

SOLUTIONS



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Defense
Fund

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Your voice matters

4 reasons we all must vote this November.

INSIDE: EPA bans killer chemical | States make strides on climate | Innovative African farmers

India's pink buses go green

India's female-only pink bus system already offers safer public transportation for women. Now, pink buses in the central Indian city of Indore are going electric. It's an action advocated for by the Clean Air Catalyst partnership, a global program EDF co-leads that is focused on locally tailored solutions to air pollution. Many of Indore's electric bus charging stations are powered by solar energy. That means the energy-efficient buses don't just reduce air pollution — a major problem in this city of 3 million people — they also do double duty in the fight against climate change.



The future depends on us



As I write this, we are at a pivotal moment, both in U.S. history and in the fight against climate change.

I'm not going to sugarcoat it. What happens over the next five years is of profound importance if we are to head off the worst effects of a warming world.

The good news is we have been moving in the right direction. Under President Biden's leadership, hundreds of billions of dollars in new federal money for climate action, clean energy and infra-

structure became available through the Bipartisan Infrastructure Law and Inflation Reduction Act. Together, these laws are expected to put the U.S. within reach of its climate goals, while saving people money and creating hundreds of thousands of new jobs.

A recent report from the U.S. Department of the Treasury showed that more than 3 million households have already used the Inflation Reduction Act to save \$8 billion on solar panels, heat pumps and other clean energy upgrades.

And in April, the Environmental Protection Agency strengthened a slew of initiatives to ensure that our air and water are safe, targeting harmful pollutants and promoting cleaner vehicles and renewable energy.

I cannot overstate the importance of this progress. These measures are vital for our planet and our health, and I want to extend my heartfelt gratitude to President Biden for his leadership and commitment in this area.

None of this progress was inevitable. It happened because people like you supported action, and our elected leaders respected science and made our health and the health of our planet a priority.

It would be a multigenerational tragedy if this progress were to end. So, I'm taking this opportunity to encourage you to vote. (If you need information on how to register, visit edf.org/vote.) Your participation in the democratic process in the days ahead might be the greatest chance you will ever have to protect the progress we've made so far. (See p. 8.)

That said, our mission to protect the planet and fight climate change transcends political cycles. We at EDF drive progress through powerful partnerships with businesses, state and local governments and others. We know this approach works because we've already seen the impressive results. (See p. 6.)

Still, the leaders we choose right now are of profound importance. I know that I, personally, will be choosing candidates who will help us go further, together.


Fred Krupp, EDF President

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A leap forward for market-driven forest preservation

The U.S. government is putting its weight behind EDF-supported efforts to define “high-integrity” carbon credits, which can channel private capital to cut greenhouse-gas emissions. In May, the Biden-Harris administration announced guidance to make voluntary carbon markets more transparent, equitable and effective.

These markets allow companies to buy credits tied to emissions reductions or projects, such as tropical forest restoration efforts, that remove carbon from the atmosphere. The guidance is nonbinding but is expected to boost voluntary carbon markets by giving companies more confidence in such purchases. It should also help consumers vet companies’ claims that they are helping the climate by purchasing carbon credits.

Investing in carbon credits shouldn’t replace companies’ efforts to cut climate pollution from their own operations and supply chains. But these credits could provide billions of dollars to lower-income countries to help them keep their forests intact, something that’s essential to meeting the world’s climate targets. Purchases in the global voluntary carbon market reached \$1.7 billion last year, but improved standards and regulations could expand the market to \$1.1 trillion by 2050.

“‘High integrity’ means that these credits deliver verifiable and quantifiable emissions reductions for projects that wouldn’t have happened otherwise,” says EDF’s Angela Churie Kallhauge, whose work focuses on using economic approaches to achieve ambitious climate solutions. “This is a big step forward on the path to ensuring that every dollar invested in voluntary carbon markets translates into real climate action and benefits for communities worldwide.”



Let’s reflect the science

Solar radiation modification — reflecting sunlight back into space to cool the planet — is attracting growing interest as more people seek relief from the impacts of climate change, such as melting sea ice, floods and heat waves.

Private companies, governments and philanthropies are increasingly discussing the feasibility of efforts such as making clouds brighter or sending tiny reflective particles into space.

“It might sound like science fiction, but the technology isn’t entirely out of reach,” says EDF’s Associate Chief Scientist Lisa Dilling. Dilling urges caution. She is leading a new EDF initiative to coordinate a broad scientific inquiry into SRM’s potential impacts on areas such as agriculture, ecosystems and water supply.



EDF urges caution on unproven technologies to cool the planet.

GETTY

“We need to learn more before any action is seriously considered,” says Dilling. “We want to bring solid, scientific information to the table, and out in the open, so policymakers are prepared for any future decisions.”

Dilling is quick to point out that, even if it were used in the future, SRM is no substitute for cutting climate pollution. “That’s still job one at EDF,” she says.

Houston, we have a winner!

