of tourists.

But in the late 1940s, upstream farmers began increasing their pumping to irrigate their expanding fields, and Comanche Springs slowed to a trickle.

By 1961, the springs had dried up. The loss devastated not only the farmers and ranchers who depended on the water, but also the town once known as “the Spring City of Texas.”

Now, Fort Stockton is just a gas stop on the way to San Antonio or El Paso,” says Kirby Warnock, a third-generation resident who is secretary of the Pecos County Historical Commission.

It’s a stark warning of what could happen to San Solomon Springs and the town of Balmorhea, worries Dan Mueller, an EDF engineer who works on climate-resilient water systems in Texas. “Without a more thorough understanding of the groundwater that supplies springs and the impacts of increased pumping, shared water resources are vulnerable throughout the state,” Mueller says.

Strong science

In West Texas, where few waterways flow year-round, groundwater is crucial to the region’s ecology and economy. Underground aquifers — and the springs that flow from them — are the primary source of water for farms, communities and rural households, providing more than half the water the state uses

annually. Mueller and other water advocates say that the best chance to build resilience into groundwater resources is to encourage collaboration.

“Until recently, not a lot of people were talking about managing groundwater,” says Mueller. “But there are landowners out there who want to leave a legacy by protecting resources that are important to everyone. We’re trying to engage these people around decision-making using the best available science.”

An EDF case study on a groundwater management district in the hills near Austin highlights approaches to protecting both groundwater resources and landowners’ property rights. The district includes Jacob’s Well, a popular spring enjoyed by swimmers in the Austin area. Despite significant research and conservation efforts, Jacob’s Well ran dry this past summer.

The invisible flows that feed the West Texas springs are even less understood. Geologists suspect that a large part of



BRANDON MULDER

The world’s largest spring-fed swimming pool at San Solomon Springs (opposite) attracts hundreds of thousands of visitors a year. The boom times at Comanche Springs (above in 1938 and, left, today) are now a distant memory.

the San Solomon recharge basin may be in the Davis Mountains and Culberson County to the west — meaning that the spring’s fate may lie not in the hands of local people, but ranchers 50 or 100 miles away. To gain a fuller understanding of the flow paths, researchers will need these landowners’ permission to take samples and measure water levels.

Once a clearer understanding emerges, any management efforts will be complicated by the fact that groundwater districts are generally based on counties, not water flow. “We’ll need to encourage people to work together on a regional basis,” says Mueller.

A comeback for Comanche?

As San Solomon Springs have slowed, there are signs of renewed life at Comanche Springs. The water has begun to flow again in winter months when the aquifer rebounds from summer pumping. That has energized local residents

and several groups working to rejuvenate the spring, including EDF partner Texas Water Trade.

In late 2020, Texas Water Trade published a study assessing the possibility of bringing year-round flow back to Comanche Springs. They’re now engaging with upstream landowners and irrigators, and evaluating incentives and efficiencies to reduce groundwater pumping.

As a road map to restoring Comanche Springs takes shape, EDF is looking at how the learnings can be applied to San Solomon Springs so that the water source that sustains local communities there will continue to flow. Meg Timmerman, a rancher and farmer who grew up in Balmorhea, says her crops and the community’s survival depend on the ability to share a resource that’s essential for everyone.

“Without the springs, we have nothing,” Timmerman says. “This little town will dry up.” ■

“The jungle is life itself.”

By Rod Griffin

Who better to save the rainforests than the people who know them best? In Ecuador, Indigenous communities are leading the way and helping the world address climate change.



RIVERS AND waterfalls are sacred to the Shuar people who inhabit the remote Amazonian rainforest in southeast

Ecuador. For Tuntiak

Katan, the narrow beach where the Shinkiatan tributary merges with the caramel-colored Río Panki is where he feels a deep spiritual connection.

“The jungle is life itself,” he says, as two blue morpho butterflies tango in the dappled light above the river’s surface. “It’s the foundation for our culture.”

This is where, at age 10, Katan had a vision, brought on by floripondio, a potent hallucinogenic plant that his grandfather had given him, a common ritual among the Shuar people. In his vision, Katan saw himself among tall buildings in a big city. At the time, he didn’t know the significance. But for the Shuar people, visions are among the most important events in life.

Thirty-two years later, Katan frequently finds himself among

skyscrapers on the global stage. Vice coordinator of COICA, a leading organization that advocates for the rights of Indigenous Peoples from all nine nations in the Amazon Basin, Katan was a featured speaker at the COP27 climate negotiations last November in Egypt.

His message? If you’re trying to save the rainforests, you have to work with the people who know them best.

Across the globe, 9.3 million acres of tropical primary forests were cut or burned in 2021, releasing climate pollution equivalent to the annual fossil fuel emissions of India.

Indigenous Peoples manage more than 30% of the Amazon rainforest. They typically practice sustainable forest management, through agroforestry and low-impact agriculture. Satellite imagery shows that deforestation rates in Indigenous territories in the Amazon are roughly half of what they are in similar surrounding lands.

But reward for that stewardship is often lacking. Over the last decade, the international community has plowed \$2.7 billion into rainforest preservation with more promised to come. Yet, according to Rainforest Foundation Norway, less than 1% of climate assistance lands in the hands of forest communities.

“We’re finally getting recognition for our role managing forests,” says Katan, “but we need to be seen as partners.”

Fierce defenders

The 60-mile, pot-holed road to Katan’s home village of Tuutinentsa is a jarring, three-hour journey. The road was cut through the dense jungle just four years ago. It brought services, such as health care and education, but also the threat of deforestation. Every few hundred yards, piles of neatly stacked logs line the roadside, evidence of the receding forest.

