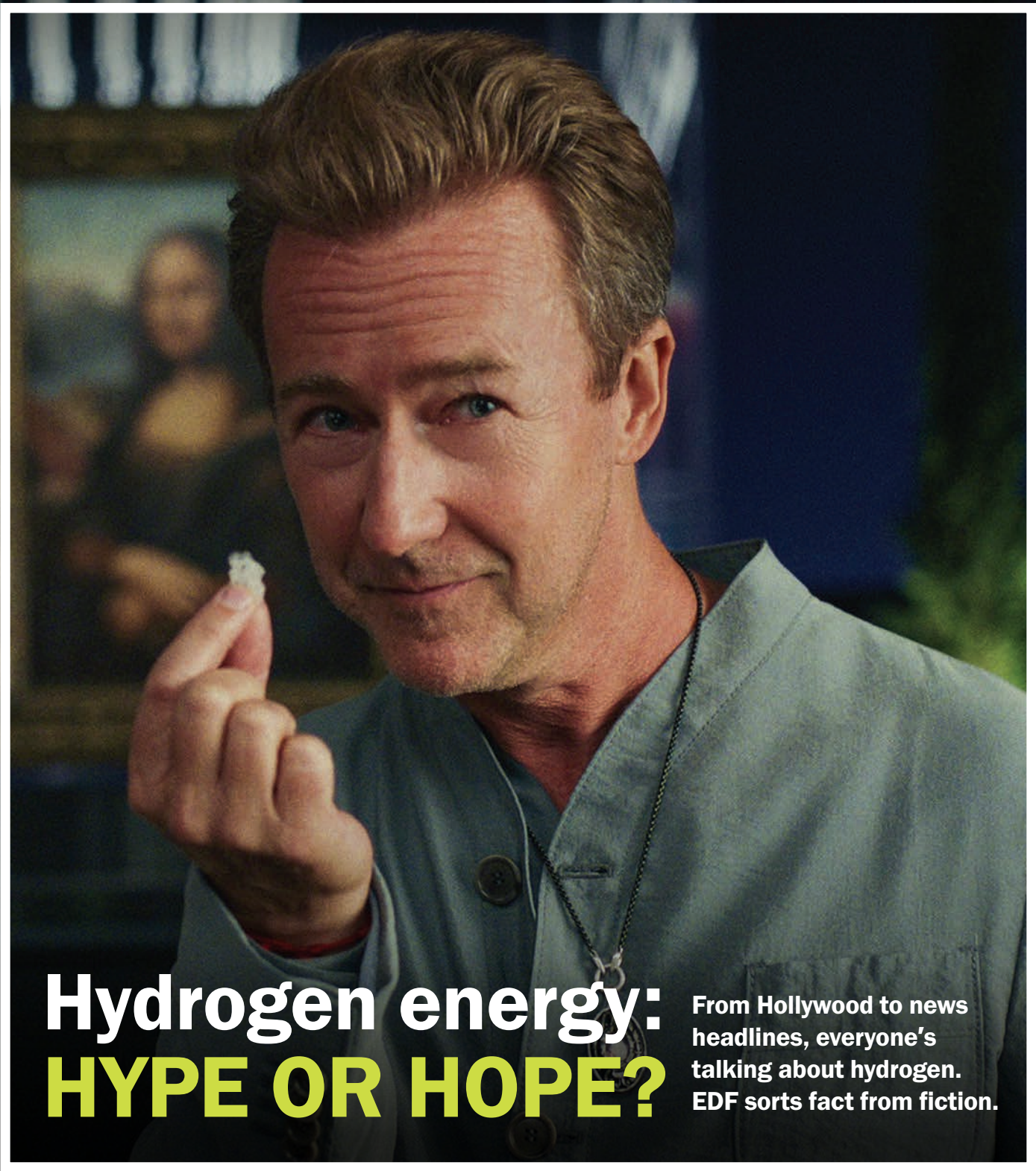


# SOLUTIONS



Vol. 54, No. 2 / Spring 2023



## Hydrogen energy: **HYPE OR HOPE?**

From Hollywood to news headlines, everyone's talking about hydrogen. EDF sorts fact from fiction.

ALSO INSIDE: Dairy giant's methane mission | EDF to EPA: Slash soot | Green spring clean

# Bringing wetlands back

Louisiana has lost more than 2,000 square miles of land since the 1930s and continues to lose the equivalent of a football field every 100 minutes to rising sea levels and erosion. Now, after decades of work by EDF and partners, the state has a green light to break ground this year on a \$2.3 billion sediment diversion project that will stem the tide of loss.

One of the largest ecosystem restoration projects in the world, it will use the power of the Mississippi River to move freshwater and sediment into degraded wetlands, mimicking the natural processes that built south Louisiana over millennia. This and other efforts to restore Louisiana's coast will create and support thousands of jobs, provide storm protection to communities and help ensure the long-term sustainability of this valuable ecosystem.



# Collaboration creates change



EDF has been working with Danone, one of the world's largest dairy companies, to reduce planet-warming methane emissions, mostly burps, from dairy cattle.

If it seems silly to help cows burp less, consider this: Livestock accounts for about a third of global methane emissions from human-related activities — and total methane emissions this year will have a bigger warming effect on the planet over the next 10 years than all of this year's carbon dioxide from burning fossil fuels.

Of course, we also need to simultaneously drive down carbon dioxide emissions because those can keep heating the planet for centuries.

Danone recently pledged to reduce agricultural methane emissions from its fresh milk supply by 30% by 2030 (*see p.15*).

This is huge. It's the first methane-specific climate commitment by a major food company. EDF will work to help Danone meet its pledge by providing scientific research, economic solutions and accountability. And we will work with other dairies and farms that also want to be a part of the solution.

We are sometimes asked why we work with businesses. It's simple: They are the ones that emit the most greenhouse gases that we urgently need to cut to stabilize global temperatures.

That's why, more than a decade ago, EDF started talking to oil and gas companies about their methane emissions. And we were pleased when most of the companies we asked allowed us onto their properties to measure methane emissions. That's how our scientists found that methane pollution from flaring and leaks was far higher than the companies — and the EPA — had estimated.

We then began working with the companies to reduce their methane pollution and set up systematic monitoring, measurement, reporting and verification systems.

We will soon be able to verify both emissions and reductions with the satellite data from MethaneSAT, an EDF affiliate.

None of this would have been possible if EDF's staff didn't take the time to understand the culture of the organizations we work with in order to come up with solutions that would be adopted (*see p.6*).

As the world begins to ramp up production of hydrogen energy, we are working with companies and applying that same principled collaboration and scientific rigor to ensure hydrogen's potential climate impacts are learned before a new energy system is built out (*see cover story, p.8*).

I'm proud of our willingness to find the ways that work, even when it's hard. After all, we don't do this work because it's easy. We do it because it's necessary to build a vital Earth for everyone.

*Fred Krupp*  
EDF President

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*On the cover: Ed Norton plays a billionaire with big hydrogen dreams in the movie Glass Onion.*

*Photo: Netflix*

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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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## Solar bolsters Puerto Rico

U.S. Secretary of Energy Jennifer Granholm recently visited Culebra, Puerto Rico, to see a promising clean energy project developed by local residents in collaboration with EDF and Fundación Colibrí. Today, 45 homes in the island municipality have rooftop solar panels and battery storage systems to provide electricity when the power goes out. “We are determined. The Puerto Rican people are determined. And we are grateful to be in partnership with EDF and others to make this happen,” Granholm said in March.

Puerto Rico’s electric system is notoriously fragile. After Hurricane Irma and Hurricane Maria hit back-to-back in 2017, Culebra’s 1,800 residents waited 18 months for full electric service to be restored.