The EDF-sponsored Environmental Youth Council video contest motivates Houston high school students to explore answers to local clean air and climate problems. “It is amazing how students present such important information in so many entertaining ways,” says Program Manager Shannon Thomas. This year, 138 students from 14 schools participated. The first-place winner? A reel aptly titled, “Breaking news: Houston, we have a problem!”



VIEW this year’s winners at enviroyouthcouncil.org



SCREENGRAB FROM STUDENT FILM [HTTPS://YOUTU.BE/7ZTZ1Zn8R4](https://youtu.be/7ZTZ1Zn8R4)



Activists display photos of people who have died from exposure to methylene chloride, including Kevin Hartley.

BEN MCCANNA/GETTY IMAGES

EPA bans killer chemical methylene chloride

WENDY HARTLEY HAD JUST GOTTEN off a plane in Dallas, Texas, when she broke down in tears.

“I turned my cell phone on and saw that I had a voicemail from Michal Freedhoff,” Hartley says.

Freedhoff is America’s top chemicals regulator. Chosen by President Biden to improve the way the federal government protects the public from dangerous chemicals, she was calling Hartley personally to let her know that the Environmental Protection Agency would ban most uses of methylene chloride, the chemical that had claimed the life of Hartley’s 21-year-old son, Kevin, seven years ago.

As she listened to the message, tears streamed down her cheeks.

“I just couldn’t believe that someone listened to me. My voice. Kevin’s story,” Hartley says, her voice breaking.

“Someone actually listened, and now others won’t have to go through what we went through.”

A devastating loss

In 2017, Kevin Hartley was refinishing a bathtub at work using a paint stripper containing methylene chloride when the fumes overcame him, sending him into cardiac arrest. He was found slumped over the tub and later died at the hospital.

Methylene chloride has been used to strip paint and clean metal for decades, even though experts, including health scientists at EDF, have long called for it to be banned due to the dangers it poses.

“Methylene chloride is a highly toxic chemical,” says EDF’s Lindsay McCormick, an expert in chemical safety.

“Not only can long-term exposure cause cancer, but high levels can depress the central nervous system and result in death, often in a matter of minutes.”

There are dozens of documented deaths associated with methylene chloride. In high concentrations, it robs the brain of oxygen. Methylene chloride paint strippers were taken off store shelves and out of workplaces across Europe at the end of 2010 due to this risk but have remained available in the U.S. for years.

EDF experts have been supporting the advocacy of families who had lost loved ones to this deadly chemical, including the Hartleys, with the aim of banning its use altogether to protect American workers and families.

“I had never done any political advocacy before Kevin died,” Hartley says. “So I felt like a fish out of water. But EDF guided me along and helped me.”

On April 30, that advocacy paid off when the Environmental Protection Agency finalized a rule allowing only “critical” uses of methylene chloride to continue — all consumer uses and most commercial uses will be phased out over the next two years.

A lifesaving legacy

“There are still so many workers who use paint strippers every day,” Hartley says. “I’m just relieved that, finally, there’s a rule to protect them so others won’t have to go through what my family went through.”

When she talks about her son, Kevin, Hartley is quick to point out how much he loved to help others. And that, at the time of his passing, he was an organ donor.

“Kevin saved four lives as an organ donor,” Hartley says. She’s even met the recipients of his heart and lungs. “And now he continues to save more lives with his story. That’s his legacy.”

Vanessa Glavinskas



Wendy Hartley (right) and fellow advocate Cindy Wynne in Washington, D.C.

ANDREW REAGAN



Texas-style trucking

There's more than one way to make environmental progress.

TRUCKS ARE A MAJOR SOURCE OF climate and air pollution, and California is leading state efforts to clean them up. Thanks to an array of incentives, investments and standards, California has more clean trucks on its roads than any other state. Sixteen other states have joined California to work together on plans to reach 100% zero-emission vehicles.

Texas is not one of them. “We like to do things our own way,” says Phillip Martin, who manages EDF’s clean trucks work in Texas. “Texas is unique.”

But EDF finds ways to make environmental progress, no matter the prevailing political winds. As we work across the country to accelerate a clean truck revolution, we’re not leaving Texas — the second largest truck market in the U.S. — behind.

Big trucks, big impact

Large trucks and buses make up fewer than 10% of the vehicles on U.S. roads

but are responsible for about a quarter of climate pollution from transportation, as well as nearly half the nitrogen dioxide pollution. (Nitrogen dioxide is linked to asthma, heart disease and cancer.)

In 2020, after successfully advocating California’s groundbreaking Advanced Clean Trucks rule, EDF saw an opportunity in Texas. Several regions with heavy truck traffic were failing to meet national air quality standards. The state had programs to clean up diesel vehicles, but they didn’t prioritize electric trucks. Yet with low-cost electricity, growing renewable energy and a business-friendly environment, Texas offered fertile ground for electric trucks to take off.

“Texas is a market-driven state,” says Martin, a 20-year veteran of Texas politics. “We know electric trucks are a superior product, and the market will ultimately move in this direction. We just needed to open the door.” EDF’s goal

is to make Texas a national leader in the adoption of zero-emission trucks by 2030.