For Tuutinentsa residents — 300 Shuar subsistence farmers — development comes at a price.

The Shuar people have a reputation as fierce warriors who held out, even as the Incas and later the Spaniards swept across the region. Today, they face an equally formidable enemy in the form of mining interests. So far, they’ve managed to keep those interests mostly out, though the Ecuadorian government has granted mining concessions to half their territory.

“My biggest fear is that we will lose our culture — and with it our resources to be self-sufficient,” says Katan, over a bowl of chicha de chonta, a traditional Amazonian drink made from fermented chonta palm fruit.

A new global initiative, the LEAF Coalition, a public-private partnership for forest conservation EDF helped create, has mobilized more than \$1.5 billion to protect the world’s rainforests (*see story, p. 11*). When the money starts flowing,



International climate advocate Tuntiak Katan near his home community in Ecuador. Indigenous territories like his shelter more than 80% of the world's biodiversity, including jaguars, tapirs and the squirrel monkey pictured below.

IMAGES BY LESLIE VON PLESS



Ecuador is expected to be one of the jurisdictions to benefit.

The challenge now is to ensure the money also reaches communities like Katan's. Over the past several months, EDF has been leading workshops with government officials and Indigenous leaders in the Amazon to help with the development and implementation of forest protection plans.

government clamped down, confiscating more than 100 pieces of heavy equipment. Today, those machines are impounded behind a chain-link fence. But the gold rush continues. Prospectors have brought in other backhoes and are operating in plain sight.

Just southwest of Tena lies Ichu Urku, a small enclave of 14 Kichwa families reachable only by driving through a river

263 Indigenous families are supplying crops to the cooperative, earning income for the community.

Nearby is Laguna Azul, an ecotourism destination run by local Kichwa families. It's paradise, with cascading waterfalls and natural pools formed by a tributary of Río Jatunyacu.

"We Indigenous Peoples living in forests know what we possess," says Jintiach. "By practicing agroforestry and providing ecosystem services, we are part of the climate solution. We are connecting these initiatives to the community, so they will have their own economy."

Paradise lost?

If Laguna Azul is the paradise of the Ecuadorian Amazon, Lago Agrio, in the oil-rich north, is the opposite. Named after the former Texaco headquarters in Sour Lake, Texas, the oil boom town is now better known as a center for drug trafficking. On the five-hour drive from Tena to Lago Agrio, two trucks carrying illegal cargo of logs from the primary forest rumble past. Another transports palm fruit. Clearing forests for oil palm plantations is a growing threat in the Amazon.



An unmarked truck carries illegally harvested logs. Ecuador was the first nation to recognize the rights of nature in its constitution. But tension over land rights remains.

LESLIE VON FLEISS

"Indigenous organizations must be directly involved in decision-making on how funds will be distributed," says Santiago Garcia, EDF's Indigenous Peoples specialist. "It's more than about trees and carbon. It's about people and communities."

"We have two options," says Katan. "We can conserve the forest or cut it down for profit." For him, the choice is obvious. Walking up the trail behind his hut, he points to a small plot of land called aja in the Shuar language, an ancestral food and medicine garden. Ajas are a low-impact agroforestry method that has formed the backbone of food systems for Indigenous Peoples in the Amazon for millennia. "If we take care of the forest," Katan says, "it will take care of us."

Part of the solution

Six hours north, nestled at the foot of the Andes, is the city of Tena in Napo Province. Though less remote, the area is still speckled with Indigenous communities, all under intense pressure from development.

The main threat here is illegal gold mining, which contaminates rivers with toxic mercury. Last February, the

bed swollen from recent rains. Here, Juan Carlos Jintiach, a charismatic Shuar leader and technical secretary to the Global Alliance of Territorial Communities, operates a small farm with his wife and extended family. They grow traditional crops like cacao, plantains and yucca, and balsa trees (known for their carbon sequestration potential and fast growth rates).

Jintiach has been a passionate voice for Indigenous rights for two decades. An outspoken critic of illegal mining, he has received death threats from outsiders driven by greed. "I am willing to die defending the rights of Indigenous Peoples and the forest," he says. "But I do fear for my children."

Jintiach offers a vision for how carbon financing, such as that provided through LEAF, could help save swaths of the Amazon. "We have to provide alternative sources of income," he explains. "Otherwise economic pressures on these communities will make it even easier for mining and deforestation to continue."

Four years ago, Jintiach helped found Asociacion Wiñak, a farm cooperative selling wayusa, a local plant used in tea, energy drinks and medicines. The facility also produces chocolate from cacao. Today,



"Indigenous peoples have had a long journey. We have walked, fought and dreamed. We are now at a key moment for action."
— Juan Carlos Jintiach

The descent from the Andean foothills to the Amazon is breathtaking, with the rainforest unfolding across several thousand kilometers to the Atlantic Ocean. But before long, the dense jungle gives way to a mix of oil infrastructure and cattle operations. The pipeline that snakes alongside the road, bringing crude from A'i Cofán territory over the Andes to a Pacific port, is a constant reminder of oil's footprint. The landscape is fouled by



THE WILSON LEGACY

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



"When people see a photo of the rainforest, they think it is a wild place, distant and unexplored. But it isn't. We live here and are grateful for what the forest provides us." — Ramiro Ortiz

abandoned oil derricks, rusting pipes and chemical settling ponds.

The entire area was once jungle, inhabited by the A'i Cofán people, but the population has dwindled as the land has been fragmented by development. "The A'i Cofán Dureno territory is an island of green surrounded by oil wells and monoculture," says Ramiro Ortiz, 31, a young A'i Cofán leader. After decades of exploitation by oil companies that contaminated streams and threatened forests, the

A'i Cofán community has sealed off its borders, installed Indigenous park rangers and opted for greater isolation. Vigilance is key.