But when Hurricane Fiona sparked another massive blackout in 2022, Culebra residents with newly installed systems were able to ride out the storm. “Almost immediately my solar system started working and energized the whole house,” said resident Roberto Rexach.

Efforts to modernize Puerto Rico’s grid are gathering steam. Congress appropriated \$1 billion in December 2022 to help Puerto Rico make grid improvements and the U.S. Department of Energy has created a new team to help advance this work. A recent DOE report confirms that expanding rooftop solar and storage will help Puerto Rico’s electric grid recover faster from disaster. Community-led clean energy projects like this one serve as a model for clean, reliable, affordable energy for Puerto Rico.



## Quacking down on pests, naturally

Pest control and fertilizer come in one cute package at Vergenoegd Löw The Wine Estate, a vineyard and historical site near Cape Town, South Africa. Rather than using toxic chemicals, Vergenoegd employs a web-footed battalion of domesticated Indian runner ducks to gobble up snails and bugs while leaving a trail of natural fertilizer in its wake.



## Ozone layer on the mend

The ozone layer, which protects people from the sun’s harmful rays, is on a path to recovery within four decades, according to a UN report. “In line with predictions, we’re starting to see real-world benefits from the Montreal Protocol,” says climate scientist Yangyang Xu. “Our success

in phasing out ozone-depleting chemicals shows us what we can achieve with a global effort.” The Montreal Protocol, the 1987 treaty designed to protect the ozone layer, and its amendments are also benefiting the climate, helping to avoid an estimated 0.5°C of future warming.



## THIS MIGHT STING A BIT

The U.S. Department of Agriculture has approved a first-of-its-kind vaccine to protect honeybees against American foulbrood, a disease that can wipe out whole colonies. The vaccine is doled out through food given to the queen bee who then transfers immunity on to her larvae.



GETTY IMAGES

**MEET EDF**

## Sam Parry

Associate Vice President, Membership

### What do you do?

Readers of *Solutions* might think I spend my days sending them lots of emails. (Please open them!) But really, I oversee our online fundraising and outreach to members.

### You joined EDF 20 years ago. What keeps you here?

On my very first day, I remember thinking, “This is a different kind of organization.” I was just so impressed with our experts. Everyone was a leader in their field. It’s also the spirit of the folks here. People have a mission to advance solutions that will hopefully steer us to a safer future.

### You’re one of EDF’s most public faces. Do you ever get recognized?

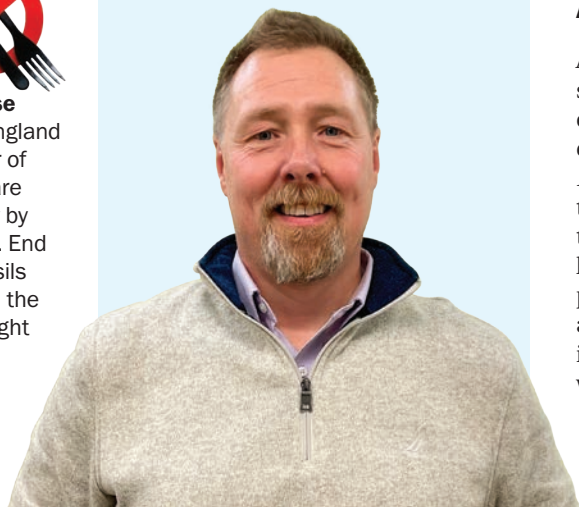
It’s happened a handful of times over the years. I’ll run into someone in a restaurant. But my pandemic beard makes me almost unrecognizable now.

### Who is your hero?

My father, a fearless journalist who took on conventional wisdom.

### Tell us a fun fact about you.

I’ve been bike commuting to EDF’s Washington, D.C. office for 12 years. In that time, I’ve clocked at least 50,000 miles.



**In 2022, one in 10** new cars sold worldwide were fully electric vehicles, with sales especially strong in China and Europe.

Source: LMC Automotive, EV-Volumes.com



**A ban on single-use** plastic cutlery in England will cut the number of pieces of plasticware Britons throw away by 2.7 billion annually. End to end, these utensils would wrap around the world more than eight and a half times.

Source: Gov.UK



## VIDEO ▶ Why is Bill Nye’s bow tie on fire?

Everybody’s favorite TV scientist is starring in a new EDF video about methane pollution — and why stopping it is the fastest way to slow global warming. “When I’m in a bad situation, I want the fastest solution possible,” says Nye, who shared why he was enthusiastic about cutting methane: “I used to work in an oil field. Methane leaks out of everything.”



View the video by scanning this QR code or visit [edf.org/nye-methane](https://edf.org/nye-methane).



Author and EDF VP Heather McTeer Toney.

BRANDON SULLIVAN PHOTOGRAPHY

## A fresh look at climate justice and action

As a child, Heather McTeer Toney had to arrive home before the streetlights came on or face her parents’ ire. “We had to hustle or we’d be in big trouble,” says Toney, EDF’s VP of community engagement. In her new book, *Before the Streetlights Come On: Black America’s Urgent Call for Climate Solutions*, Toney covers the impacts Black Americans face because of society’s failure to move quickly on global warming — such as being twice as likely to be hospitalized or die from climate-related health problems than white counterparts. But Black communities are also among the best suited to lead on climate, says Toney. “This issue affects every aspect of life for Black America. We need the world, including the Black community, to respond accordingly.”

# Quitting for a cause

Meet the EDF staff who left the oil and gas industry to take on climate change.

By **Vanessa Glavinskas**

**A** RECENT *BLOOMBERG* ARTICLE calls them the “climate quitters.” The *Financial Times* dubbed them the “green defectors.”

Who are these newsmakers? They’re part of a growing group of people who quit their jobs in order to pursue a planet-saving career.

But some climate quitters don’t completely leave their past behind and, at EDF, that can be a good thing. Andrew Baxter and Shareen Yawanarajah are two of several EDF employees who left careers in the oil and gas industry and now leverage that experience to help clean it up.

## “I followed in my dad’s footsteps.”

Baxter grew up in awe of his father, a field engineer who drilled oil wells across North Africa and the Middle East. He remembers flipping through photographs of his dad standing in the middle of the desert, wearing aviators and a fire-retardant suit, with flames shooting up behind him. “He looked like Action Man,” says Baxter, a director on EDF’s energy transition team, revealing his Scottish roots by referencing the popular U.K. action figure.

That kind of career looked exciting, and Baxter and his brother both went into the industry to follow in their dad’s footsteps.

For years, Baxter operated drilling equipment for Shell in nearly every oil-rich part of the world — from the deserts of Jordan to the waters of the North Sea.

“I’d fly to work in a helicopter and stay on the rig for three weeks, sharing bunks with people more than twice my age,” he says of his time in the North Sea. “It’s a tough life with long hours and no days off, but there is an immense amount of camaraderie.”

One morning, he leaned over the side of the rig and noticed an oil slick that stretched to the horizon. Something was leaking.

“I remember thinking, ‘This is just wrong,’” he says.

## Changing course

In 2018, unable to reconcile the industry’s harms with his own values, Baxter left Shell. But he didn’t completely leave oil and gas behind.

After completing an MBA program, he joined EDF’s energy transition team. He now helps oil and gas companies reduce methane emissions. It’s critical work because cutting methane is the fastest way to slow global warming.

Methane has more than 80 times the warming power of carbon dioxide during the first 20 years it’s in the atmosphere, and EDF research revealed that the oil and gas industry is a far greater source of this pollution than previously believed. Because most oil and gas methane leaks, once found, are easy to fix, cutting methane pollution from this industry is a fast and cost-effective climate solution.