Tapping into that existing state programs would be a first step toward helping the new technology take root.

Finding common ground

EDF met with Texas state environmental officials and began building support for electric truck funding. Martin found an ally in Sysco, the global food distribution company. Sysco was building a fleet of electric trucks worldwide, but had yet to bring any to Texas.

In 2022, those efforts resulted in \$8 million dedicated toward purchasing electric trucks. The state will award an additional \$83 million over the next two years.

“When we work together, our collaboration gives us a lot of weight.”

— Trae Camble, Port Houston

This year, Sysco used its funding to roll out 10 electric trucks in Houston, expanding its electric fleet to 120 rigs. Frito-Lay, another grant winner, is building a fleet of electric delivery trucks for its distribution center in Dallas-Fort Worth, where plans are also underway to develop the state’s first commercial electric truck charging facility. Peterbilt, which builds electric trucks in Denton, Texas, recently received a big order for 150 new electric semis.

Texas now has more than 60 electric trucks on the road, compared to a handful in 2020, and more than 400 additional trucks on order. That growth puts Texas “solidly in the upper middle of the pack” of states rolling out electric trucks, says EDF’s Marissa Nixon, who tracks company announcements of clean truck orders and deployments nationwide.

Cleaning up the dirtiest vehicles

For maximum environmental benefit, priority should go to replacing trucks in areas where people are exposed to multiple sources of air pollution.

According to the U.S. Climate Vulnerability Index, developed by EDF and partners, communities near the port of Houston are among the most exposed in the nation to pollution from traffic,

refineries, petrochemical facilities and other industrial activities. Ten thousand trucks rumble through the port complex every day.

EDF worked alongside local environmental justice groups and Port Houston, which owns and operates the public wharves along the Houston Ship Channel, to develop a clean truck program that can tackle local air pollution from these trucks.

Most of them are owned by small companies or owner-drivers that lack the wherewithal to purchase cleaner vehicles.

With EDF's help, Port Houston won funding from the 2021 Bipartisan Infrastructure Law to buy 30 electric trucks on behalf of these small owners. An even larger grant, expected in September, would add 250 more. In total, these new trucks are expected to cut more than 17,000 tons of harmful air pollution in the region — not only nitrogen dioxide but particulate matter and volatile organic compounds, too.

“EDF was a huge help,” says Trae Camble, Port Houston's director of environmental affairs. “Port Houston and EDF share the same goal of reducing emissions in the region. When we work together, our collaboration gives us a lot of weight.”

What's next

EDF is working alongside state agencies, utilities and businesses to deliver reliable charging, streamline funding programs, and advocate a new state policy to ensure that electric trucks replace the dirtiest trucks on the road. Typically, companies must scrap an old truck to access government incentives. But many big fleets don't own trucks old enough to qualify, and companies with older trucks lack expertise to handle the application process. A new policy would allow large electric truck purchasers to transfer their used, but relatively cleaner trucks to smaller companies, which would scrap their much dirtier trucks instead.

“Clean trucks in Texas benefit our economy and our environment,” says Martin. “We are going to pursue the right policies and make smart investments to find a Texas solution that works for everyone.”

Shanti Menon

More action from coast to coast

EDF is on the ground, across the country, helping cut greenhouse gas pollution and build resilience to climate change at all levels of government. We work in states that have long been climate leaders and states that are playing catch-up.

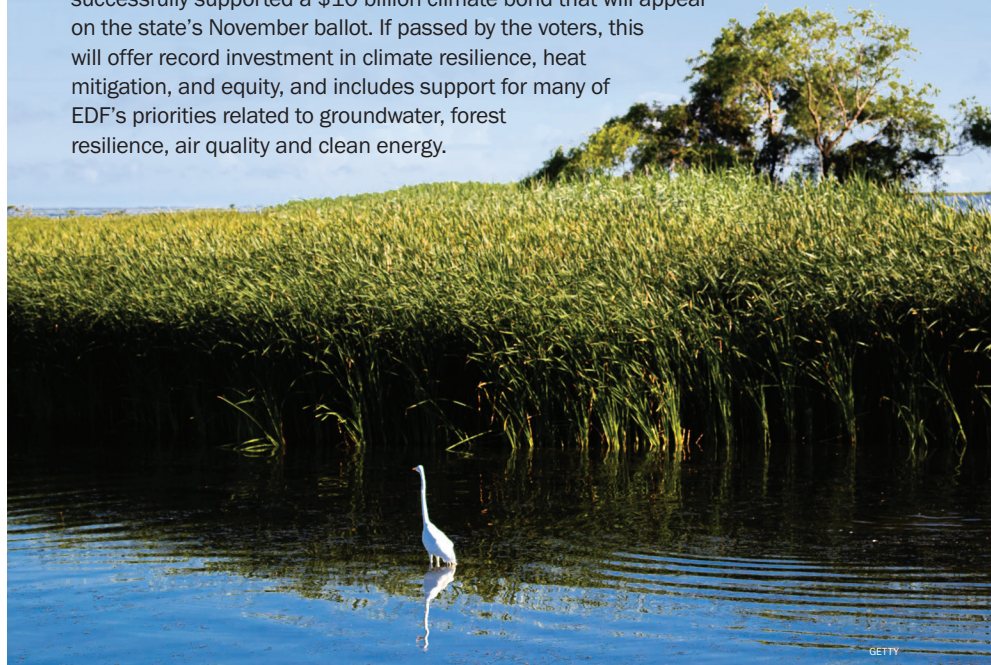
“States are the incubators and implementers of policy innovation as we chart a course for a cleaner, safer and healthier future,” says Hawley Truax, EDF's vice president for political affairs.