Two years ago, a lawsuit was filed on behalf of nine A'i Cofán girls against Petroecuador, the national oil company, seeking to shut down gas flares due to air pollution. They won in court. The company was supposed to stop flaring months

ago, but when A'i Cofán guardians mapped sites using cell phones they counted 447 still operating. Then last year, when news spread that Petroecuador planned to drill more wells on A'i Cofán territory without consulting the Indigenous community, activists armed with spears shut down the access route.

Despite this, Ortiz remains hopeful. In his village, Dureno, reachable

only by boat, music pulsates from homes, laughter fills the air and children play volleyball in the 100-degree heat. The A'i Cofán are a proud people. The last thing they plan to do is disappear.

In addition to monitoring extractive industries, Ortiz is engaged in seed saving and educating youth about traditional culture. "As an educated person, I can go anywhere in the world," he says, "but my heart, my mind, my feelings belong to this place."

Carbon markets offer Dureno and other forest communities the chance to be rewarded for their stewardship — ending the false choice between earning a living and conserving the rainforest.

A path forward

Today, inhabitants of the Amazon occupy two worlds — one foot planted in a traditional way of life, the other stepping toward the future. What that future will be depends on choices made today, not just by them but by the international community.

"One thing is clear," says Bärbel Henneberger, an EDF consultant with more than 10 years of experience in the region. "More needs to be done to strengthen the rights of Indigenous Peoples. Any climate funds must ensure the highest environmental and social safeguards."

It was a message Katan echoed at this year's COP27 climate conference in Egypt.

"The Amazon is at a tipping point," he says. "It can't recover on its own. The responsibility is ours — everyone's — to protect the rainforest and the planet from climate change." ■

FUNDING FOREST PRESERVATION

"We can't limit climate change to safer levels if we don't keep forests alive," says Steve Schwartzman, EDF's senior director of tropical forest policy. "And we can't do that at the scale and speed the climate crisis demands without the support of the private sector."

At last year's COP27 climate negotiations in Egypt, there was widespread support for LEAF (Lowering Emissions by Accelerating Forest finance), the largest-ever public-private effort to protect tropical forests. The partnership, which EDF helped create, has mobilized \$1.7 billion to support rainforest communities. Early backers include Norway, the United Kingdom and the United States as well as major international companies — such as Amazon, Nestle and Unilever — that are eager to strengthen their corporate emissions-reduction strategies.

While project-by-project approaches to forest conservation have localized successes, the LEAF initiative uses a jurisdictional approach, which overcomes the problem of "leakage" when reducing emissions by protecting one patch of land causes increased emissions elsewhere.

LEAF is focused on results with safeguards to ensure high integrity. Jurisdictions are paid only if they achieve reductions below their five-year baseline of deforestation, encouraging greater ambition over time. Most importantly, the program includes mechanisms to ensure that the people who live in the forest benefit and are engaged in decision-making.

INSIDE Solutions

LIVE WEB EVENT

For the forests, for the people, for the climate

Join us on a trip into the rainforests of Ecuador to hear from EDF and Indigenous leaders on their work to preserve forests, save the climate and protect Indigenous livelihoods and ways of life.

Coming this spring! Learn more and register at edf.org/InsideSolutions

Little wells, big pollution

EDF research reveals that low-producing oil and gas wells — often given a free pass by regulators — are major sources of climate-warming methane emissions.

MELISSA OSTROFF WAS WALKING through Boyce Park, outside of Pittsburgh, Pennsylvania, when she was struck by the smell of sulfur. Bushwhacking her way off trail for a closer look, Ostroff, an advocate with the non-profit Earthworks, quickly found the source — a broken gas well.

Using a special infrared video camera that can spot oil and gas leaks invisible to the naked eye, Ostroff saw a plume of climate-polluting methane spewing from the well, likely accompanied by smog-forming and cancer-causing chemicals associated with natural gas.

There are about 267,000 active oil and gas wells in Pennsylvania. The vast majority are older, less productive wells like this one, which are not covered by the EPA's existing regulations to limit methane pollution. But in 2022, EDF research revealed that nationwide, such wells are responsible for half of all methane pollution from oil and gas wells.

Now, a new Environmental Protection Agency proposal could at last require companies to regularly check for and address pollution from hundreds of thousands of low-producing oil and gas wells nationwide. It could also limit flaring, the practice of burning off natural gas instead of collecting it — another source of methane and air pollution.

Methane's climate power

The methane pollution released worldwide this year is expected to warm the planet more over the next 10 years than all the carbon dioxide released from burning fossil fuels this year.

Research led by EDF has demonstrated that methane frequently leaks from oil and gas sites across the country.

When state and EPA regulators first began developing rules to limit oil and gas methane pollution, they focused on a small number of high-producing, new wells. Smaller, so-called “marginal” wells that produce less than 15 barrels a day were often set aside, despite the fact that they number more than half a million — about 80% of active wells in the country.

“This has long been an area of debate and tension,” says EDF's Jon Goldstein, who directs EDF's state and federal methane regulation work. “Regulators would give these wells a pass, based on the assumption that their small owners couldn't afford to make changes, and that small wells didn't pollute much anyway. But there was no real science behind that.”

In 2022, EDF scientist Mark Omara published research demonstrating just how big the small-well problem actually was. Using measurements collected from six different regions of the country, Omara and his team estimated that each year, small wells emit roughly half the methane emissions from all wells, and will have the same impact on the climate over the next 20 years as more than 80 coal-fired power plants.