“We’re trying to get the industry to set extremely strict targets around methane emissions and report their progress

using methods EDF scientists have helped design,” says Baxter. “Every conversation is a negotiation, thinking about how oil and gas organizations make decisions, and what would move them to yes.”

Even better, he now feels good about his work. “The psychic benefit of working for an organization where I’m excited and motivated, even though the work is difficult, is worth a lot,” he says.

## “Why are we doing this?”

Dr. Shareen Yawanarajah reached her breaking point when the oil company she worked for restarted drilling in the Arctic.

“I remember thinking, ‘With everything we know now about climate change, why are we doing this?’” she says.

At first, she tried to change things from within. “Internal environmental discussions — mostly about carbon dioxide emissions — would often become heated,” she recalls. “Environmental concerns were viewed as an annoyance because they were not a part of the core business of making money by extracting oil and gas.”

Eventually, Yawanarajah left the industry. She spent several years in government service, including in the U.K., where she saw oil and gas rig workers in the North Sea transitioning to offshore wind operations. Seeing how easily welders could transfer their skills from an oil rig to a wind farm helped her see that a transition to clean energy was not just a hopeful theory — it could actually work for people on the ground.



Like his father (left, in Saudi Arabia), Andrew Baxter (center and right) was a field engineer in the oil industry. He joined EDF in 2020.



Shareen Yawanarajah worked on geochemical field sampling in Venezuela for BP in the 1990s (left). Today, she helps lead EDF's global energy transition team.

In 2018, Yawanarajah joined EDF. As director of the global energy transition team, she now advocates for government and corporate action to measure and reduce methane emissions from the global oil and gas industry. Her understanding of how the industry works not only gives her credibility, it also means she's not afraid to challenge oil and gas executives on their claims. "If someone says that reducing methane pollution is too expensive, I counter that methane reduction is a part of operational excellence, which companies should strive for anyway," she says.

At the same time, says Yawanarajah, finding support within the industry for reducing methane leaks isn't as impossible as it may seem. "People forget that you have millions of highly educated individuals working on complex scientific problems within the oil and gas industry," she says, which can translate into a culture eager to solve problems like methane leaks.

"The complexity of the industry is what drew me to it," she adds. "Now it drives me to be a part of the solution."

### A growing trend

As a sense of urgency about the climate crisis grows, there's also a wider group of workers beyond those in oil and gas who are seeking to use their skills to combat climate change.

Tom Melendez is one of them. A former software engineer at Google, he now works for EDF-affiliate MethaneSAT, which will launch a satellite capable of measuring methane emissions from space — a powerful new tool to hold oil and gas companies accountable for their emissions. A dad of two, Melendez says

he left Google because "pushing bytes around" for the company wasn't going to improve the world for his kids.

He's not alone in that sentiment. Almost a million people have used the job board Climatebase since it launched three years ago to explore job opportunities at climate tech companies and nonprofits. And, according to the job-networking site LinkedIn, sustainability jobs are among the fastest-growing careers globally.

Daniel Hill, a manager on EDF's innovation team, experienced this trend first-hand when, in the wake of the tech layoffs in late 2022, he introduced the hashtag #OpenDoorClimate on LinkedIn to signal his willingness to chat with former tech workers considering a career fighting climate change.

The response was overwhelming. In the space of three months, Hill says that he and other climate professionals have spoken to roughly 2,500 climate job seekers.

"I believe that everyone who wants to work to solve the climate crisis should be able to easily access a network of industry professionals ready to chat," says Hill. "It seems simple, but sometimes a 15-minute chat is all someone needs to get inspired and see a path forward." ■



### GET INSPIRED

#### Thinking about "climate quitting?"

Listen to EDF's Degrees podcast at [edf.org/degrees-green-jobs-podcast](https://edf.org/degrees-green-jobs-podcast)

Find a mentor at [opendoorclimate.com](https://opendoorclimate.com)

Search opportunities at [climatebase.org](https://climatebase.org)

Network at [workonclimate.org](https://workonclimate.org)

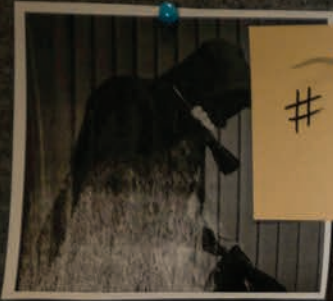
## Is your climate support keeping pace with the economic climate?

If you're like us, rising interest rates and inflation have caught your eye along with rising temperatures. Fortunately, there are financial strategies well suited to provide income and security during these uncertain times — while also furthering your support for the planet.

Contact us today to request our helpful guide, **5 Current Economic Concerns and 10 Strategies to Take Advantage of Them.**

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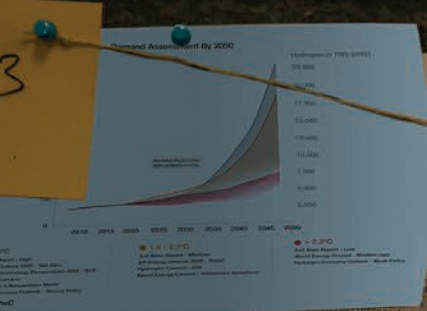
**GOLDMAN PREDICTS CLEAN HYDROGEN WILL BE A \$1 TRILLION MARKET. HERE'S HOW TO PLAY IT.**



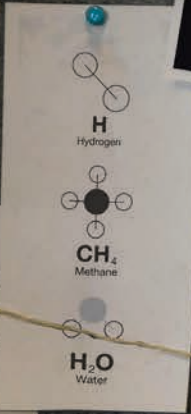
Where?



Why?



**HYDROGEN: A GEOLOGICALLY ABUNDANT, BUT CHALLENGING, PRIMARY ENERGY SOURCE FOR A LOW-CARBON FUTURE**



**Italian researchers have built the first hydrogen-powered house in Europe**



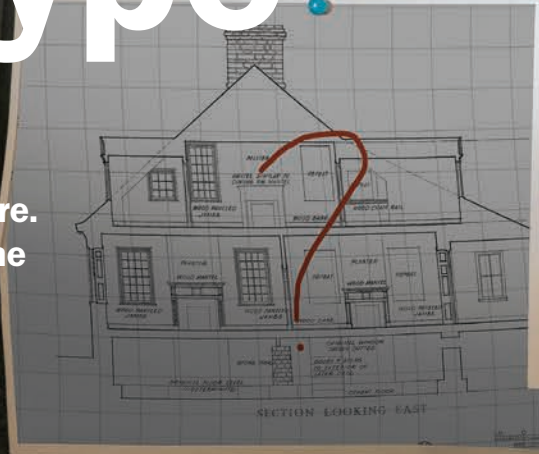
# Behind the hydrogen hype

By Shanti Menon

**Largest plane yet tested with hydrogen-powered engine**

It's turning up in movies and headlines as the fuel of the future. But not everyone knows that hydrogen could pose a risk to the climate. EDF has the inside scoop.

Who?





# The hydrogen revolution in the skies

CASPAR HENDERSON | 8th April 2022

As the plane rose from the runway for what was to prove a smooth and uneventful flight, the team breathed a sigh of relief. The six-seater Piper M-Class had been fitted out at a research and development hub at Cranfield airport in the UK to run on hydrogen, and on this maiden flight in the late summer of 2020 everything worked perfectly. With that flight, ZeroAvia, the California-based start-up that had developed the aircraft with partners in Britain and elsewhere, was ready to move to the next stage in the journey towards zero carbon aviation.