In **Florida**, we led a bipartisan effort that resulted in a provision in the state budget that will provide \$346 million in Inflation Reduction Act funds for energy efficiency programs — a big win for the Sunshine State, where Governor DeSantis has rejected this funding in the past. The program is projected to slash greenhouse gas emissions and save residents up to 50% on their energy bills. We also helped pass a new law that will give prospective homebuyers vital information about a home's flood risk — a risk that is growing as Florida's flooding problem gets worse due to climate change. Sellers will now have to disclose if they have filed a flood insurance claim, and whether they have received federal financial assistance due to flood damage to their property.

In **North Carolina**, we helped renew the state's conservation tax credit program, restoring financial incentives that support the permanent protection of forests, wetlands, flood plains and other ecosystems. Such ecosystems are environmental powerhouses, protecting communities from flooding, preserving wildlife and absorbing climate pollution. We're also taking a stand against Duke Energy's plan to build 10 new gas plants over the next 10 years. It's one of the largest proposed investments in new fossil fuel power plants anywhere in the country and would lock North Carolinians into a dirtier and more dangerous future.

EDF and partners in **Arizona** defeated industry-sponsored legislation that would have perpetuated groundwater depletion across most of Arizona, while an EDF-led coalition helped build momentum to tackle water shortages in rural communities.

In **California**, EDF was a leading partner in a large and diverse coalition that successfully supported a \$10 billion climate bond that will appear on the state's November ballot. If passed by the voters, this will offer record investment in climate resilience, heat mitigation, and equity, and includes support for many of EDF's priorities related to groundwater, forest resilience, air quality and clean energy.



Your vote matters

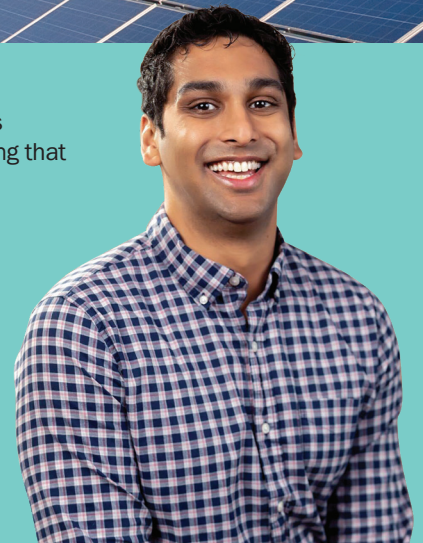
By Liz Galst



We asked: What's motivating you to vote this fall? Here's what you told us.

“ We've made meaningful progress fighting climate change. Continuing that progress motivates me to vote.

Anuraag Jhavar, California



This year, more than ever: Four reasons every voter must head to the polls.

WHEN 33-YEAR-OLD ANURAAG Jhawar of San Francisco steps into the voting booth on Election Day, November 5, one thing will be top of mind: Mira, his infant daughter born this July. “What is the world that she and her generation are going to inherit?” he asks.

Like so many parents, he wants a safe environment for his child — clean air and water, a stable climate. But there are obvious reasons for concern: This summer, after 13 months of record-breaking heat, the Earth experienced the three hottest days on record. A few weeks prior, Hurricane Beryl slammed into Houston, killing at least 36 Texans and leaving millions without power, some for more than a week. It was the earliest Category 5 storm on record.

In the next few years, our elected officials will be making crucial environmental decisions. Whether we have cleaner air and water and more clean energy jobs, or pay increasingly higher costs from dangerous storms, wildfires and droughts depend, in part, on voters’ choices in the coming days.

If you think “every vote matters” sounds clichéd, consider this: In 2022, the winner of a New Hampshire House of Representatives race came down to a single vote. That same year, in a Congressional contest, an environmental champion edged out a former gas industry lobbyist by only 2,004 votes, out of 253,000 cast.

Surveys show many environmentally minded voters don’t make it to the polls. So make sure you know your polling place, have a plan for how you will cast your ballot and encourage others to do the same — you could even make a plan to vote together. (If you haven’t yet registered, in many states, there’s still time. Visit edf.org/vote to register, confirm your registration, find your polling place, learn about voting rules and more.)