What's more, EDF showed that more than three-quarters of these wells are owned by companies that generate hundreds of millions in revenue each year — not exactly mom-and-pop shops.

“If you want a strong policy to reduce oil and gas methane pollution,” says Omara, “then that policy cannot leave out low-producing wells.”

WHAT YOU DON'T SEE CAN HURT YOU

Oil and gas methane leaks often contain multiple harmful pollutants.

METHANE

Speeds up climate change

BENZENE

Causes cancer

SMOG-FORMING POLLUTANTS

Cause asthma attacks and premature death

A simple fix

Once notified, companies of any size can promptly fix most leaks, as they did with the leak Ostroff discovered in Boyce Park.

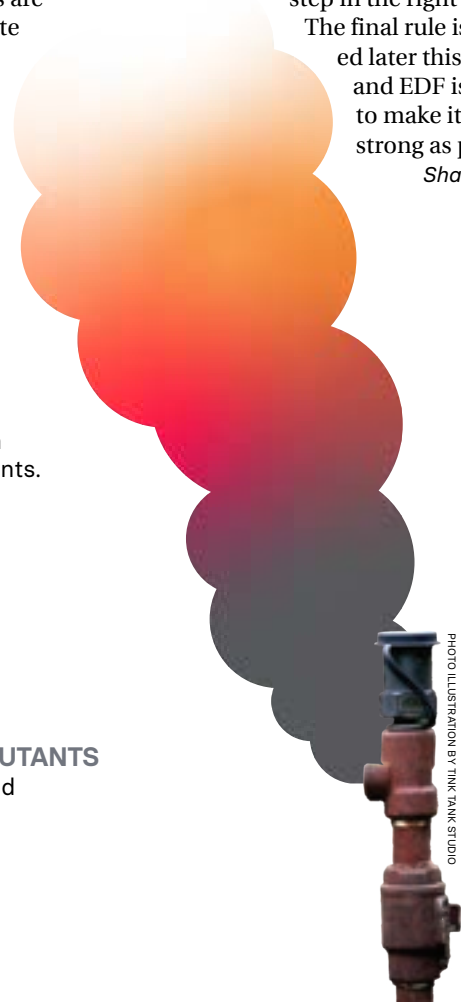
But, points out Vanessa Lynch, who lives near the park and is a field organizer for EDF affiliate Moms Clean Air Force in Pennsylvania, “It shouldn't be up to you and me to find leaks. Companies should be responsible.”

Lynch, EDF and other advocates have been urging the EPA to strengthen oversight of the low-producing wells that dominate the U.S. oil and gas landscape, particularly in Appalachia. Efforts to improve leak detection have stalled in Pennsylvania, where 1.4 million people live within half a mile of an active oil and gas well. “We really need a federal standard that sets a baseline for states to protect frontline citizens,” says Lynch.

The EPA's proposal is a step in the right direction.

The final rule is expected later this year, and EDF is working to make it as strong as possible.

Shanti Menon



A timeline of tenacity

The long road to a game-changing climate win.



first time the government took sweeping action across the economy to cut greenhouse gas emissions and lower the cost of renewable energy. It passed the House — a big step — but died in the Senate.

2021: Build back better

After more than a decade of federal inaction, climate is back on the agenda. The Build Back Better bill includes hundreds of billions of dollars for clean energy and climate programs. The

bill passes the House, but hits rough water in the Senate. In December, pundits and some congressional insiders declare the effort dead.

2022: Success at last

A small group of senators quietly resurrect the climate negotiations from the Build Back Better bill. But their plan falls apart before it reaches the Senate. There is near-universal agreement that a climate deal will not come together. EDF urges everyone involved to not give up and keep negotiating.

On August 7, in a near-miraculous turnaround, the Senate passes the Inflation Reduction Act with climate provisions intact. Five days after that, the House follows, and President Biden swiftly signs the bill into law. It is a massive step in the right direction. The act will give a major boost to renewable energy, accelerate the transition to electric vehicles, slash potent methane pollution from oil and gas operations and cut emissions from the agricultural sector. And it will do all this while creating more than 9 million jobs and making an unprecedented investment toward environmental justice.

“Too often we confuse setbacks with defeat,” President Biden said about the legislation’s long journey to his desk. “Making progress in this country, as big and complicated as ours, clearly, is not easy. It’s never been easy. But with unwavering conviction, commitment and patience, progress does come.”

Joanna Foster

THE INFLATION REDUCTION ACT IS the biggest investment in climate action in U.S. history. The law dedicates \$369 billion to clean energy and climate resilience and is projected to help reduce heat-trapping emissions by 40% by the end of the decade.

But it almost didn’t happen.

Here are five notable near-misses over the past 25 years that led to the act’s success — because climate advocates like you never gave up.

1997: A near miss

The world takes a bold step forward with the Kyoto Protocol — the first international treaty with legally binding obligations to limit emissions. While the U.S. signs on, the Senate refuses to ratify the treaty and a few years later, President George W. Bush announces that the U.S. will not be joining.

2003: Congress capitulates

John McCain (R-AZ) and Joe Lieberman (D-CT) introduce the Climate Stewardship Act. The bill would have instituted a cap-and-trade program to cut emissions from major climate polluting sectors of the economy, including transportation and power production. This bipartisan effort puts the spotlight on climate change in Congress, but doesn’t get enough votes to pass.

2009: Close, but no cigar

The Waxman-Markey bill revives hope for climate action. It would have been the

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Launching leaders

In the 15 years since EDF's Climate Corps® program began, its alumni have become sustainability leaders across the globe.