The good news is that commercial aviation has an excellent track record for improving efficiency. Carbon dioxide emissions per passenger flight have fallen more than 50% since 1990, thanks to improved engines and operations. The bad news is that gains have been overwhelmed by volumes of air traffic. This has increased by at least a fifth over the past five years, and is predicted to reach 10 billion passengers a year by 2050.

At first glance, hydrogen looks to be a good solution to the challenge of flying without wrecking the climate. When hydrogen is used to power a fuel cell, it generates electricity or directly combusts for motive power, the only waste product is clean water. Importantly in the context of flight, hydrogen packs a lot of energy per mass – three times more than conventional jet fuel, and more than a hundred times that of lithium-ion batteries.

Governments and companies are investing in this potential. ZeroAvia's 2020 hydrogen-powered flight, known as HyFlyer 1, was supported by the UK Government, whose Jet Zero Council

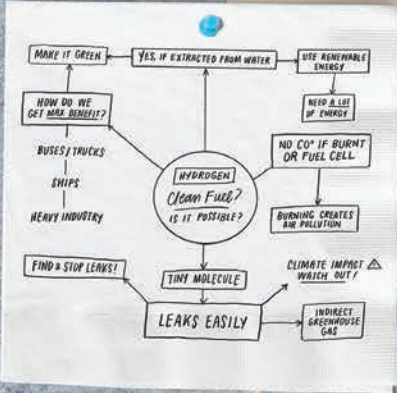
A catchphrase for the transition to a low or zero carbon economy is "electrify everything" – that is, create a world in which most human activities, from manufacturing and construction to transport and tourism, run on electricity generated from low or zero carbon sources such as wind, solar and perhaps nuclear power. But there is a problem: some sectors look to be hard if not impossible to electrify in the near and medium term, and aviation is, perhaps, foremost among them.

Before the pandemic aviation accounted for about 2.5% of global emissions of



Green?

#2



Billionaire entrepreneur Miles Bron holds a tiny crystal in his hand, a manic gleam in his eye. "That's a new solid hydrogen fuel," he says, in the movie *Glass Onion: A Knives Out Mystery*. "It's incredibly powerful. It's radically efficient. Zero carbon emissions... It's going to be powering people's dreams all over this country by the end of this year."

**Is Bron a genius, or a fraud?** Is hydrogen really the zero-carbon fuel of our dreams? And is one of Bron's so-called friends going to murder him in the luxurious, hydrogen-powered Greek villa where they've all gathered under mysterious circumstances?

If you've seen the movie, you know the answer to that last question. What you may not know is the real story of hydrogen energy — a story that is playing out right now, in real life, and could have serious implications for the climate.

Hydrogen's promise as a climate solution has piqued the interest not just of Hollywood screenwriters but of entrepreneurs, scientists and governments — including China, India, the EU and the U.S. Headlines tout "hydrogen-powered supercars" and a "\$1 trillion market" for clean hydrogen. According to

McKinsey & Company, more than 680 new large-scale hydrogen projects have been announced around the world, representing \$240 billion in investment over the next decade.

As the hydrogen hype machine revved up, EDF scientists launched an investigation into hydrogen's potential climate impacts. Thanks to this research, investors are learning that hydrogen isn't the golden ticket to a stable climate. In fact, it comes with a set of considerable challenges: for one, hydrogen leaks could harm the climate. ▶

PHOTO COMPOSITE BY TINK TANK STUDIO

...the fuel cell equity away has had false starts before, but we see the appetite from investors policy as well as announced hydrogen plants as a genuine attractive opportunity," the analyst Lavoie said, highlighting policies such as the U.S. Inflation Reduction Act.

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## Hydrogen Generation \$1 Trillion Per Year M

What is Holding the Hydrogen Boom Back?  
But for all the buzz surrounding the hydrogen economy, the sector has badly underperformed the market this year. Hydrogen and fuel cell stocks have been crushed, losing about 70% YTD, compared to 25% for the S&P 500. Even the leaders of the space have not fared much better. Plug Power stock, last returned 31.2% YTD while that of pure-play Ballard Energy, Inc. (BLDP) have lost 45% over the timeframe.  
Has it not been all doom and gloom, though? In August, Plug Power signed a deal to supply liquid green hydrogen to Amazon (AMZN), beginning 2023 to help decarbonize the company's operations.  
As part of the deal, Plug will grant Amazon a warrant to acquire up to 10M common shares at an exercise price for the first 9M shares of \$22.96/share, and for the rest a price equal to Plug's 30-day volume-weighted average price when the first 9M shares are issued. Amazon would fund the warrant in full if it spends \$1 over the seven-year term of the warrant agreement, including electricity, fuel cell and other green hydrogen.  
Under the deal, Plug Power will supply 100,000 lbs of liquid green hydrogen beginning January 2025, something the company has to see as a "growth opportunity" that is expected to reach \$3.5B in revenue by 2025. On the flip side, Amazon says the contract should provide an annual power of 20K barrels of 100 heavy-duty trucks to long-haul transportation.  
Despite the bright long-term outlook for the hydrogen sector, companies like Plug Power have recently ballooning operating costs in the underlying sector. In Q2 2022, PLDP's operating expenses increased 132% year-over-year to \$1.1 billion, up from \$390 million in Q2 2021. Similarly, Ballard's operating expenses increased 65% YTD to \$1.1 billion, up from \$670 million in Q2 2021. For the full year, PLDP has a 100% increase in operating expenses of 80%, and Ballard has a 148% year-over-year increase.

All manner of industries are piling into the hydrogen rush

The Economist

The story of hydrogen is still unfolding, and EDF is working to unravel a tangled web of questions about how, where and when hydrogen can best be used. In the meantime, let's sort out hydrogen fact from Hollywood fiction.



TOYOTA

The Promise Of Green Hydrogen **Forbes**



GETTY IMAGES

## Q. Is hydrogen energy clean?

**A.** Hydrogen produces zero carbon emissions when it's burned or used in a fuel cell. That's why industry leaders and governments, and not just fictional movie billionaires, have made ambitious claims about hydrogen as a climate-friendly form of energy.

Here's the rub: Pure hydrogen is rarely found in nature. It must be extracted from another source, and today, almost all hydrogen is extracted from coal and natural gas, releasing carbon dioxide as a byproduct. Currently, if hydrogen production were a country, it would rank as the world's fourth-largest source of CO<sub>2</sub> pollution. And that is with only a small amount of hydrogen being produced.

There's promise in green hydrogen,

which can be produced from water using renewable energy. But today, less than 1% of hydrogen is green.

Also, even green hydrogen isn't harmless. If burned, hydrogen creates nitrous oxides. These air pollutants can cause asthma, bronchitis and increase the risk of heart disease, putting the health of people who live and work near hydrogen facilities at risk.

And here comes the plot twist: "Hydrogen is a leak-prone gas with a potent climate-warming effect that is often overlooked," says EDF scientist Ilissa Ocko. "If hydrogen is going to deliver what its backers promise, we need to keep it from escaping into the atmosphere."

## Q. Are hydrogen leaks dangerous?

**A.** Hydrogen gas molecules are tiny and flammable, which makes large hydrogen leaks a safety hazard. But there are systems already in use today that monitor and minimize these risks. The explosive "It's going to blow us all up!" scenario is strictly Hollywood territory.

Here's what most people don't know: the small hydrogen leaks are the ones to watch out for, because they can actually exacerbate global warming. Hydrogen is an indirect greenhouse gas. When it leaks, it creates a chain of chemical

reactions that increases the amount of greenhouse gases in our atmosphere. And until very recently (*see sidebar, opposite page*), there has been no way to find small hydrogen leaks.

