Union of Concerned Scientists

Catalyst

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Fossil Fuel Companies on the Defensive

Is Big Oil Headed for a Reckoning?

Rebuilding Federal Science

Air Quality Data in the People's Hands

[Union of Concerned Scientists

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EDITORIAL DIRECTOR
Seth Shulman

MANAGING EDITOR
Bryan Wadsworth

PRODUCTION MANAGER
Heather Tuttle

EDITOR
Pamela Worth

CONTRIBUTING WRITERS
Elliott Negin
Michelle Rama-Poccia
Cana Tagawa
Claudia Ward-de León

LAYOUT & DESIGN
Rigsby Hull

ART DIRECTOR
Anthony Eyring

CONTRIBUTING DESIGNERS
Bill Cotter
Nick Iannaco
Omari Spears

FRONT COVER
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The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with people across the country, we combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

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CHAIR
Anne R. Kapuscinski

PRESIDENT
Johanna Chao Kreilick

NATIONAL HEADQUARTERS
Two Brattle Square
Cambridge, MA
02138-3780

PHONE
(617) 547-5552

EMAIL
ucs@ucsusa.org

WEB
www.ucsusa.org

Speaking Scientific Truth to Polluter Power

In the face of our intensifying climate crisis, it can feel enormously frustrating to watch fossil fuel companies continue to deflect responsibility year after year for their role in polluting our planet.

The companies have moved in recent years from outright denial of their role in our global climate emergency to responses based on a broader deception playbook. They are downplaying the urgency and delaying action. Working to shift blame to individual consumers (as the tobacco industry did). Touting their paltry investments in renewable energy. And claiming that people and communities will suffer more from transitioning to clean energy than from maintaining business as usual—an approach that has made their top executives among the richest people in the world.

As someone who worked to hold fossil fuel polluters accountable in my prior role as climate lead for the Open Society Foundations (OSF), I followed October's testimony with interest, irritation—and a lot of hope. For 10 years at OSF, I helped deploy the power of law and economics to target Big Oil and Gas through climate litigation and shareholder advocacy campaigns in the United States. Having been in this fight for a while now, I can tell you that something feels different about it today.

BP, Chevron, ExxonMobil, Shell, and others aren't getting the benefit of the doubt anymore. Through the persistent efforts of lawyers and shareholder advocates, and the voices and actions of a growing wave of concerned laypeople, especially youth, the polluters are losing their license to operate with impunity.

Today, I am incredibly proud to lead UCS as the preeminent organization putting science into the hands of the public officials, litigators, investors, and advocates who are holding the fossil fuel industry's feet to the fire. Our science-based analysis, advocacy, and

(continued on p. 20)

Photos: Bonnie Jo Mount/The Washington Post via Getty Images (refinery); Tara Rice (Johanna Chao Kreilick)

WHAT OUR SUPPORTERS ARE SAYING

Here's a sampling of recent feedback from the UCS Facebook page (www.facebook.com/unionofconcernedscientists) and Instagram account (www.instagram.com/unionofconcernedscientists). Find us also on Twitter (www.twitter.com/ucsusa).

ON 2021 BEING AMONG THE DEADLIEST AND COSTLIEST YEARS FOR CLIMATE DISASTERS

JoAnne McIntire:
I live in the Sierra Range of California. I've been considering moving somewhere else that would be better in terms of climate change. But now the area I was considering is being hit by things like unbearable heat [waves] and floods. You wonder if there's anywhere that will be less impacted.

Susan J Broatch:
I live in [western] Canada. In the past 8 months we've experienced a heat dome that killed elders, record-breaking torrential rainfall that caused massive flooding in farming districts, and the longest and worst cold snap in 52 years, along with record-breaking snowfall. And it's only going to get worse.

ON DISINFORMATION CAMPAIGNS CREATED, FUNDED, AND DISSEMINATED BY BIG OIL

Craig Shields:
It is said that Big Oil has entered its "Big Tobacco" phase, meaning that it needs to go to ever more obscene lengths to sow doubt into the public's mind regarding the damage its products cause.

Hazel Chandler:
It is time the truth comes out and we hold those involved accountable. We have a small window of opportunity to act, and we cannot afford to let the fossil fuel lobby buy our elections and stop us from action.

ON HOW RURAL DRIVERS CAN BENEFIT FROM ELECTRIC VEHICLES

Sierra Club/Thomas Hart Benton Group:
Good take by UCS. Clean energy solutions need to be made available for everyone!

Georgeann Kepchar:
When your current F-150 finally goes to the big junkyard in the sky, an EV F-150 is a good choice. Many rural folks have discovered the utility of portable electric tools of all kinds. John Deere has electric tractors. No need to have diesel delivered and stored. Even on the farm, electric is the future.

ON UCS EFFORTS TO INFORM THE BIDEN-HARRIS ADMINISTRATION'S POSITION ON NUCLEAR WEAPONS

Steven Corradi:
When one looks back on all of the nuclear weapons accidents and near-accidents, it's mind-boggling that we still want to keep these things.

cayecrab:
We must take responsibility for dropping this horrendous bomb two times and work to be sure that it never happens again.

Tina Krauz:
We need safeguards more than ever due to the warring nature of our power players.

[IN THIS ISSUE]

Introducing the 2021 Science Defenders

Each year, the Union of Concerned Scientists names several individuals or groups of people as Science Defenders: those who have taken an admirable stand for science and the public good. We're proud to present our 2021 honorees.

FIGHTING FOR ACADEMIC FREEDOM

Drs. Sharon Austin, Michael McDonald, Jeffrey Goldhagen, and Daniel Smith: Last year, the University of Florida system attempted to prevent these faculty members from offering expert testimony in court, claiming their testimony could conflict with state-promoted policies—but the faculty fought back. Dr. Goldhagen, a pediatrician, stood up for his right to submit a statement against banning school mask mandates. The other professors, who teach political science, fought to present expert testimony in a case challenging a law that restricts voting access. While the university eventually relented, the professors filed a federal lawsuit to ensure their—and other Florida faculty members'—right to free speech.