By Vanessa Glavinskas

CLIMATE CORPS AT A GLANCE

A global network of

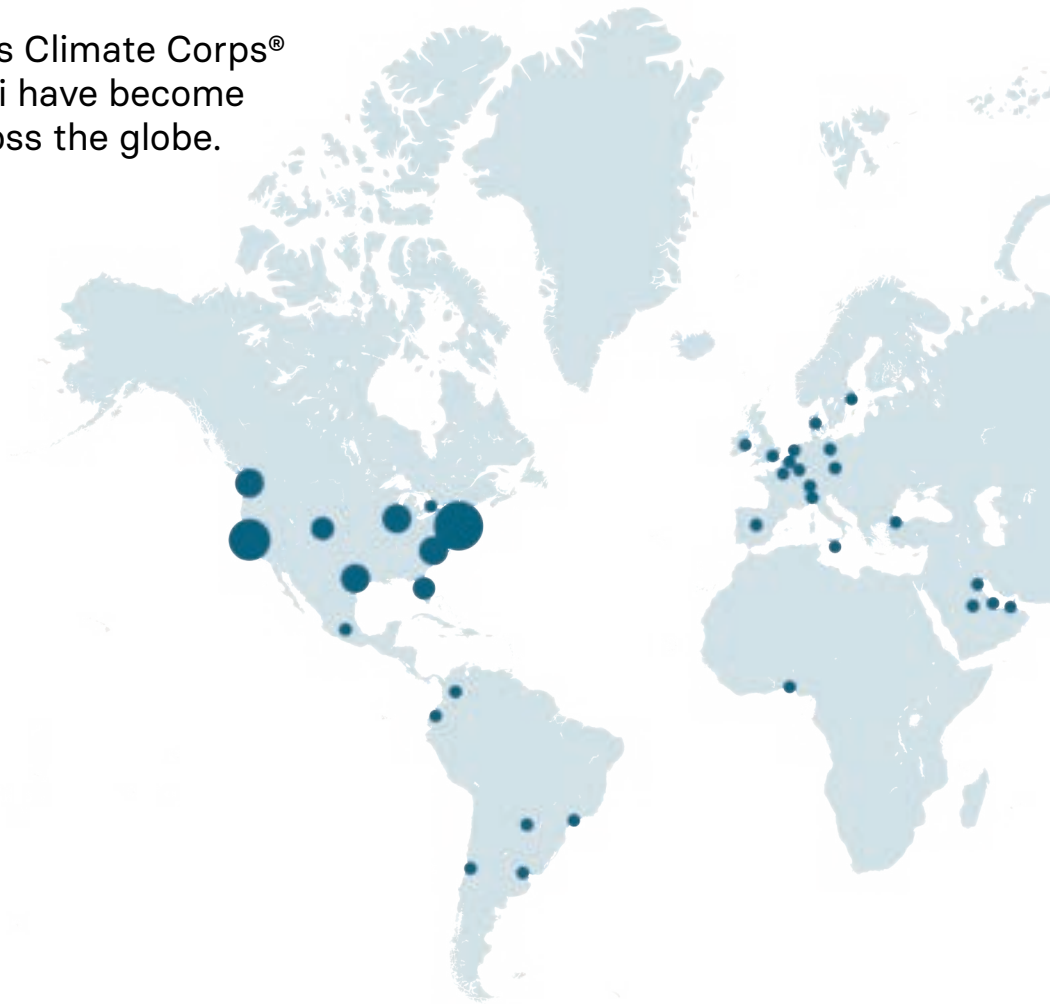
3,000

fellows, alumni & mentors

Finding solutions in

40+

countries



THE FIRST THING INESH SINGH noticed was the dust. “It was horrifying,” he says. “The road was covered in mounds of coal ash starting 10 kilometers away from the plant.”

A mechanical engineer, Singh's first job was to design coal-fired power plants in India. But seeing the toll that burning coal takes on people's health and the environment firsthand shocked him, and he decided to pursue a career in sustainability instead.

In 2015, he moved to the U.S. to pursue a master's degree at George

Washington University in Washington, D.C. On his third day of class, a career counselor who knew about his interest in renewable energy suggested that he apply for EDF's Climate Corps fellowship.

The program — which embeds ambitious graduate students at top-tier companies and organizations looking to become more environmentally friendly — seemed like a perfect fit. “I had my application ready before the system even opened to accept them,” he says.

Singh was selected and spent a summer auditing energy and water usage at PepsiCo's North American man-

ufacturing facilities. Once he finished his degree, Pepsi hired him to work in their global sustainability department.

Today, Singh is in Bangalore, India, where he leads regional agricultural sustainability efforts for the biggest beer company in the world, AB InBev. He and his team have helped more than 2,500 barley farmers develop responsible growing practices and implemented initiatives that have saved millions of gallons of water.

“Climate Corps started with the idea that EDF should put people into companies to look for energy efficiencies,” says EDF's Gwen Ruta, who helped launch the program 15 years ago.

Since then, Ruta says the fellowship has grown to be much bigger than she initially imagined.

About 1,500 students have gone through the program, and today's fellows work on everything from food waste to environmental justice, in addition to energy efficiency. Fellowship alumni are known to stay in touch and support one another, and almost all of



Inesh Singh

Then Climate Corps fellow at PepsiCo in White Plains, New York

Now Associate Director working on sustainable agriculture for AB InBev in Bangalore, India



them still work in sustainability — with many in leadership roles at prominent companies across more than 40 countries.

While the program initially deployed students only to companies in the United States, it expanded into China in 2014 and India in 2021. Together, these three countries represent almost half of the world's greenhouse gas emissions.

Singh's experience with Climate Corps came full circle when the program expanded into India and he hosted two students at AB InBev.