As EDF’s General Counsel Vickie Patton says: “Voting is crucial. It can determine the strength of our public health and environmental protections, whether we have leaders who will address climate change, officials who ensure we have clean air and water, and a judiciary that protects the interests of

“Voting is crucial. It can determine the strength of our public health and environmental protections, and whether we have leaders who will address climate change.”

— Vickie Patton, EDF General Counsel

the American people over powerful polluters.”

As you head out to the polls, here are some things to keep in mind.

Climate action is delivering results

In the last four years, as a nation, we’ve made more progress than ever in tackling climate change — thanks to the Bipartisan Infrastructure Law and the Inflation Reduction Act, two signature pieces of Biden legislation. But to meet our climate goals, we need to go further, to help those laws fulfill their promise and reduce even more climate pollution.

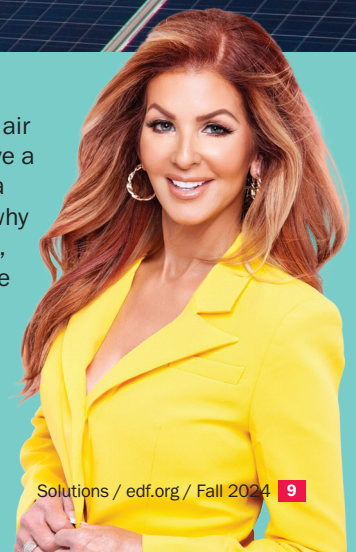
“ Making sure you vote up and down the ticket can lead us forward in creating a world we can be proud of — it may be our last chance.

Hazel Chandler, Arizona



“ My daughter has multiple sclerosis, and air pollution can trigger episodes. I also have a son who has had asthma since he was a little boy. My kids are my why. They are why I really dove into environmental activism, and why I’m personally compelled to vote this November.

Jayne Black, Wisconsin



Thanks to federal investments, renewable energy is now being deployed as never before, with sources like solar and wind power making up 21% of all electricity produced in 2023. Electric vehicles are now cheaper to own and operate than gasoline-powered cars in nearly every state, according to automotive analytics firm J.D. Power. Sales of energy-efficient, money-saving heat pumps, which heat and cool homes, now outstrip gas furnaces, saving consumers money as they prevent pollution.

All these advances come with impressive job growth. The U.S. Department of Labor projects that over the next eight years the fastest-growing occupation in the country will be wind power technician. More than 200,000 jobs building electric vehicles have been announced since the infrastructure law was signed in November 2021.

“It can’t be overstated what extraordinary steps this administration has taken on climate and the progress that’s been made,” says Joanna Slaney, EDF’s associate vice president for political affairs. “And we still have work to do.”

Courts can impact policy

The president nominates new Supreme Court justices and the Senate approves or

rejects them. The impacts of these justices can be profound. In its last two sessions, for instance, the Supreme Court overturned important clean air and wetlands protections. And it threw into doubt the long-standing ability of federal agencies, such as the Environmental Protection Agency, to use their technical and scientific expertise to administer laws.

Judges now have extraordinary power over policy decisions. So when you enter the voting booth, remember: Your vote will impact who sits on the bench.

Every race on the ballot matters

Senators, U.S representatives, governors, and state and local elected officials have pivotal roles to play in making positive change for the environment and our health.

Last year, for instance, Michigan passed legislation that will, by 2040, essentially eliminate air and climate pollution from power plants in the state. *(For more on how states are solving environmental problems with EDF’s help, see p. 7.)*

City officials in arid Mesa, Arizona created incentives to aid homeowners in converting their thirsty, grass lawns to drought-resistant yards, helping to preserve the city’s water supply.



Any Supreme Court vacancies will be filled by the next president.

If there’s a change you’d like to see in your community, state or the country as a whole, find out where your candidates stand, tell them you want them to support policies that protect the environment, and be sure to vote your values.

Preparing for extreme weather

The extreme weather unleashed by climate change is becoming increasingly dangerous. We not only need to improve disaster recovery, we need to invest in solutions that will protect our health, homes and livelihoods in the long run.

Already, the Biden administration has made great strides, investing billions in drought prevention for parched western states and flood protection for storm-prone coastal communities. But it’s only a start — there’s more money yet to be distributed by the federal government, and state and local officials haven’t yet determined how to use some of it.

“Your vote truly has the ability to change the trajectory of our country, of the world, of the environment,” Jhawar says.

He invites you to think of Mira and her generation this November and vote. ■



If you haven’t registered yet, visit edf.org/vote.

GETTY

“Our vote is the best weapon we have against forces in our nation that want to put their heads in the sand and pretend that climate change isn’t real, willfully condemning our children to a bleak future.

Kevin Fisher, Michigan

“Even though I don’t have children, I want everybody’s kids and grandkids to have clean air to breathe and clean water to drink, and a chance to experience the awesome power of the outdoors. We have a beautiful planet, but we must fight to defend it.

Jenny Llakmani, Illinois

Innovation blooms

African farmers turn climate challenges into opportunities.