SERVING HIS COMMUNITY AS A TRUSTED RESOURCE

Kennard Perry: Especially early in the pandemic, demographic surveys found that Black people in the United States tended to be less likely than White people to get vaccinated against COVID-19. At the Black-owned barbershop where he's worked for more than two decades, Perry has provided science-based information about the safety and efficacy of COVID-19 vaccines to his clients, many of whom have confided in him their hesitation about vaccination. "Black people are at the front line of this pandemic," he says. "I have a responsibility to my community."

EDUCATING FUTURE BLACK WOMEN LEADERS IN NUTRITION

Tambra Raye Stevenson: When members of Stevenson's family were diagnosed with diabetes and heart disease, she recognized that a determining factor was a food system fraught with racial inequity. Stevenson founded WANDA: Women Advancing Nutrition Dietetics and Agriculture, a nonprofit organization that works to improve access to nourishing food and free nutrition classes in the Washington, DC, area, and to provide women and girls of African descent opportunities to be community leaders on the issue of nutrition.

DEMANDING JUSTICE FOR CHICAGO'S SOUTHEAST SIDE

Stop General Iron: When General Iron, a car- and metal-shredding business, announced it would site a scrapyard in Chicago's majority-Latino Southeast Side, environmental justice groups and community leaders banded together. Stop General Iron activists petitioned Chicago's health department to deny the business an operating permit, filed a civil rights complaint with the Department of Housing and Urban Development, and called for intervention from the Environmental Protection Agency on the basis of the environmental issues the proposed site raised. The permit for the facility is now on hold.

Illustration: Omari Spears/UCS

Putting a Stop to a Toxic Pesticide

Last August, the Environmental Protection Agency (EPA) took the welcome—but long overdue—step of banning the use of the pesticide chlorpyrifos on food crops, eliminating a threat to farmworkers, their families, and rural drinking water. UCS had been involved behind the scenes to bring about this decision for several years.

Chlorpyrifos is derived from a class of World War II–era nerve agents. Because even small amounts have been shown to hinder the development of children's brains, potentially leading to lower IQ and autism, scientists and scientific organizations including the American Academy of Pediatrics had called for it to be banned. In 2000, the EPA did indeed ban chlorpyrifos from household use, but allowed its agricultural use to continue. The agency was moving in the direction of an outright ban before Donald Trump became president, but a little more than two months after his 2017 inauguration—to which chlorpyrifos's manufacturer, Dow Chemical, contributed $1 million—the EPA scrapped its proposed ban, rejecting the advice of its own scientists and two federal court orders. UCS analysis found that nearly 2 million children under the age of five in agricultural communities were likely facing increased risks of neurological damage as a result.

That injustice, largely falling on families in low-income communities and communities of color, was "appalling," says Genna Reed, senior scientist with the Center for Science and Democracy at UCS. "That harm was preventable but for the previous administration's deliberate refusal to do anything about it. By finally banning chlorpyrifos, [the EPA's new leaders] are demonstrating that they'll listen to the evidence and act to protect public health."

Too Chicken to Take on "Big Chicken"?

Following our groundbreaking report on the wide-ranging toll of Tyson Foods' monopolistic business practices in Arkansas, which we featured in the Fall 2021 issue of *Catalyst*, UCS sought to raise local awareness and pressure executives by placing advertisements in Northwest Arkansas—home of the company's headquarters in Springdale—calling out Tyson's bad practices.

Unfortunately, it appears some news organizations and businesses in the area are afraid to ruffle the company's feathers.

Ads calling out Tyson for mistreating workers, polluting nearby communities, and stamping out competition were bluntly rejected by the local newspaper publisher as too hard-hitting, even though we backed them up with rigorous research and independent reporting. A digital billboard ad (shown here) was similarly rejected by the small executive airport in Springdale on the grounds that it would offend the airport's clientele . . . which, presumably, includes Tyson executives. Judge for yourself how offensive it is. (Right?)

This setback only strengthened our resolve, and in February we managed to land an op-ed from a UCS scientist in the *Arkansas Democrat-Gazette*, on how Tyson hurts the local economy with its business practices. We're just getting started in our campaign to rein in Tyson and other "Big Chicken" companies' exploitative practices. Stay tuned for more in the next edition of *Catalyst*.

Photo: Jinning Li/Shutterstock; ad: Omari Spears/UCS

Illinois Adopts a Path toward Clean, Equitable Energy

UCS and our supporters have multiple reasons to celebrate Illinois's adoption of the Climate and Equitable Jobs Act (CEJA), which Governor J.B. Pritzker signed into law in September 2021.

First, the state took the bold step of becoming the first in the Midwest to pass legislation that will phase out fossil fuels in its power sector, charting a path to achieve 100 percent carbon-free electricity by 2045. While owners of coal-fired power plants have already been closing facilities in Illinois, that energy has been largely replaced with gas: five times as much electricity is generated by gas-fired power plants in Illinois today than in 2010—and pollution from gas is now responsible for more deaths and higher health costs in the state than coal. Where renewable energy accounts for only 9 percent of Illinois's electricity today, the new law will boost that figure to 50 percent by 2040.

Second, Illinois's new energy law combats climate change by slashing carbon emissions not only from electricity generation but transportation as well—now the largest source of heat-trapping pollution in the state and the nation. The legislation provides up to $80 million annually over the next 10 years to electrify the state's transportation sector, including rebates for electric vehicles and charging infrastructure. These measures are expected to help put a million new electric vehicles on the state's roads by 2030.