"Climate Corps was the start of my own sustainability journey, and I knew these fellows would add value to our team," Singh says, adding that AB InBev has already implemented some of the carbon-reduction strategies the fellows suggested into their processes.

"I had high hopes for them, and they delivered," he says. ■



Zukhruf Amjad

Then Climate Corps fellow for the city of Trenton, New Jersey

Now Working on East Africa's energy transition for the World Bank out of Washington, D.C.

When Zukhruf Amjad read that catastrophic flooding had devastated Nowshera, Pakistan, a town just a few miles from where her family lived, she struggled to hold back tears. "People with zero role to play in climate change — who may not even know about the global systems leading to these problems — are facing the brunt of it," Amjad says, adding that Pakistan is responsible for less than 1% of global emissions. A desire to address that unfairness motivates Amjad in her work with the World Bank, a position she got after completing EDF's Climate Corps fellowship in 2020. "This is a way to help countries like mine receive proper assistance to overcome the unequal impact of climate change," she says.



Adam Ostaszewski

Then Climate Corps fellow at SC Johnson in Wisconsin

Now Energy Data Officer for the U.N.'s International Organization for Migration (I.O.M.) in Geneva, Switzerland

In 2010, Ostaszewski was a Climate Corps fellow at SC Johnson in Wisconsin, helping identify decarbonization projects. Today, he is in Switzerland working on the U.N. migration agency's transition away from fossil fuels across 160 countries. "Much of the U.N.'s humanitarian work is in places where grid resources are of poor quality or aren't available, so the sector relies on fossil fuels like diesel generators," Ostaszewski explains. "That is both a problem and an opportunity. I'm focused on finding ways to improve the resiliency of I.O.M.'s operations by switching to solar or other renewables."



Shuyi Li

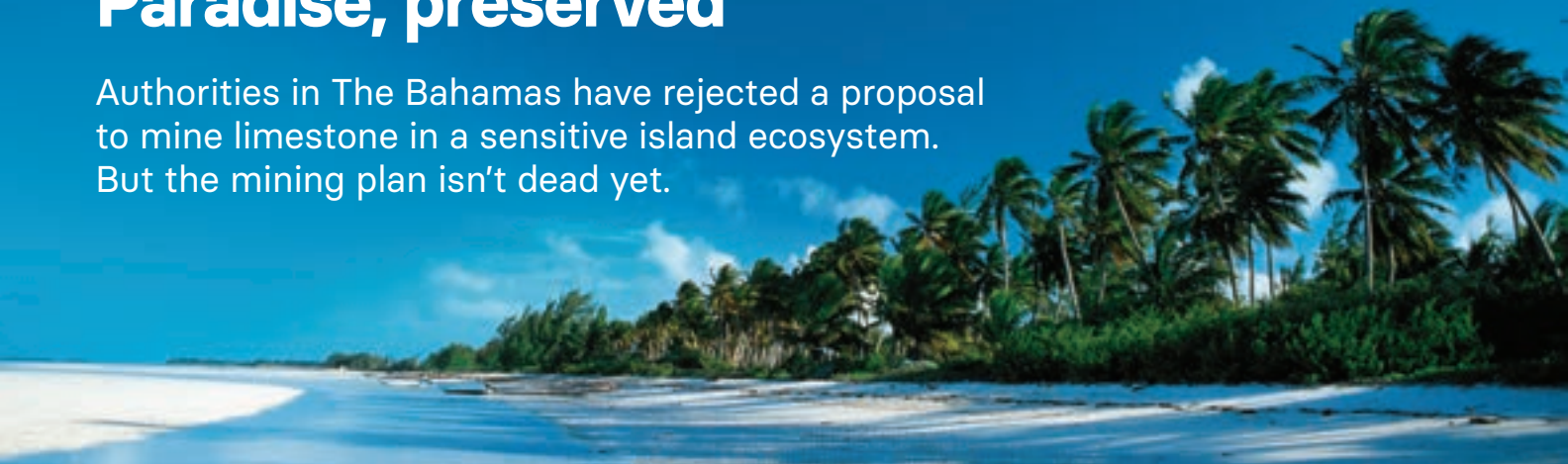
Then Climate Corps fellow at IKEA in Shenzhen, China

Now Driving ambitious carbon reduction in China as a manager at RMI, Beijing

Shuyi Li spent her Climate Corps fellowship helping IKEA's suppliers reduce their reliance on coal. She now helps China's heavy polluters like the steel and cement industries to reduce their greenhouse gas emissions as a manager for RMI in Beijing. She also co-authored a report that created a decarbonization roadmap for China's largest emitters, which is helping to guide the country's leaders in their goal of reaching carbon neutrality by 2060. "We found that with the development of new technology and economies of scale, it is achievable for even the hardest-to-abate sectors to decarbonize," Li says. "There's a lot that remains to be done," she adds. "But I enjoy finding solutions that are not just good for us, but also good for our planet."

Paradise, preserved

Authorities in The Bahamas have rejected a proposal to mine limestone in a sensitive island ecosystem. But the mining plan isn't dead yet.



GETTY

THE CRYSTALLINE SALTWATER FLATS around the island of Andros, The Bahamas, are filled with lightning-quick bonefish that beguile sport fishers. Vast nurseries of knotty mangroves and seagrass beds shelter baby spiny lobster, snapper and other juvenile fish. Its barrier reef, the world's third largest, is home to more than 164 species of coral and fish. And the island's pine forest supports rare birds, including the critically endangered Bahama oriole.



STAFFORD CREEK LODGE

Prescott Smith, angler extraordinaire.