IN THE FIVE YEARS SINCE HE ACQUIRED his farm in Zimbabwe's Mazowe Valley, Joshua Zinzombe has endured rising temperatures and dry spells that have become longer and more severe. Last December, Zinzombe's parents called to postpone the family's annual Christmas gathering. "They told my sisters and me not to come to their farm because there was no fresh food to eat."

Despite all this, Zinzombe, a father of two, insists that his future as a farmer has never been brighter. "With each new challenge," he says, "we're forced to farm more innovatively. Climate change has improved our creative thinking and made us stronger and more adaptive."

Zinzombe, 39, is emblematic of a generation of resourceful African farmers who are embracing climate-smart techniques. Africa has 65% of the world's farmable land, and still struggles to feed its 1.4 billion people. Yet, with its abundant human and natural resources, the continent is uniquely positioned to lead a global movement toward a more resilient and sustainable food system.

As national youth executive secretary of the Zimbabwe Farmers Union, Zinzombe has been spreading the word about climate-smart farming throughout southern Africa. Closer to home, he demonstrates his climate-smart farming techniques at community workshops he hosts on his farm.

On his 62 arable acres, Zinzombe has developed an integrated farming system



COURTESY OF JOSHUA ZINZOMBE

Joshua Zinzombe helps other farmers adapt to the changing climate.

that combines livestock and poultry with diverse crops that benefit each other. He mulches with manure and "vermicompost" produced from earthworms and insects — saving money on expensive synthetic fertilizers. Between rows of crops, Zinzombe plants legumes and grasses to feed the animals.

These approaches, plus no-till techniques — growing crops without agitating the soil — have dramatically improved moisture retention and soil nutrition.

The water savings are especially important. As drought and population growth strain surface water supplies, Zimbabweans increasingly depend on borewells. Many of the country's aquifers are being drawn down faster than they can be replenished.

"We also provide drinking water for 40 nearby families who can't afford the \$2,000 it takes to drill a well," he says. "So that has made me reduce my irrigation ambitions. The water we pump and collect from our rooftop collectors needs to go a very long way."

Elevating farmers' voices

"African farmers are a critical group at the intersection of climate and food," says

Jennifer Chow, who directs EDF's climate-resilient food systems work. "When their voices are present in national and international conversations, they can help set the stage for transformations that can lift communities out of poverty and build resilience to coming climate shocks."

EDF has funded young farmers' travel and participation in events such as the World Food Prize Borlaug Dialogues and the COP28 world climate summit in Dubai, where leaders for the first time pledged to tackle food and agriculture's role in climate change. EDF is also partnering with the Southern Africa Confederation of Agricultural Unions to support the Young Leaders Incubation Program, which is working to advance climate-resilient farming practices in the region.

"I'm always looking for new techniques to experiment with," says Zinzombe. "But of course, many of them are environmentally friendly techniques that our forefathers did. We mix these in with new technology like drip irrigation systems."

"My neighbors were skeptical at first that they could reduce fertilizer and increase their yields at the same time," he says. "But now the people around me are copying me. They're getting good results, and filling their pockets."

Tom Clynes



Crop diversity helps Zimbabweans meet the climate crisis.

GETTY



Rising waters and stronger storms are forcing many Guna Indigenous families to leave Panama's Gardi Sugdub island.

ALAMY

Rising seas, rising voices

Island nations, on the front lines of the climate crisis, lead the fight for resilience and justice.

IN NOVEMBER OF 2021, THE FOREIGN minister of Tuvalu stood knee-deep in seawater and recorded a video message to delegates attending the United Nations COP26 climate summit in Glasgow.

“We will not stand idly by as the water rises around us,” said Simon Kofe of his low-lying Pacific island nation. “We are mobilizing collective action at home, in our region and on the international stage, to secure our future.” The intention, said Kofe, was to demonstrate the reality of a rising sea for the island nations on the front lines of the climate crisis.

In May of this year, Kofe and hundreds of other island-state representatives converged on the Caribbean island of Antigua for the U.N. Conference on Small Island Developing States. Although the sea continues to rise in most of the delegates’ home countries, the mood was upbeat. Their message: There’s still time to act to head off global catastrophe, and the people who inhabit the world’s islands are leading the way.

“I’m very optimistic,” says Kate Brown, a Maori New Zealander who directs the Global Island Partnership, which seeks to

enable islanders to build sustainable communities. Rather than resigning ourselves to being wiped out ... we are demonstrating the power of coming together to build resilience.”

“ Rather than resigning ourselves to being wiped out, we are coming together to build resilience. ”

— Kate Brown, Global Island Partnership

Island nations and territories have been among the first and most consistent voices championing climate action, having experienced the destructive effects of global warming — rising seas, stronger storms, more intense heat waves — well before landlocked regions. In the Atlantic, for example, the proportion of storms that become major hurricanes (Category 3 or above) has doubled since 1980. These storms are regularly devastating electric grids, disrupting food supplies and damaging crops.