Third, the law prioritizes an *equitable* clean energy future for all Illinoisans based on dialogue with community and environmental justice organizations throughout the state. As a result, it dedicates 45 percent of its transportation funding to historically marginalized communities; allows utility customers to finance energy efficiency upgrades to their homes; expands access to quality jobs in the clean energy industry, including training for formerly incarcerated people; and provides $40 million a year for communities where a coal mine or fossil fuel–fired power plant has closed (or will be closing). It even goes so far as to make public utilities' profitability contingent on taking steps to make the electricity grid cleaner, more affordable, and more equitable, as verified by a compliance officer on an annual basis.

THE NEW LAW COMBATS CLIMATE CHANGE BY **SLASHING CARBON EMISSIONS** NOT ONLY FROM **ELECTRICITY GENERATION** BUT **TRANSPORTATION** AS WELL.

The passage of CEJA followed three years of work by UCS as part of the Illinois Clean Jobs Coalition. During that time, we co-hosted and presented at dozens of events, lobbied legislators through emails and in-person meetings, managed the coalition's Policy Committee, prepared fact sheets, and offered expertise on a wide range of issues.

Now, Illinois's legislation will serve as a blueprint for other states looking to take action on climate and clean energy in a just and equitable way. Jessica Collingsworth, lead energy policy analyst in the UCS Climate and Energy program, says, "CEJA's passage comes not a moment too soon, as the consequences of not acting on climate change are devastating. Thank you to everyone who worked tirelessly to get this bill across the finish line, including UCS supporters and members who contacted their legislators and participated in numerous actions. There is still much work to do to address the climate crisis but, for now, let's celebrate this monumental win for Illinois, the Midwest region, and the nation."

Photo: Archigeek/Creative Commons (Flickr)

UCS Campaign Manager Recognized as Environmental Justice Leader

On September 16, UCS Senior Energy Campaign Manager Elise Tolbert received a "40 under 40" award from Black Millennials for Flint as one of a number of outstanding young Black, Latino, and Indigenous leaders working on solutions to the climate crisis and environmental injustice.

Tolbert has been interested in public health and environmental science since she was a high school student in Alabama and first learned about Louisiana's infamous "Cancer Alley" (where a heavy concentration of petrochemical facilities has been linked to high rates of illness). When she realized these fields could be a career, Tolbert says, "It was a perfect fit for me—it was like getting paid to do community service."

With degrees from Tuskegee University and the University of Michigan, she has worked to bring water testing to rural communities in Alabama that bear the brunt of industrial pollution and a lack of sewer systems, with the EPA to research the impacts of air quality and extreme heat in public housing, and with the Climate Action Campaign to help amplify the voices of environmental justice groups.

Now, as manager of the UCS Power Ahead campaign, Tolbert is defining ways in which our organization can better work with a diverse array of partners to modernize the US electricity grid and transform our energy system. "I firmly believe that everyone deserves to live in a place that is conducive for their health—that their environment, and the quality of it, shouldn't be the one thing that holds them back from pursuing their own goals, dreams, and ambitions," she says. "That's why I do the work that I do."

In addressing the 40 under 40 recipients, EPA Administrator Michael Regan said, "Thanks to you, so much has already changed and so much is currently changing. You've sparked a national conversation not only about climate change and environmental justice but about the world—the kind of world we fundamentally want to create and leave, not only to your generation but the generations to come."

Congratulations, Elise—we're glad to have you leading the way at UCS!

Got Science? Named among Top 30 Sustainability Podcasts

The sustainability- and conservation-centered blog and news site Treehugger.com included the UCS *Got Science?* podcast on its list of the top 30 podcasts worth exploring. Citing our esteemed guest experts, focus on science and public policy, and Spanish-language episodes, the site says *Got Science?* is "an excellent, credible place to begin" for those interested in the science behind sustainability.

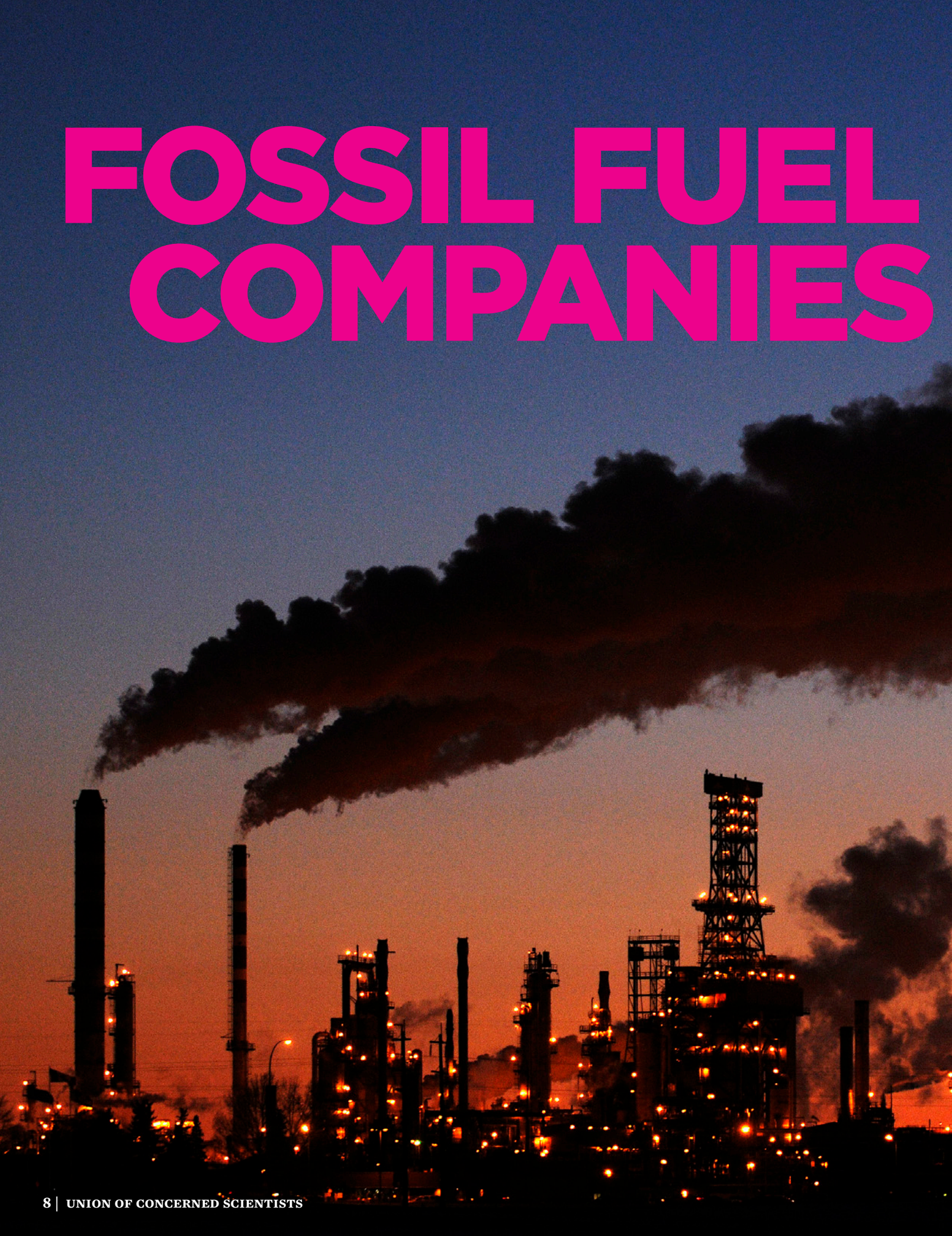
Local Nuclear Weapons Initiatives Gain Ground