As the hunt for climate solutions ramps up, industrial development of hydrogen is picking up steam around the world. That means locating and measuring hydrogen leaks is fast becoming a critical issue. EDF is already on the case.



## TO CATCH A LEAK

## Q. Can hydrogen power the world?

**A.** Hydrogen is currently mostly used in oil refining and in the chemical industry. For energy, it's only used on a very small scale in buses and cars, and in a handful of trains, trucks and homes. A future fully hydrogen-powered world is "unlikely and unnecessary," says Ocko.

In many cases, renewable electricity is far more efficient, affordable and cleaner to use than hydrogen. EDF analysis shows that green electricity could power up to 16 times more homes and as many as 9 times more cars when it's used directly for these purposes, rather than diverting it to make green hydrogen to do the same thing.

If it's not going to power everything, where does hydrogen energy make sense? In heat-intensive industries, like

cement production, or in ships, where electrification is difficult. It also makes sense to manufacture hydrogen close to where it will be used in order to minimize leaks during transportation. A hydrogen system that's as leaky as the current natural gas system could spell trouble for the climate.

Companies and governments are already beginning to develop industrial "hubs" of facilities to develop hydrogen and other clean energy projects. EDF has created model guidelines to ensure these hubs are built with community and climate benefits as priorities. That means including measures to monitor leaks and ensure health protections and economic development for local communities.

**Is Hydrogen the Power Industry's Holy Grail? POWER**

## Q. What's the bottom line on hydrogen?

**A.** Hydrogen can be a key tool to cut climate pollution — but its benefits are far from guaranteed. It's going to take careful planning, more climate research and leak detection rules and technologies to make sure hydrogen can deliver the climate benefits we so urgently need.

The real story of hydrogen is still being written — but by getting in on chapter one, EDF experts are hoping to bring this tale to a safe, climate-positive conclusion.

"We're looking at the first step in a new, 'clean' industrial revolution," says Nichole Saunders, who led the development of EDF's guidelines for better hubs. "We have to raise the bar on these projects now. We're not going to get a second chance to get it right." ■

*Additional reporting  
by Vanessa Glavinskas*

**On a chilly Colorado morning**, a group of scientists drove their research van slowly — very slowly — through a climate crime scene. In the middle of a grassy field, a pipe was releasing tiny amounts of hydrogen, an indirect greenhouse gas. Their job: detect and measure the leak using a novel sensor.

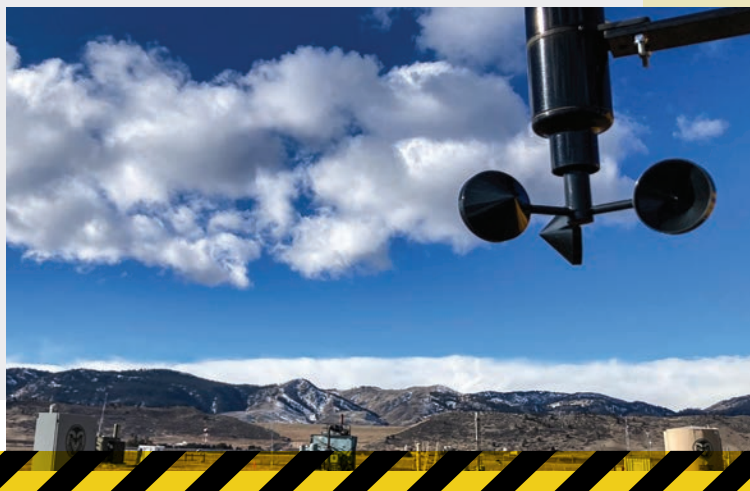
It was no simple task. Hydrogen is odorless and invisible, even to infrared cameras. Existing safety sensors do a good job of alerting people to the presence of a large, potentially explosive hydrogen leak. But it will take a whole new kind of sensor to detect and measure smaller leaks — the kind of leaks that EDF scientists have determined could add up to undermine the climate benefits of deploying hydrogen.

The new sensor did indeed catch the leak, by detecting and counting tiny amounts of hydrogen molecules blowing in the breeze. It was part of a test designed by EDF scientist Tianyi Sun, Aerodyne Research and Cornell University researchers. The "crime scene" was the Methane Emissions Technology Evaluation Center at Colorado State University, a field dotted with oil and gas equipment where "leaks" can be released and remotely controlled to field-test new technologies.

By detecting tens of parts per billion of hydrogen within seconds, the sensor represents a breakthrough in hydrogen emissions detection. "Now that we

know it works, we can take this instrument to real-world facilities like fertilizer plants, or hydrogen fueling stations, and measure how much hydrogen is escaping day to day," says Sun. "Right now, we know very, very little about how much hydrogen leaks. And filling that gap in our understanding is critically important for the climate."

**New hydrogen detection technology passes the test in Colorado.**



# 500 million people to breathe easier

EDF's Sergio Sánchez discusses a groundbreaking international partnership.



DIEGO ASUNSOLO RAMIREZ OF MEXICO CITY HEADSHOTS

**S**ERGIO SÁNCHEZ IS AN UNWAVERING optimist.

It's a quality that will serve him well as he takes on a Herculean task: Leading EDF's ambitious new partnership with the UN Environment Programme (UNEP) that aims to improve air quality across 33 Latin American and Caribbean countries over the next four years.

We caught up with Sánchez, EDF's senior policy director for global clean air, just as he wrapped up a visit to Bogotá, Colombia — the site of EDF and UNEP's first conference — which brought together nearly 200 prominent leaders from Latin America and the Caribbean.

## Q. What makes Latin America's air pollution problems unique?

**A.** Around 80% of people in Latin America live in cities. And because pollution in those cities is high, it means about 500 million people are breathing air that exceeds the World Health Organization's guidelines for pollutants like nitrogen dioxide, soot and ground-level ozone. That exposes them to health problems ranging from asthma to cancer, which lead to hundreds of thousands of premature deaths. It's a major problem, but it's also an opportunity, because just a few changes would help a lot of people breathe cleaner, healthier air.

## Q. What kinds of changes?

**A.** Improving public transportation, as well as setting and enforcing stricter regulations on emissions, are among the fastest routes to reducing air pollution. But to take advantage of this low-hanging fruit, countries and cities need to increase funding and investments.

So EDF has partnered with UNEP to help national and subnational governments access the resources they need, while also amplifying the demand for action. Our two organizations aim to build collaborative clean air solutions across 33 Latin American and Caribbean countries over the next four years.

## Q. That sounds daunting. How are you approaching it?

**A.** We are emphasizing regional cooperation across Latin America. So, we are initially focusing on developing networks to share knowledge and discuss opportunities to collaborate. Our second goal is to help countries and cities develop pilot projects that cut air pollution by, for example, reducing short-lived climate pollutants, like soot, methane and tropospheric ozone, that harm human health and warm our planet. I hope that we can build successful case studies all over Latin America and the Caribbean that serve as an inspiration for other cities, generate more funding and show that transformational change is possible.

## Q. What's happened so far?

**A.** Last October, EDF and UNEP hosted an international workshop in Bogotá, Colombia, which brought together nearly 200 leaders of countries, cities and civil society, as well as development partners from across Latin America and the Caribbean to discuss the current situation. We asked questions like: What have been the most important developments to control air pollution around the world? Can they be replicated? Why are efforts to combat air pollution so underfunded? What can we do to get more resources?

Our goal is to listen to local and national leaders to find out what they need, and why — and assist them to build collaborative, high-impact solutions. Some of the needs that rose to the top included strengthening air quality monitoring systems and helping countries to develop clean air actions to simultaneously achieve health and climate goals. These are the kinds of things EDF's scientists and policy experts can support, while UNEP focuses on organizing regional cooperation across cities and nations.