“In countries where there is low income and high debt, a major hurricane can wipe out 200% of their gross domestic product in a single day,” says Zach Cohen, a senior analyst with EDF’s Global Climate Cooperation team. “These countries have contributed virtually nothing to the warming that is making these storms more powerful. How we respond is a question of climate justice.”

At the U.N.’s next climate conference, COP29 in Azerbaijan this November, the Alliance of Small Island States will be calling for an end to fossil fuel expansion and measures that will provide affordable financing to make their communities safer when big storms hit. (See p. 14.)

But many islands aren’t waiting for global consensus.

From blackouts to breakthroughs

The small island community of Culebra is often the first place to be hit by hurricanes ravaging Puerto Rico. In 2017, residents got a one-two punch when Hurricanes Irma and Maria left Culebra’s 1,700 residents without power for months. After a two-year study to evaluate

community-driven approaches to bringing clean energy to Puerto Rico, EDF and local partners teamed up to install solar power to serve low- and moderate- income households. Backed by battery storage and intelligent software, the system can uncouple from the rest of Puerto Rico's grid and keep the lights on during and after storms.

Ten percent of homes in Culebra are now powered by photovoltaic cells. And a \$6 million grant from the U.S. Department of Energy, announced in August, will bring an additional 150 solar energy and storage systems to low-income households on the island — bringing Culebra one step closer to its goal of becoming “the Caribbean's first 100% solar island.”

253%

Percentage of GDP that Dominica lost during Hurricane Maria in 2017.

Source: United Nations Development Program

Since 2000, EDF has been working in Cuba to enable clean energy initiatives, science-based fisheries management and sustainable ocean practices.

“We’re helping people build bottom-up community-based solutions,” says Daniel Whittle, who directs EDF’s Resilient Caribbean program.

A watery problem

Although many island territories are small land masses, they often control vast expanses of ocean. The health of these ocean environments is extremely important to the rest of the world, and neighboring countries in particular.

For example, Cuba’s waters are important spawning grounds for snapper, grouper and other reef fish that are crucial to fisheries in the southeast United States. Cuba and the U.S. also share a deep-water coral reef that covers more than 25,000 square miles and extends as far north as North Carolina. Keeping these shared ecosystems healthy in the face of shifting climate conditions depends on cross-border cooperation and effective environmental decision-making in both countries.

EDF worked with Cuban communities, scientists and officials to expand marine protected areas and create Cuba’s most comprehensive fisheries assessment. Today, diverse champions in Cuba are boosting aquaculture production to support local jobs and food security, and recommending new catch limits to end overfishing.

“These kinds of very practical projects are essential to help island communities build the capacity to develop more resilience as the ocean changes,” says Yociel Marrero, from Cuba’s Antonio Núñez Jiménez Foundation for Nature and Humanity. “But finance is the big issue,” he says. “To do the things we need to do to adapt, we need to find new ways to unlock the substantial capital that’s out there.”

A primary focus of COP29 in Azerbaijan is climate funding. Unfortunately, past conferences have ended with little consensus on the issue.

That’s left many small island countries



Tuvalu's Simon Kofe: “We are sinking.”

in a constant cycle of trying to rebuild with small economies that can’t grow their way out of debt, Brown says.

Financing the fight

Island countries are increasingly turning to public-private partnerships and regional collaborations. Barbados is setting up a bank to finance green projects locally. Dominica is advancing an ambitious array of projects to protect island ecosystems and infrastructure as part of its aim to be the first “climate-proof” nation. And 14 Caribbean countries have created a \$150 million Caribbean Biodiversity Fund to enable reliable, long-term funding for conservation and sustainable development.

As the world races to head off the worst effects of climate change, the window for action is rapidly closing. Increased funding, growing awareness, and supportive policies that strengthen resilience are a cause for optimism. But advocates for small island states remain focused on the path ahead.

“Islands have to reconcile with being the first to hit the limits of what they can adapt to,” says Brown, “but we won’t be the last. Our voices need to be listened to.”

Tom Clynes



Residents of Culebra, Puerto Rico, are vying to become “the first solar island” in the hemisphere.

ANGEL LUIS GARCIA

Prevention is cheaper than the cure

At COP29, EDF experts will advocate for urgent funding to fight climate change.

WITHOUT ACTION TO SLOW GLOBAL warming, climate change is projected to cause \$38 trillion in economic damages a year by mid-century.

But it doesn't have to be this way. "Prevention is cheaper than the cure," says EDF's Juan Pablo Hoffmaister, an expert in climate finance who helped negotiate the Paris Agreement, the world's most comprehensive agreement to combat climate change. Total global climate finance needs are estimated to be far less than the predicted economic damage — about \$10 trillion annually.

But leaders need to act now and fund efforts to slash pollution, ramp up renewable energy projects and advance other climate-saving measures.

So far, they haven't done enough.

According to United Nations experts, world leaders need to mobilize at least \$2.4 trillion annually just to help the most vulnerable nations adapt to a warming world.

That's why this fall's COP29 is of critical importance.