In recent months, the cities of Boston and Cambridge, Massachusetts, along with Minneapolis, Minnesota, and Milwaukee, Wisconsin, joined hundreds of other towns, cities, and organizations calling on President Joe Biden and Congress to reduce the threat nuclear weapons pose to their communities and the world. More than 300 local and state officials in 41 states also sent a letter to the administration and Congress with the same demands. These efforts are part of Back from the Brink, a national grassroots coalition co-founded by UCS.

Back from the Brink makes it possible for everyday people—not just experts—to work with their local governments to advocate for abolition and policy change at the federal level. You can visit www.preventnuclearwar.org to help transform the conversation on national security and work toward a more inclusive, democratic process.

Additional "Advances" Contributors: Rich Hayes, Kyle Ann Sebastian

FOSSIL FUEL COMPANIES



ON THE DEFENSIVE

Ten years after UCS helped convene a key strategy meeting, it looks like Big Oil is headed for a reckoning.

BY ELLIOTT NEGIN

What a difference a decade makes.

In the summer of 2012, the Union of Concerned Scientists and the Climate Accountability Institute convened a meeting in La Jolla, California, to explore how the campaign that held the tobacco industry liable for damages might provide a guide for addressing the climate crisis. Many of the most prominent players who had successfully fought the tobacco industry were in attendance.

Like the tobacco industry before it, the fossil fuel industry had been spending millions of dollars on political campaigns, lobbying, advertising, bogus scientific studies, and a network of think tanks and advocacy groups to manufacture doubt about the science and prevent government action—and it was paying off. The companies had knowingly waged a disinformation campaign about climate science and managed to block needed action to slow the pace of climate change. Just three years earlier, the House of Representatives had narrowly passed a comprehensive climate bill only to see it die in the Senate, and the prospects of Congress doing anything else about global warming were dim.

The question before the two dozen scientists, lawyers, historians, and public opinion researchers who met that June was: Where do we go from here?

Rep. Carolyn Maloney of New York's 12th district, chairing the October 2021 hearing of the House Committee on Oversight and Reform. The hearing heard testimony from top executives from leading fossil fuel companies and trade groups about the fossil fuel industry's decades-long disinformation campaign.

Over two days, participants at the meeting discussed potential scientific, legal, and communications strategies to hold fossil fuel companies accountable. Based on the tobacco campaign, they identified three major prerequisites for success: first, they would need to access and publicize internal industry documents showing that the companies knew about the climate damage their profitable business-as-usual approach was causing. Next, they would need to build a science-based framework that could directly tie climate impacts such as higher temperatures and rising sea levels to emissions caused by specific fossil fuel companies. And, finally, to contain the existential threat posed by climate change, they would need to convince the public that swift action was required to hold these companies responsible and force them to change their planet-destroying business plans.

Ten years later, scientists, advocacy groups, academics, journalists, and legislators have made considerable progress on all fronts.

DAMNING INTERNAL DOCUMENTS DISCLOSED

As the tobacco experts at the La Jolla meeting recounted, the US Surgeon General had issued a landmark report linking cigarettes with lung cancer back in 1964, but it wasn't until the 1990s that lawsuits against the tobacco industry began to have limited success. That success was at least partly due to the fact that internal industry documents, obtained via leaks and legal discovery, showed that tobacco companies knew for years that tobacco is addictive, opening them up to conspiracy and racketeering charges.

Since La Jolla, damning documents have come to light that clearly show fossil fuel companies—like their tobacco industry counterparts—knew full well about the damage their products cause but launched disinformation campaigns to manufacture doubt and block government action.

In July 2015, for example, UCS released a report documenting that ExxonMobil and five other top carbon polluters—BP, Chevron, ConocoPhillips, coal giant Peabody Energy, and Shell—were cognizant of the looming climate crisis for decades but spent tens of millions of dollars promoting contrarian arguments they knew to be false. UCS also uncovered evidence that Exxon had been factoring climate change into its oil and gas extraction plans as early as 1981—much earlier than anyone had realized and years before there was much public awareness of the problem. Later in 2015, *InsideClimate News* and the *Los Angeles Times* dug up evidence from company archives and interviews with former employees for a series of articles that provided further details about what Exxon scientists knew and when they knew it.