## Q. What keeps you up at night?

**A.** There are still many gaps in knowledge when it comes to air quality in Latin America. Not all countries are even measuring air pollution. And, of those that are, not all are reporting it right. Without good data we can't even begin to address the problem. You can't manage what you can't measure.

## Q. What's next?

**A.** We are moving forward. This month, EDF, UNEP and the Climate & Clean Air Coalition will co-host a workshop in Panamá City on ways to reduce short-lived climate pollutants. Later this year, EDF will select 10 projects to provide with technical assistance and will mobilize resources to support their implementation. As the selected projects are developed and implemented, I hope they serve as examples of what works and build excitement to spark the mobilization of funding and technical resources to help reduce air pollution all over Latin America and the Caribbean.

Vanessa Glavinskas

# One van at a time

EDF Europe is helping cities reduce pollution from the oft-ignored urban delivery sector.

**T**HE SMALL CITY OF KARDITSA, Greece — known for its archeological museum and free-roaming peacocks — was facing a challenge: Local officials wanted to become climate neutral by 2030. But they needed help decarbonizing the delivery and freight sector that served the city's businesses and 39,000 residents.

Their problem was a common one. Many municipalities across Europe have ambitious climate goals. But few of them, especially the small- and mid-sized cities that are home to approximately 40% of Europe's population, have expertise in cutting carbon and air pollution from truck traffic within cities.

“Urban logistics remains an essentially forgotten element in urban planning.”

— Freight Matters founder Sandra Rothbard

There are no precise figures on exactly how much this sector, which encompasses last-mile deliveries, waste collection and business-to-business deliveries, contributes to Europe's greenhouse gas emissions and air quality problems. But overall, freight is responsible for approximately 20% of European road transport emissions. And a recent report by the European Commission said that intra-city truck traffic, also known as urban logistics, was responsible for “a significant share” of emissions in EU cities.

“Urban logistics remains an essentially forgotten element in urban planning,” says Sandra Rothbard, founder of the consulting group Freight Matters.

EDF Europe, in collaboration with leading transportation nonprofit POLIS, is helping to rectify that through a project called SURF — Sustainable Urban Freight — aimed at tackling intra-city truck traffic across the EU.

To date, SURF has established a series of pilot projects that brought experts to work with officials, businesses and residents in three cities: Aarhus, Denmark; Ravenna, Italy; and Karditsa.

A cornerstone of the projects involves gathering a wide range of local knowledge and perspectives to design solutions that work for local people and businesses. The projects brought together delivery drivers, businesses, residents, government planners and officials to understand the unique challenges each city faces and explore ways to address them.

“Each city is different. So their solutions will be different, too,” says Dagmar Droogsmma, EDF Europe's associate vice president for European strategy & engagement.

In Aarhus, city employees rode along with delivery drivers and interviewed street food vendors to better understand obstacles to zero-carbon logistics. Discovering opportunities to cut pollution from garbage hauling, the city government is now creating a group to review proposed changes to the system.

In Ravenna, the group brought together a team of local stakeholders to look at creating a zero-emissions zone. The Karditsa group focused on transitioning food deliveries done on motorbikes to electric bikes, which will cut air pollution in the busiest part of the city. Now, there's a waitlist of 30 businesses hoping to test out bicycle-powered logistics.

Other fixes could range from truck electrification to the creation of centralized hubs where customers can walk to pick up packages rather than having multiple trucks delivering door to door.

SURF has also developed an online course to help spread the impact of the work to cities it has not yet reached. And with the help of Freight Matters, SURF is putting together two reports aimed at helping small- and medium-sized cities develop partnerships focused on logistics challenges.

“Smaller and medium-sized cities don't get the attention they need,” Rothbard says. “We want to put urban logistics on the map so that by 2030, cities are ready to reach their climate goals.”

Liz Galst



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## Less soot, more action

EPA's proposal to reduce soot pollution doesn't go far enough, experts say.

**I**N EARLY 2023, THE U.S. ENVIRONMENTAL Protection Agency took an important step toward slashing a tiny but toxic pollutant that's inhaled daily by millions of people — soot. But experts, including EDF scientists, have been urging the agency to go further to protect public health and save lives.

Soot is primarily created by burning fossil fuels. It's exceptionally harmful because it's made up of tiny particles that can evade the body's defenses and burrow deep into the lungs. Some may even reach the bloodstream. Those particles are linked to a variety of health issues including asthma, heart attacks, strokes — even cancer.

“Fine particle air pollution is responsible for more than 110,000 deaths in the U.S. each year and its harm is not distributed equally,” says Environmental Defense Fund health scientist Ananya Roy. Exposure to soot is especially harmful to children and elderly people.

Despite the EPA being required by the Clean Air Act to review air quality standards every five years, it has not addressed soot pollution for a decade.

According to scientists, lowering the allowable air concentration of soot pollution

to an annual average of eight micrograms per cubic meter — from the current standard of 12 — would save 16,000 lives a year and improve the health of millions more.

**“ Fine particle air pollution is responsible for more than 110,000 deaths in the U.S. each year and its harm is not distributed equally. ”**

— EDF health scientist Ananya Roy

But on January 6, the EPA proposed reducing the allowable annual average concentration to 9 or 10 micrograms per cubic meter, not 8, leaving thousands of lives in the balance.

Further disappointing experts, the agency left the allowable daily average level unchanged at 35 micrograms. Instead, it chose to take public comment on changing the daily standard. EDF scientists recommend strengthening

the annual standard to 8 micrograms per cubic meter and the daily limit to 25 micrograms per cubic meter.

“The EPA has a vital opportunity to finalize more protective standards and strengthen daily standards to be consistent with the scientific evidence,” said Peter Zalzal, a lawyer for EDF.

Soot pollution is typically highest near highways, power plants, warehouses and transportation hubs like ports. Communities that border these types of facilities — often home to families with low incomes — face the highest health risks. Research also shows that Black and Hispanic communities have been bearing the brunt of the health issues caused by soot pollution.

In a report EDF released in 2022, scientists found that Black seniors in the U.S. are three times more likely to die from exposure to fine particle pollution than seniors of other races.

“Stronger standards consistent with the health science can help to ensure healthier, longer lives for millions of people in all parts of the country,” said Zalzal.

The standards are expected to be finalized this summer.

Vanessa Glavinskas

# Dairy giant steps up on climate

Bolstered by a new partnership with EDF, Danone pledges to slash methane emissions.

**O**NE OF THE WORLD'S LARGEST dairy companies is making a major moo-ve to help curb climate change.

In collaboration with EDF, Danone, which owns popular brands like Activia and International Delight, announced it will reduce methane emissions from the farms supplying its milk by 30% in the next seven years. This is the first methane-specific climate commitment by a major food company and the first such partnership on livestock methane.

Methane is a powerful greenhouse gas. EDF research has shown that current methane pollution could warm the planet more over the next 10 years than all of the carbon dioxide from burning fossil fuels. Cutting methane is the fastest way to slow global warming. Globally, farming is responsible for around 40% of man-made methane emissions. And the dairy industry alone accounts for about 8%.

"We are delighted to be working with EDF to scale and accelerate our work to reduce methane," says Chris Adamo, Danone's vice president of public affairs and regenerative agriculture policy. "While we face challenges ahead, Danone won't be starting from scratch. We've been working with farmers for many years to reduce emissions and improve soil health."