"I can reach outside right now and pluck an avocado," says Prescott Smith, a fly-fishing guide and local conservationist who is one of about 8,000 Andros residents. "This place is really a paradise."

Andros is also where the Bahamas Materials Company has proposed a 5,000-acre limestone mine that could put this precious ecosystem at risk.

Mining for limestone, which is widely used in construction, is a multibillion dollar industry. It has been associated with water contamination and scarcity, soil degradation, air pollution and sink-hole collapses.

Smith is one of several Bahamian environmentalists who have been speaking out against the mine. "This will be devastating to fishing," he says.

In a June 2022 letter to the prime minister, Smith, EDF and others detailed their concerns about the potential impacts of the mine on the environment and the 500-plus local jobs that depend on healthy land and seas.

In August, these efforts seemed to pay off. The Bahamas Investment Authority rejected the proposal — a surprising move for an agency created to smooth the way for investors. But celebrations of the victory could be short-lived. The company has said it will continue to pursue the project, which has other avenues for approval.

BMC has been campaigning intensively for community buy-in on Andros. The company's promotional materials promise to create 151 permanent jobs and an estimated \$1 million in community development funds. In 2020, it donated a firetruck to the local government in North Andros.

Battling mining misinformation

Many people in The Bahamas are not aware of mining risks, says Smith. To help the community make an informed decision, EDF and the nonprofit Community and College Partners Program reached out to the American Geophysical Union's Thriving Earth Exchange and found Sophie Huss, a Michigan State University geologist who studies sustainable mining.

Huss is now leading a team of seven volunteer scientists to develop an environmental impact brief on the project. She's participating in information

sessions for community members, as well as meeting with local and national officials, to discuss the potential impacts of the mine.

A major concern is the risk to Andros' freshwater lens, an underground formation that is the largest freshwater resource in The Bahamas. Fresh water is increasingly threatened across the Caribbean, due to sea level rise and hurricane-induced storm surges, which bring saltwater into the system.

At a proposed depth of 80 feet, mining would break through the lens, opening it to contamination. And because Andros' limestone land base is porous and riddled with caves, "pollution can travel through very easily," says Huss. Polluted groundwater would enter streams and then flow out to coastal waters, contaminating the coral reef, mangroves and sea grass beds on which more than 100 fish species — and thousands of people — depend.

Community-based conservation

The mine's supporters on Andros say it offers a rare opportunity for economic development. But Smith and others see a future based on sustainable use of Andros's natural resources. Smith has trained hundreds of fly-fishing guides in The Bahamas, helping build a \$170 million angling industry, and has founded three nonprofits dedicated to conservation and education.

"People prey on communities who are not aware of what's at stake," Smith says. "True conservation is about equality. When people realize they can earn a living from a sustainable use of the environment, they will protect those resources."

Shanti Menon

The expert next door

CHERYL WATSON HAS LIVED FOR 60 years in the same bungalow where she grew up in Chatham, on the south side of Chicago. For most people, losing electricity is an inconvenience, but in a community such as Chatham, a power outage can quickly become a crisis.

“Houses around here didn’t need AC when I was growing up, but now climate change means they do,” says Watson. “When we lose power in the summer, it can become a medical emergency for older folks like me.” Chronic disinvestment in Chatham compounds these risks. “If there’s even a little rain, the neighborhood floods and you’re trapped, and the nearest decent hospital is miles away.”

What’s worse, communities like Chatham are more likely to experience a dangerous power failure. In Chicago, power outages are 83% more frequent, and last 140% longer, in low-wealth areas and communities of color compared to whiter, wealthier communities.

These disparities are perpetuated when community members don’t have a seat at the table when energy decisions are being made. EDF attorney Christie Hicks is supporting community efforts to get community voices into the room where it happens.

Utilities are regulated by small, technocratic bodies called public utility commissions. Often composed of three to five members appointed by the governor, they control what rates utilities can charge, how they distribute costs between residential and industrial customers and what energy infrastructure they can build.

People who submit testimony during a commission’s public hearings are generally engineers, economists, scientists, “or someone else with a lot of letters after their name,” says Hicks.

There’s no legal reason why a community member can’t testify. But there are a lot of barriers.

“You need an attorney, you have to understand this really nuanced body of law, and make sense of some truly arcane language and procedures,” says Hicks. Plus, it’s not how things have

For decades, the communities most affected by energy utilities’ actions have been excluded from the regulatory process. Until now.

historically been done at these slow-to-evolve commissions.

“ If people from frontline communities, who are the keepers of their community’s history, are not at the table, then history is destined to be repeated. ”

— Cheryl Watson, community advocate

Hicks is developing a system for collecting and incorporating testimony from community members into public utility legal proceedings. It’s a little like collecting citizen science, but in a legal context. She’s researching different techniques that community members can use to document what is really going on in their communities, like the lingering effects of shuttered fossil fuel facilities. Hicks and her team are also evaluating cases where this kind of testimony will have the biggest impact.

“The goal is to have lived experience in an impacted community recognized as a legitimate form of expertise,” says Hicks.

Her initial efforts are already paying off. Hicks recently worked with Watson to submit testimony in a case about evaluating utility performance. The commission sided with Watson and EDF and will require the utility to provide data that will clearly show if certain neighborhoods are receiving less reliable service than others. And the utility will have a portion of its profits tied to how it performs, based on these equity-focused numbers.

“It all begins with who is at the table when decisions are being made,” says Watson. “If people from frontline communities, who are the keepers of their community’s history, are not at the table, then history is destined to be repeated.”

Changing how utilities do business takes a lot of work and isn’t going to happen overnight, says Hicks. But she is motivated by the community leaders she works with, who are relentless in their push for progress.