Such revelations have emboldened state and local authorities to take action. Over the last five years, at least 29 states, counties, cities, and organizations have filed lawsuits against major fossil fuel companies for climate-related fraud or damages, or both (see the sidebar). Many of those cases, including those filed by Boulder, Colorado; Charleston, South Carolina; and Oakland, California, aim to hold specific companies liable for damages caused by climate impacts including

Photos: REUTERS/Dan Riedlhuber (p. 8); AP Photo/Jacquelyn Martin (Carolyn Maloney)

drought, wildfires, intensified storm surge, sea level rise, and increased flooding and precipitation. Other lawsuits, such as those filed by Massachusetts, Minnesota, and Washington, DC, charge that specific companies violated consumer protection and common laws by defrauding the public through false advertising and other misrepresentations about their products' risks. Among the defendants are BP, Chevron, ExxonMobil, Shell, and the American Petroleum Institute, the largest US oil and gas industry trade association.

Yet another confirmation of ExxonMobil's deceit surfaced last summer from an unlikely source. Caught in a secretly videotaped interview, an ExxonMobil lobbyist conceded that his company had colluded with "shadow groups" to block government climate action and publicly supported a carbon tax only because it assumed Congress would never pass one. The video, which was broadcast by British public television and reported widely by US news organizations, further undermined the company's credibility.

Citing the lobbyist's revelations and other evidence, the House Oversight and Reform Committee invited top executives from BP, Chevron, ExxonMobil, and Shell, and their counterparts at the American Petroleum Institute and US Chamber of Commerce, to appear at a hearing in late October to answer questions under oath about the fossil fuel industry's decades-long disinformation campaign. The CEOs' answers were hardly revelatory, but the hearing did yield an enormously important outcome: The committee issued subpoenas for internal documents from all the industry participants, documents that are very likely to add to an already strong case establishing their culpability.

ATTRIBUTION SCIENCE MATURES

Twenty-one of the 29 climate lawsuits currently in play cite UCS analysis, and their legal arguments are bolstered by research attributing carbon emissions and climate impacts to specific fossil fuel companies—a field pioneered by UCS and the Climate Accountability Institute, the two sponsors of the 2012 La Jolla meeting.

Richard Heede, the Climate Accountability Institute's cofounder and director, presented participants at that meeting with a preview of his pathbreaking project quantifying the annual and cumulative carbon emissions attributable to each of the world's major fossil fuel and cement companies. Published in November 2013, the peer-reviewed study found that just 90 companies were responsible for two-thirds of human-made carbon emissions since 1854—the dawn of the Industrial Revolution.

In 2017, a UCS research team led by Senior Climate Scientist Brenda Ekwurzel followed up Heede's study with a companion analysis. It found that carbon emissions from the 90 major fossil fuel producers' and cement manufacturers' products were responsible for nearly half of the global temperature increase, and about 30 percent of global sea level rise, between 1880 and 2010.

(continued on p. 21)

CLIMATE ACCOUNTABILITY FROM COAST TO COAST

Below is a list of the cities, counties, states, and organizations that, as *Catalyst* went to press, are currently involved in lawsuits against the fossil fuel industry—either for deceiving shareholders and the public about the realities of climate change, or to compensate them for the climate-related damages the industry has inflicted on them.

Photo: Karl Merton Ferron/The Baltimore Sun

STATES

Connecticut
Delaware
District of Columbia
Massachusetts
Minnesota
Rhode Island
Vermont

COUNTIES

Anne Arundel County, MD
Boulder County, CO
Honolulu County, HI
Marin County, CA
Maui County, HI
San Mateo County, CA
San Miguel County, CA
Santa Cruz County, CA

CITIES

Annapolis, MD
Baltimore, MD
Boulder, CO
Charleston, SC
Hoboken, NJ
Honolulu, HI
Imperial Beach, CA
New York, NY*
Oakland, CA
Richmond, CA
San Francisco, CA
Santa Cruz, CA

ORGANIZATIONS

Pacific Coast Federation of Fishermen's Associations

**New York City has filed separate lawsuits (damages and fraud)*

Is Ford's New Electric Pickup Truck a Game Changer?

INTERVIEW WITH DAVID REICHMUTH

Later this spring, Ford Motor Company will sell its first electric F-150 pickup truck, the Lightning, which has been in the works for years. Can you explain its significance?

DAVID REICHMUTH: Pickup trucks are the top-selling vehicles in the United States. Previously, there haven't been electric pickup trucks on the market from a major manufacturer. The F-150 is the top-selling vehicle model in the United States, so this is a big deal. It's important that we get larger vehicles out there that are electric.

How far will the F-150 be able to go on a charge?

DAVID REICHMUTH: The F-150 electric version is coming out in two models: one that gets 230 miles of range, and the other targeted to 300 miles of range.

How will the F-150 electric pickup compare with other electric vehicles?

DAVID REICHMUTH: Ford has emphasized that because the Lightning is an electric vehicle and has a large battery, it can actually be a source of electric power for a home or for a job site. They're trying to play up the advantages of the electric vehicle. With the correct hookup, the large-capacity battery has the ability to power [whatever you wish to power]. You can plug construction tools into the vehicle, for example, instead of using a separate generator. And unlike all the other generators out there that run off gasoline or propane, this is a zero-emissions power source. For the largest-range electric F-150, they're promising to be able to power a house for two to three days off your truck [on a full charge]. Additionally, while you typically have to add a bed cover if you want lockable storage for a pickup, the F-150 has a lockable front trunk because they've removed the engine and all the other equipment from the front of the vehicle.

I think that's something important about what Ford has done with this vehicle compared to one of its early electric vehicles. They've gone from a frame of, "Buy this car despite it being an electric vehicle," to, "Buy this car or truck *because* it's an electric vehicle—because it's better." That's where we need all the companies to go—to highlight why these cars are better.

Will the availability of an electric pickup truck help reduce emissions?