Danone will be using many tools to reach its goal. Optimizing herd health, improving feed quality and using new feed additives can significantly reduce the methane cows burp up from their digestive system — the source of 70% of methane emissions from cows. And careful management and processing of manure can reduce the emissions released as manure decomposes. But these solutions come with a price tag. Using

a solid-liquid separator for manure management, for example, avoids or reduces methane emissions but can cost hundreds of thousands of dollars.

"Farmers should not, and, in many cases, simply can not shoulder these costs on their own," says Katie Anderson, who leads EDF+Business's work with food and agriculture companies. "That's where EDF comes in. We are leveraging our economic expertise and strong science and market approach to help develop the innovative funding models to drive change on farms."

Last year, working with the Food and Agriculture Climate Alliance, EDF helped

model is working and how it can be improved or scaled up.

While agriculture is a major driver of climate change, soaring temperatures and unpredictable weather patterns threaten the very future of farming, too. Dairy cows are prone to heat stress, which reduces how much milk they produce by 15–20%. The USDA's Economic Research Service estimates that by 2030, 99.8% of U.S. dairy farms will produce less milk because of warmer temperatures. And the impacts are already being felt. Last summer, a heatwave in Kansas killed thousands of cows, and in France, some cheesemakers had to halt production because the pastures their cows depend on were scorched.

Of course, Danone is just one company in a long supply chain that sells dairy. So EDF is working with companies across that supply chain to catalyze methane reductions.

"We're making the case to companies that they can't meet their climate goals without addressing methane in their supply chains," says Anderson. "If all the companies across the supply chain from grocery stores, to restaurants, to dairy cooperatives work together and chip in to support the transition to climate-smart agriculture, everyone wins."

Finally, EDF is considering how agricultural financial incentives, like loan products,

can help farmers pay for the technology and products they need to make their farms more climate-friendly. EDF has experience with this model through its work on the Regenerative Agriculture Finance LLP Fund, which offers corn and soy producers a rebate if they meet certain environmental criteria. A similar program could be developed specifically for dairy farmers who can show that they are slashing methane emissions.

"We have the technology, we have the public awareness and growing momentum from businesses and governments," says Anderson. "Now, it's time to mobilize the market to meet this moment."

Joanna Foster



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secure a major victory when the U.S. Department of Agriculture announced a first-of-its-kind, \$3.1 billion investment to support pilot projects that develop and expand markets for crops and livestock farmed in ways that reduce greenhouse gas emissions or sequester carbon. Through this program, Danone and its partners won a \$70 million grant, part of which will go toward new manure management equipment on dozens of U.S. dairy farms.

EDF will also be evaluating how this sort of public-private investment



## 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](https://edf.org/wilson)



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# Insurance for a disaster-prone planet

A rise in devastating weather events reinforces the case for urgent reform.

**T**HANKS TO A FEDERAL DISASTER declaration, people in six California counties who endured weeks of torrential rain and flooding this winter may be able to access a pool of federal aid to assist in their recovery. But that aid can be meager, take months to reach people and often fails to reach those who need it most, says EDF economist and disaster relief expert Carolyn Kousky.

As climate change brings wave after wave of extreme weather, people across the country are more vulnerable than ever to disasters and the financial devastation that can follow. Some governments (like California's) are already cutting climate pollution and figuring out how to get people and infrastructure out of harm's way. But financial tools like insurance — unloved as it may be — also have a role to play in climate resilience.

“Insurance can provide critical financial protection after a disaster, but right now, it's failing many people,” says Kousky.

## Gaps in insurance coverage

Disaster insurance tends to be expensive, if it's available at all. That's partly due to the way traditional insurance is designed — it's meant to pool risk to cover an accidental event. If one customer out of a 1,000 has a burst pipe, there's plenty of money in the insurance pool to cover their damages.

But when a hurricane or wildfire flattens an entire town, everyone files major claims all at once. Insurance companies, facing heavy losses and even bankruptcy, are pulling up stakes in California, Florida and Louisiana.

**98%** of California properties are not covered by flood insurance.

Source: AP News

In California, 98% of homeowners don't have flood insurance. That means the vast majority of people affected by this winter's severe flooding are relying on personal savings, loans and possibly a few thousand dollars in Federal Emergency Management Agency (FEMA) aid to recover from the disaster. That in itself is a recipe for disaster, especially for lower-income families. Numerous studies have shown that FEMA aid tends to flow toward whiter, more affluent households who can afford to wait a few months for a check and who have the time and resources to navigate the demanding application requirements.

“People end up draining their retirement savings,” says Kousky. “We see low-income families fall behind on bills or stop spending on health care. Without insurance, disasters can be really damaging.”

It's not just in drought-prone California where people aren't insured against floods. Nationwide, around 70% of residences in FEMA-designated high-risk areas lack flood insurance. And, FEMA maps are widely considered to underestimate flood risk, because they don't account for climate change or for inland flooding due to rainfall.

## Testing a new approach

Kousky and others are on a mission to make insurance more inclusive. A pilot project she helped design hints at how insurance can be rethought to reach more people with less cost — so everyone has a fair shot at recovering when disaster strikes.

Developed in collaboration with the New York City Mayor's Office of Climate and Environmental Justice, the Center for NYC Neighborhoods and disaster recovery nonprofit SBP, the project uses a type of insurance rarely seen in the United States. Common in less wealthy countries, parametric insurance provides rapid cash payouts immediately after a disaster, without any paperwork or a visit from a claims adjuster. The payouts are automatically triggered by a measurable event, such as wind speed or flood water levels.

In the pilot, Center for NYC Neighborhoods is using a parametric insurance



policy to finance a program that will make emergency cash grants after flooding from heavy rainfall, like the flash flooding that killed 13 people in the city in 2021. Covered households could receive up to \$10,000 within days if they're affected.

That quick infusion of discretionary cash can make a big difference. According to a 2021 Federal Reserve survey, nearly one in three American households don't have enough cash on hand to cover a \$400 emergency expense. And disaster expenses often extend beyond property damage, says Kousky.

"What if your power is out and you need a generator? What if you can't get to work and you lose income? Or schools close and you need child care? Traditional insurance does a good job of protecting property, but doesn't always match the reality of what people are facing in their daily lives," says Kousky.

A parametric trigger for rainfall has never been devised before, says Kousky. "It's very new, so we're going to keep learning from it and adjusting," she says. But her hope is that it can be a valuable tool for protecting lower-income populations. South Carolina and several cities in California have already expressed interest.

### Reducing climate risk

Another intriguing possibility for insurance reform is using it to prevent damage, not just to aid recovery. In Kenya, cattle farmers can get parametric payouts at the first sign of drought so they can stock up on feed. In Canada, 15 major insurance companies are teaming up with Ducks Unlimited Canada to invest in wetlands protection to reduce flooding.

And in the U.S., EDF is working with a leading insurer to reduce climate risk. One possibility: Insurers could encourage oil and gas companies to reduce climate-polluting methane leaks by requiring them to meet emissions control criteria in order to qualify for coverage.

Of course, insurance alone can't save a society that ignores the risks posed by climate change.

"We also need to be thinking about building codes, land use, and how and where to build after a disaster," says Kousky. "Playing with the structure of insurance isn't going to get us out of this. We have to reduce risk." ■

*Shanti Menon*

## UNEQUAL RECOVERY

Financial support such as insurance and federal aid is critical to disaster recovery. Studies show that wealthier people have more access to disaster relief than less affluent people.



PHOTO COMPOSITE BY TINK TANK STUDIO

## BUILDING BACK BETTER



Barbara Thomas has a storm-fortified roof on her home in Birmingham, Alabama.

IBHS.ORG

One way to take the sting out of disaster recovery is to build stronger. A strong roof is often key to minimizing extreme weather damage, say experts from the nonprofit Insurance Institute for Business & Home Safety.