“As one of my community members likes to remind me,” says Hicks, “it ain’t over till we win.”

Joanna Foster



Cheryl Watson in front of her home in Chicago’s Chatham neighborhood.

Five ways America's historic climate law can save you money

WANT TO LIVE GREEN FOR LESS GREEN? THE FEDERAL Inflation Reduction Act (IRA), passed last summer with EDF's help, allocates \$369 billion to address climate change and promotes lower-carbon living using a combination of rebates and tax credits. Check out these five places around your home where you can start saving money now.

1 Your driveway

The legislation provides qualifying buyers with up to \$4,000 in tax credits for buying a used electric vehicle and up to \$7,500 for a new EV. These credits are available for some models now. In 2024, they'll be issued through dealerships at the time of sale. There are caveats. For example, EVs must have final assembly in North America to qualify, so some brands won't be able to offer credits until they start up their North American assembly operations.

2 The kitchen

U.S. gas stoves leak as much climate pollution (in the form of super-polluting methane) as about 500,000 gasoline-powered cars. Not only that, researchers recently discovered that gas stoves release the carcinogenic chemical benzene, which is linked to a multitude of health problems.

So, if you're thinking of buying an electric stove, oven or range, the climate law has got your back: a rebate of up to \$840.

3 The laundry room

Heat-pump clothes dryers, popular in Europe but rarely used in the U.S., are an energy-efficient alternative to traditional models. They take a bit longer to dry your clothes but use only about half the electricity. Qualifying households can get a rebate of up to \$840.

4 The thermostat

Looking for a more energy-efficient way to cool and heat your home? Consider a heat pump, a heating and cooling system that transfers heat between your home and the outdoors and can save you hundreds of dollars each year on energy costs. Most households can qualify for a tax credit of up to \$2,000; families with low incomes can get even more — as much as \$8,000 per installation.

5 Your roof

There has never been a better time to add solar panels to your home. The new law provides tax credits of up to 30% to households that invest in clean energy; the credit is retroactive to the beginning of 2022. The average cost of a residential solar system is about \$19,000, so that's \$5,700 in savings. Most people recoup the cost of installing a solar-powered system within 12 years through savings on electricity.

Vanessa Glavinskas



PHOTO ILLUSTRATION BY TINK TANK STUDIO

Take action Find out how much you can save at rewiringamerica.org/app/ira-calculator

★ YOU GOT THIS DONE!

Life is a (low-waste) picnic

THIS FALL, WHEN ABOUT 450 members of the Immaculate Heart of Mary Catholic Church in Atlanta gathered for their annual church picnic — complete with a whole roast pig and tacos galore — there wasn't much left over to throw out.

That was all according to plan, says Jay Bassett, a retired U.S. Environmental Protection Agency staffer who's helped organize the low-waste event since 2019. "We've done a lot of outreach to the folks who prepare and deliver the food about creating as little waste as possible," he says. "We donate our extra food. We have compostable plates, cups and utensils and a composting partner."

The low-waste event is part of an effort to fulfill Pope Francis' 2015 call "for a new dialogue about how we are shaping the future of our planet." The Archdiocese of Atlanta was the country's first diocese to create an action plan to help area churches, schools and north Georgia's 1.2 million Catholics reduce their environmental impacts. The plan encourages everything from energy conservation and rainwater harvesting to lobbying public officials in support of the environment.

Nikki VanDerGrinten, who heads Immaculate Heart of Mary's creation care action team, had introduced



Jay Bassett (left) with other Atlanta volunteers.

recycling at the picnic in 2017. But the Atlanta action plan got her thinking. "Talking to Jay, that gave me the idea for composting, and we got to work." ("First," Bassett says, "I had to convince the deacon that we weren't going to make a mess of it.")

Rather than distribute trash and recycling containers throughout the picnic site, the group created one central waste station and helped parishioners sort their leftovers into separate recycling, composting and landfill bins. Styrofoam plates were banned. In the first year of the group's low-waste effort,

the picnic produced 448 pounds of waste, 85% percent of which was composted or recycled, with 67 pounds destined for the landfill. By 2022, they were down to only 298 pounds of waste, 89% of which was composted or recycled. Now the group is aiming to create policies for other church events, like weddings and banquets, so its low-waste efforts will continue year-round. "One of the themes of Catholic social teaching is care of creation," VanDerGrinten says. "We're just trying to put that into practice."

Liz Galst

? YOUR QUESTIONS, ANSWERED

I want to get my girlfriend some chocolate for Valentine's Day. But I've heard the industry can cause deforestation and soil pollution and has a child labor problem, too. **How can I find her something that's good for the Earth and the people who produce chocolate?**

Amy Prince, New York



Well, Amy, The Chocolate Collective advocacy coalition has some sweet news for Earth-friendly chocolate lovers like your girlfriend — and the lovers of chocolate lovers, too. (That would be you.) The Chocolate Scorecard (chocolatescorecard.com), created by the Collective and available in 12 languages, has the answer to questions like yours. The scorecard rates major brands on issues such as deforestation and climate, agrichemical management and child labor. With people in America likely to spend more than \$2 billion on Valentine's Day candy this year, The Chocolate Scorecard allows you to show both your sweet-heart and the planet some true love.

EDF did not participate in the creation of this scorecard and has not reviewed The Chocolate Collective's research

WE'RE ALL EARS

Got an environmental question you want answered or a success story, like the low-waste picnic above, to share? **Let us know at editor@edf.org.**



“ We must see the jungle as our mother ...
without the jungle, without the forest,
there is no life for us. ”

— Lourdes Jipa,
President of the Quijos Nation of Ecuador