DAVID REICHMUTH: There's some good news here, and some bad news. The good news is that the Ford F-150 electric version is going to have much lower climate-changing emissions than the gasoline version, even when accounting for electricity generation. It will also emit no tailpipe pollution. The bad news is that the F-150 electric version would probably be one of the least efficient electric vehicles on the market, in terms of electricity used per mile driven, when it comes up for sale. For people who need a pickup truck, we'd want them to switch from the gasoline to the electric version. But if someone just needs a car—if they don't need the features of the pickup truck—I'd much rather have people go to a more efficient electric vehicle.

Who will benefit most from switching to an electric pickup truck like the F-150 Lightning?

DAVID REICHMUTH: Those who drive long distances regularly stand to benefit the most from switching to an electric vehicle because they'll save on fuel and maintenance costs, regardless of the state they live in or the type of

DAVID REICHMUTH is a senior engineer with the UCS Clean Transportation Program. His work focuses on analyzing new vehicle technologies and advocating for policies that support the increased electrification of transportation.

Dr. Reichmuth has testified at hearings before the US House of Representatives, the California state legislature, and the California Air Resources Board, and he is an expert on California's zero-emissions vehicles regulation. He earned MS and PhD degrees in chemical engineering from the University of California–Berkeley, where he investigated biological methods for reducing the sulfur content of fuels. Read more from David on our blog, *The Equation,* at https://blog.ucsusa.org.

Photos: Mike Olliver (David Reichmuth); marabelo/Adobe Stock (ad)

> ***The F-150 is the top-selling vehicle model in the United States, so this is a big deal. It's important that we get larger vehicles out there that are electric.***

vehicle they drive. In the United States, that means predominantly rural drivers, who travel distances that are on average 38 percent longer than workers in cities. So, when a driver in a rural area switches from a gasoline-powered car to an electric vehicle, the fuel savings can be up to twice as much as for an urban driver making that same switch. Longer driving distances and older vehicles in rural areas also mean more maintenance, but electric vehicles have significantly lower maintenance costs. The battery, the motor, and the associated electronics require little or no regular maintenance. For example, fully electric vehicles have no motor oil or spark plugs, and brake wear is much reduced because of regenerative braking.

Beyond the F-150, how can manufacturers get more electric vehicles on the market?

DAVID REICHMUTH: To encourage manufacturers to move quicker to electric vehicles, both federal and state regulations are an important tool. In California, we have zero-emissions vehicle regulations that require sales of electric vehicles, and those regulations have been adopted by 14 other states. At the federal level, there are fuel economy standards, which will hopefully be updated to include more stringent standards for emissions. Electric vehicles can be part of the way companies meet those standards.

Investing in infrastructure for charging is also going to be important—especially in rural areas, where charging stations are currently less convenient and accessible. People want to be able to know they can take their car wherever they want to go. Having more charging stations between cities, between major areas, is going to help. Money for infrastructure is also going to help solve the problem of getting charging to people who can't charge at home today.

Now that the F-150 Lightning is (almost) on the market, what do you want to see happen next in electric vehicle sales and production?

DAVID REICHMUTH: First, we want to eliminate as many tailpipes as we can. Turning all pickups into electric vehicles would be great for the environment and for trying to slow down climate change. Second, I would love to see the manufacturers shift their marketing so they're not trying to get everyone into an oversized vehicle.

Making pickups electric is great for the people who need pickups. Making minivans and SUVs electric is great for people who need vehicles of that size. But it's not great if everyone trades in their Prius for an electric pickup truck. {C}

REBUILDING FEDERAL SCIENCE UNDER BIDEN

The administration has made laudable commitments to restore scientific integrity in the federal government, but much work remains to be done.

BY TARYN MACKINNEY

It's painful to recall the state of our nation one year ago when the Biden-Harris administration took the helm. The country was reeling from the January 6 insurrection at the US Capitol, COVID-19 had already killed 400,000 people in the United States, and the pandemic-battered economy had shed millions of jobs.

On the campaign trail, Joe Biden promised to mend the country's wounds, recommitting the United States to combat climate change alongside global partners, and pledging to use science to beat back COVID-19 and fight for the health, safety, and dignity of marginalized groups, particularly people of color.

As the Biden-Harris administration's first year drew to a close, the Union of Concerned Scientists undertook a clear-eyed assessment of what has been accomplished so far and what remains to be done.

First, the good news.

The Biden-Harris administration has undone many of the previous administration's egregious missteps, which included, by our tally, nearly 200 attacks on science, scores of rollbacks of science-based policies, and a climate of hostility toward science that pushed qualified experts out of public service in droves.

The administration has also elevated the issues of racial equity and environmental justice, issuing two executive orders focused on racial equity and the environment in its first week alone. The administration pledged to dedicate at least 40 percent of energy and infrastructure spending to disadvantaged communities, and federal agencies have committed to racial equity through data transparency, stronger policy enforcement in communities on the front lines of pollution and climate impacts, and a more transparent and collaborative policymaking process, with multiple ways for frontline communities and advocates to offer input.

Illustration: Bill Cotter/UCS

Despite the fact that, as *Catalyst* went to press, the administration's signature Build Back Better Act remains frozen in Congress, the United States has re-entered the Paris Agreement and the global fight against climate change. It has committed to reducing US heat-trapping emissions 50 percent below 2005 levels by 2030 and taken a number of actions to support that goal, including an executive order directing federal agencies to center climate in policymaking.

The administration is also driving efforts to increase climate resiliency, advance clean energy development, finance climate-related investments globally, and incorporate the economic costs of climate change into the policymaking process. Nevertheless, as the dangers of climate change accelerate, the administration and Congress must move faster to cut emissions and support communities facing climate risks in the years to come.

You can read UCS's detailed assessments of the administration's progress (or lack thereof) in each of nine issue areas at www.ucsusa.org/resources/one-year-science-under-biden. In the meantime, here's a closer look at some of the report's data-driven findings about how federal science is faring.

MAKING SCIENTISTS WELCOME AGAIN

It goes without saying that robust science is vital to the federal government. Science provides the basis for sound decisionmaking, sometimes on life-and-death matters: every day, federal scientists are working to protect our food supply, study climate change, and prepare for natural disasters.