Using decades of real-world data and testing from their research facility in South Carolina —

where full-sized demonstration homes are subjected to rain, hail and hurricane-force winds — IBHS has created a set of voluntary building standards called FORTIFIED™.

Nearly 50,000 U.S. homes currently meet FORTIFIED standards, mostly in the Southeast. In North Carolina, these homes were 35% less likely to suffer damage during Hurricanes Matthew, Dorian, Florence and Isaias, which all struck during the turbulent period of 2016–2020; any claims filed were \$3,000 less than non-FORTIFIED homes.

"If you drive through a neighborhood after a storm, you can tell which home is FORTIFIED. It's the one that doesn't have a blue tarp on the roof," says managing director Fred Malik, a former home builder.

In several states, residents can get grants to build FORTIFIED roofs and receive insurance discounts for meeting the standards. California insurance regulators are also looking at a new wildfire standard developed by IBHS. The institute has developed a FORTIFIED multifamily home standard and is investigating ways to improve the durability of mobile homes. "If we can reduce losses, we can keep insurance rates down and keep people in their homes, and not have communities torn apart," says Malik.

# Dumpster-free decluttering

Forget the landfill. You can give your old stuff new life.

**I**F YOU'VE JUST DONE YOUR ANNUAL SPRING CLEANING, OR if decluttering guru Marie Kondo recently inspired you to get rid of all the unloved stuff in your home, right now you might be sitting on a lot of unwanted junk. Tempting though it might be to toss it all in the trash, there are better ways to get rid of it. After all, landfills often discharge dangerous chemicals into local water sources and definitely release climate-polluting methane and carbon dioxide into our atmosphere.

Here are five Earth-friendlier ways to get rid of the things you don't need:

## 1 Yard sale!

Your junk is someone else's treasure. You can go old school, post a few flyers, set out your wares on your stoop or driveway and rake in the cash as neighbors and bargain seekers come by. Websites like Garage Sale Finder and gsalr.com list local yard sales, while others, including ThredUp, Poshmark, eBay, Facebook Marketplace, Bookoo and OfferUp, act as virtual stoops. Either way, the cash you make can add up.

## 2 Pay it forward

All those rubber bands you liberated from the junk drawer? Egg sellers at the farmers market, your local librarian and the office at your kids' school will thank you for them. Office clothes you no longer need can do good work helping under-resourced job seekers through organizations like Dress for Success and 100 Suits. Books you've already read? Check online for a Little Free Library, a free-standing give/take community bookshelf, near you. And, of course, thrift shops accept resellable items to support their missions — a win for giver and seller alike.

## 3 Give it away

There is almost no end to the stuff people will happily take off your hands for free. Seriously. Even a gallon of unwanted pickle juice in New York City reportedly found a new home through a local Buy Nothing group. There are 128,000 of these groups worldwide — online communities

by posting on Facebook or through an app. Freecycle works much the same way.

## 4 Take care with hazardous household waste

Paint, pesticides, e-waste, motor oil, aerosol cans, cleaning products and solvents — these can be toxic, corrosive or flammable. Try to give away anything you don't need. (See #3 Give it away.) Then, take advantage of the recycling programs offered by large retailers such as Best Buy, Staples, Home Depot and Autozone that take electronics, compact fluorescent lightbulbs, car batteries and other things you didn't know could find new life as new products. Finally, check with your local sanitation department to learn how to safely dispose of hazardous household waste. Many host disposal events or offer drop-off sites.

## 5 Don't trash good food

There are a lot of people who need the food you're not using — almost 34 million are food insecure in the U.S. alone, according to U.S. Department of Agriculture. You can help by donating healthy, safe food in a number of ways. Community fridges, popping up on a growing number of sidewalks, allow neighbors to share food by leaving what they have or taking what they need. You can find them online or even start your own. Your local food pantry is another resource. Some police stations accept nonperishable food on food pantries' behalf.

Liz Galst



## RESOURCES

A quick Google search will lead you to all the websites mentioned above. Here are a few to get you started.

Buy Nothing [buynothingproject.org](http://buynothingproject.org)

Dress for Success [dressforsuccess.org](http://dressforsuccess.org)



## ★ YOU GOT THIS DONE!



Students (left to right) Henry Schuellerman, Elliot Wilson-Woodrow and Bri Knight get out the vote.

## Calling all climate voters

**E**LECTING PRO-CLIMATE POLITICAL candidates is one of the most impactful ways to help fight global warming. Yet many of the Americans most concerned about climate — those ages 18 to 24 — are also among the people least likely to vote.

Last fall, students at Ohio State University in Columbus decided to do something about that. The group is part of a national EDF affiliate, Defend Our Future, that empowers young people to take action on matters of environmental justice, clean energy and climate solutions.

“We wanted to get young people engaged in ways they hadn’t been in previous elections,” says OSU junior Henry Schuellerman.

The group created a get-out-the-vote event before the November election, setting up iPads on tables on one of the city’s busiest streets to meet students heading home from classes and Columbus residents leaving work. With a Defend Our Future banner tied to a nearby fence, the group went to work talking with passersby.

“We tried to create a judgment-free environment where we could encourage people to vote and to develop a plan for getting to the polls,” says Addy Zenko, an OSU senior. Visitors used the group’s laptops to check if and where they were registered to vote.

The group’s nonprofit status meant they couldn’t endorse candidates. But

they could talk with voters about how to find out where their candidates stood on climate action.

“Not supporting individual candidates allowed people who didn’t agree with us entirely to come up and have conversations,” Schuellerman says.

Their efforts were appreciated. One student needed help locating the address of her polling place. Another thought he’d have to drive three hours home to Toledo to vote, but with Defend’s help, learned he could file a provisional ballot with the nearby board of elections.

Organizing a get-out-the-vote event can be complicated. Depending upon the location, there are different government rules and regulations to comply with.

“Defend equipped us with a plan tailored to each state,” says Zenko. “They helped us navigate the pretty byzantine voting legislation and learn what we could and couldn’t do.”

Young voters concerned about climate and other issues appeared at polls in almost record numbers last November. The students of Ohio State University helped create that wave.

Liz Galst

**Help get out the vote** with Defend Our Future at [defendourfuture.org](https://defendourfuture.org); the League of Women Voters, [lwv.org](https://lwv.org); and Voto Latino, [votolatino.org](https://votolatino.org), which offers resources in both Spanish and English.

## ? YOUR QUESTIONS, ANSWERED

### EARTH-FRIENDLY SUNSCREEN?

I’ve heard that a lot of sunscreens can be bad for coral reefs and other forms of life in oceans, lakes and other waterways. **Are there ways I can protect my skin without hurting our oceans, rivers and lakes?**

– Jenny Liakmani, Illinois

**Sunscreens help to keep us humans healthy, but they can have a negative effect on underwater life.** To minimize the harm, EDF marine scientist Monica Moritsch recommends covering up with sun-protective hats, rash guards and other clothing to reduce the need for sunscreen. Second, avoid products that contain harmful chemicals such as oxybenzone, octinoxate and parabens. Mineral-based sunscreens that contain zinc oxide and titanium dioxide are less likely to harm coral reefs. And be sure to look for the non-nano label, since coral will not ingest larger particles. These approaches can help protect aquatic creatures while we protect ourselves.



PHOTO COMPOSITE BY TINK TANK STUDIO

## WE’RE ALL EARS

Got an environmental question you want answered or a success story, like the Defend Our Future get-out-the-vote event, to share? Let us know at [editor@edf.org](mailto:editor@edf.org).

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