On November 11, world leaders will gather in Azerbaijan for the start of the U.N.'s annual climate conference, where discussions will focus on establishing how much money is needed to fight climate change and where that money will come from.

EDF experts will be there, engaging in negotiations, advocating an ambitious

finance goal and participating in technical expert dialogues.

"Money enables action," says Hoffmaister.

"And we need to act now if we are going to stop the worst effects of climate change."

Here are the key issues:

Where will the money come from?

That's the trillion-dollar question.

Some will come from governments. For example, public funding is needed for infrastructure projects like seawalls to protect coastal areas from flooding. But private finance will also play a role, such as corporate investments in renewable energy and energy efficiency, private equity funds focused on clean technology, and alternative sources like carbon markets and emissions trading programs.

Additionally, a new U.N. "loss and damage" fund provides direct, global financial support to countries and communities struggling with the effects of climate change.

"Every country has competing priorities that put a strain on resources," Hoffmaister says. "But we have to remind ourselves that the impacts of climate change are not limited to national borders. Increasing resilience in other countries helps all of us."

“Money enables action. And we need to act now.”

— EDF's Juan Pablo Hoffmaister



What is holding up funding?

Getting countries to agree on ways to make resources available remains a problem. Some leaders want money to flow directly from the wealthy, high-polluting countries most responsible for climate change to poorer countries. Others advocate for new sources, like private capital.

"Also, some leaders want to keep the target amount that the world needs to a formal figure earmarked to help nations most affected by climate change," says Hoffmaister. "Others consider 'climate finance' to be all the different financial flows that could help contribute to a lower-emission planet. Right now, there's no globally recognized definition, which is why estimates of how much money is needed vary widely."

What's at stake?

If we don't invest in fighting climate change now, we will leave future generations without a habitable climate, says Hoffmaister. That's a cost far greater than any dollar amount.

Vanessa Glavinskis



Climate finance will be at the top of the agenda at November's U.N. conference in Azerbaijan.

REUTERS/AMR ALFIKY

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



Through your lens

TIME SPENT IN NATURE IS WHAT MOTIVATES MANY OF US TO PROTECT our planet. So, we invited you to share photos of the natural world that inspire you. The response was phenomenal. We received nearly 500 photos, and we're excited to showcase a selection of our favorites in this issue of *Solutions*. (You can check out more in our digital publication, *Vital Signs*, using the QR code on the right.)

In the face of climate change, we hope these photos motivate you to continue fighting for our magnificent yet fragile home — today and every day.



SCAN the QR code to see more members' photos on vitalsigns.edf.org.



WILDLIFE: Hummingbird in flight

"I took this photo in our yard in Memphis, Tennessee. Our yard is a certified wildlife habitat, and we have something native in bloom from spring until the first frost. Bird populations in North America have gone down by 3 billion over the past 50 years primarily due to loss of habitat, so I am a strong supporter of 'rewilding' by replacing grass lawns with native plants." — **David Sloas, TN**



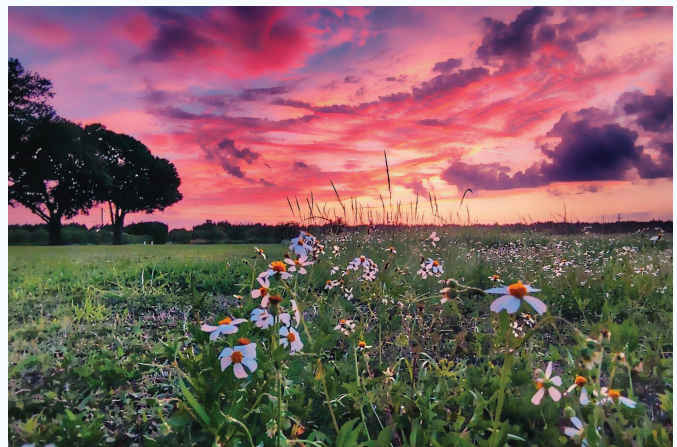
ENJOYING THE OUTDOORS: Peek-a-boo!

"This photo of a raccoon at home in an old tree was taken on a hike that my wife and I were leading at a nature center near Colorado Springs. It's a place many children visit and experience nature and people coexisting. If the raccoon is asleep, often only an ear or a foot is visible. This time the raccoon was awake and looking back at me." — **Robert Jones, CO**



PORTRAITS OF PLANTS: Bleeding hearts

"I took this photo in our backyard in Valatie, New York. It's a perennial known as a bleeding heart because of the heart-shaped flowers and teardrop-like bulb. It was a present for my wife a couple of years ago, and I took the photo because I like the shape of the blooms and the warmth of their red color." — **Steve Callahan, NY**



UNFORGETTABLE LANDSCAPES: Wildflowers at sunset

"This photo was taken in St. Lucie County in Florida last May. I was trying to capture the beauty of the simple wildflowers against the dramatic sunset. As a citrus farmer, I have seen the changes happening to our environment firsthand. Protecting what we have for future generations is what drives me to care deeply about our planet." — **Susie Cassens, FL**

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