Yet the federal scientific workforce had eroded badly under the Trump administration, which curtailed or stalled research, forced scientific offices to move to different states, and undermined career staff. Some offices, battered by these political attacks, hemorrhaged experts: UCS found that, between 2016 and 2020, five federal agencies alone lost a total of more than 1,000 scientists.

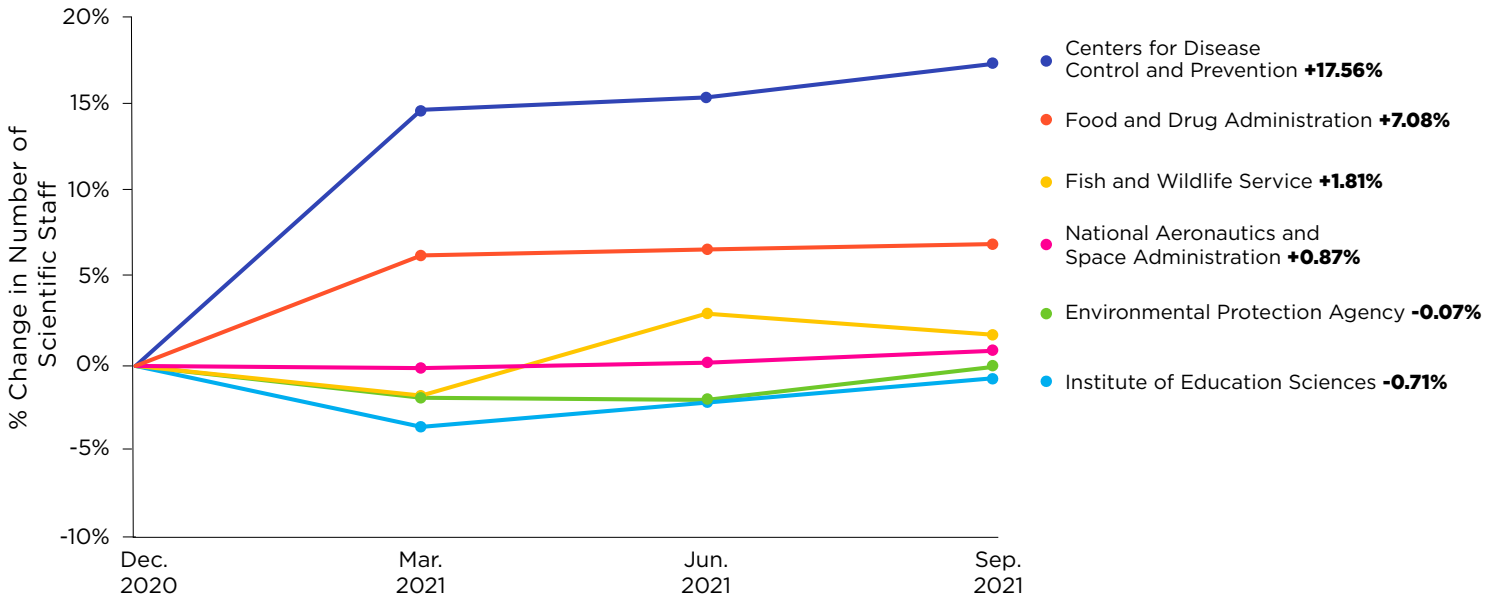
In its first year, the Biden-Harris administration took promising steps to revitalize the workforce. President Biden signed a memo requiring every science agency to have a chief science officer and a scientific integrity official. He took the unprecedented step of elevating his science adviser to the cabinet level, a move UCS has recommended for more than a decade. And in June, the president directed agencies to promote diversity, equity, and inclusion in their workforces.

Our analysis found that President Biden has also made substantial strides in tapping qualified scientists to serve in leadership positions. The administration has announced nominations for 84 of the roughly 100 high-level science positions that are selected by the president; 69 of these nominations have been finalized (including some requiring confirmation by the Senate). This represents a fast pace compared with prior administrations: in contrast, the Trump administration had announced only 43 nominations at the end of its first year and had finalized just 28 of them (including many lacking qualifications or with serious conflicts of interest). President Biden has narrowly exceeded the pace of the Obama administration.

UNEVEN HIRING PROGRESS ACROSS AGENCIES

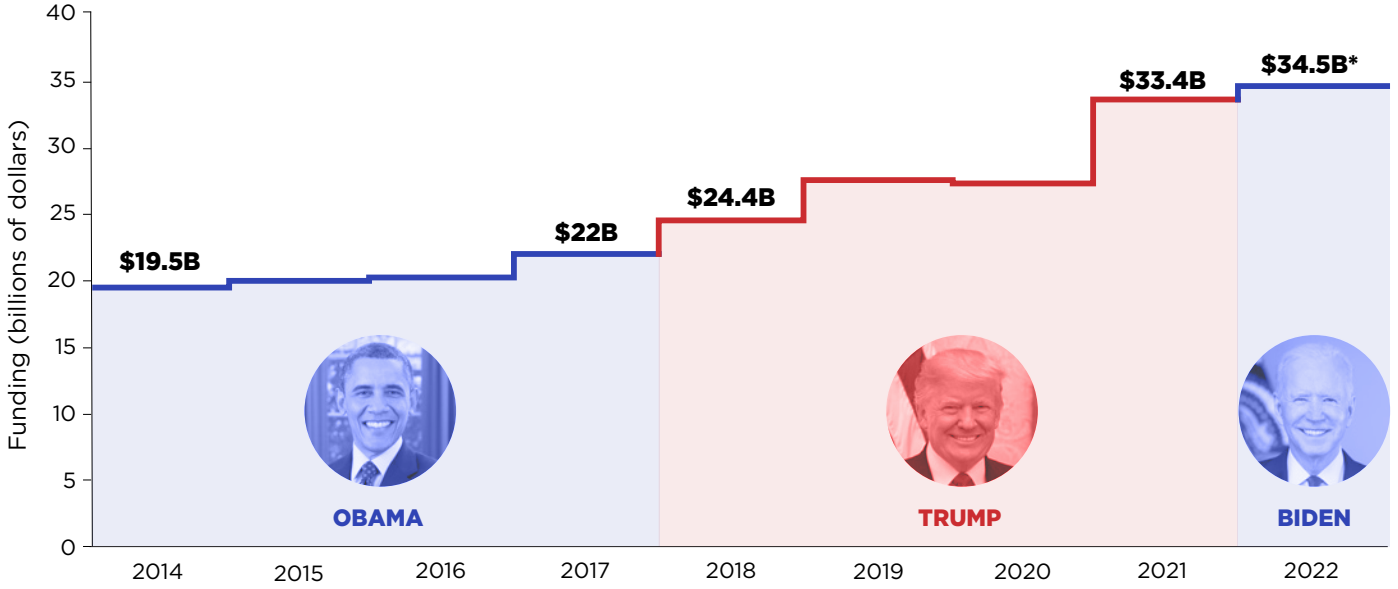
Overall, of the agencies we studied, public health agencies have fared best. The Centers for Disease Control and Prevention (CDC),

MIXED PROGRESS ON SCIENTIST HIRES



The previous administration left enormous holes in the government's capacity to conduct science. While the Biden-Harris administration has committed to rebuilding this capacity, its record so far is mixed.

BROKEN PROMISES ON NUCLEAR SPENDING



President Biden has requested increased funding for the US nuclear arsenal, bringing weapons spending to record levels—despite earlier commitments to reduce the stockpile.

the nation's foremost public health agency, has steadily grown since it was founded in 1946 with fewer than 400 employees. During the Biden-Harris administration so far, the number of CDC scientists has grown by about 15 percent since December 2020, reaching a record high of 8,486 scientists employed as of June 2021. The Food and Drug Administration (FDA), the CDC's partner in safeguarding public health, has grown as well. The Biden-Harris administration has hired roughly 1,000 new scientists at the FDA, representing a nearly 7 percent increase in its scientific workforce.

However, UCS analysis finds that hiring at other science-based agencies still lags.

The Fish and Wildlife Service, for example, lost 231 scientists under the previous administration, and has now gained back 181 as of June 2021. It's a good start, but not enough.

The same is true for the Environmental Protection Agency (EPA), which lost more than 1,000 scientists under the prior administration—hitting its lowest number of total staff members in more than 30 years. While the Biden-Harris administration has pledged to fill this gap, and EPA Administrator Michael Regan personally promised to hire more scientists, the agency saw a 2 percent *decrease* in scientists from December 2020 to June 2021.

And while President Biden announced efforts to diversify the federal workforce—and has nominated people of color to key leadership positions within agencies–it remains too early to see the fruits of the administration's goals in the data.

BUMPS IN THE ROAD AHEAD?

While the Biden-Harris administration has made significant progress toward some of its ambitious goals, much more work is needed in the years ahead to protect scientists and their role in decisionmaking. And making good on its promises on climate change and voting rights will remain a steep uphill climb.

Another problem spot according to the UCS analysis is the administration's failure to make good on its campaign promises to curb expenditures on nuclear weapons. Back in 2017, then-Vice President Biden said that pouring additional money into a nuclear buildup would increase tensions and "do nothing to increase the day-to-day security of the United States and our allies." Presidential candidate Biden reiterated his opposition to that spending on the campaign trail. Yet the White House's first budget request did nothing to scale back the previous administration's record spending on nuclear weapons, leaving the nation on track to waste more than $1 trillion on unnecessary upgrades over the next 30 years.

In the months to come, we'll be closely tracking the administration's actions on all these issues, celebrating progress, and demanding more when needed. In the meantime, we commend the important steps taken to boost federal science—and, as always, we call upon the administration to listen to the experts, speak the truth, and lead with science. The public is counting on it. {C}

Taryn MacKinney *is an investigative researcher for the Center for Science and Democracy at UCS. Read more from Taryn in our blog,* The Equation, *at https://blog.ucsusa.org.*

SCIENTISTS' HELP WANTED

If you are a scientist interested in working at a federal agency, UCS can help you navigate this process. Visit www.ucsusa.org/resources/federal-science-jobs for more information.

One Kansas City Neighborhood Is Taking Charge of Its Own Air Quality Data

By Michelle Rama-Poccia

Twenty-two years. That's how much shorter the average life expectancy is for people in the Armourdale neighborhood of Kansas City compared with the rest of the country.

For generations, too many people of color and people with low incomes have been relegated to living in unhealthy neighborhoods such as Armourdale, a status quo created and maintained by racial discrimination and economic inequality. As a result, they are chronically exposed to dangerous pollution from fossil fuel–powered local industry. This exposure puts residents at a higher risk of cancer and respiratory illness and contributes to their shorter life expectancy.

In Kansas City, government regulators have failed to monitor or enforce environmental standards, and current policies don't adequately address these health disparities, according to a recent report from the regional nonprofit CleanAirNow (CAN) and the Union of Concerned Scientists. In the analysis, CAN and UCS call on regulators to listen to communities like Armourdale and involve them in the decisions that have a direct impact on their health.

UCS partner CleanAirNow installed air monitors in Kansas City communities to measure pollution levels in residential areas. The results show that pollution levels are often higher than indicated by federal air monitors that don't capture spikes in air pollution near freight corridors and industrial facilities.

BUILDING COMMUNITY EXPERTISE

Beto Lugo-Martínez, co-executive director of CAN and a co-author of the CAN/UCS report (online at www.ucsusa.org/resources/environmental-racism-heartland), gave a talk at a community center where Ana Ramos, who lives in Armourdale, is a health advocate. Surprised to learn about the shorter life spans for people in her neighborhood, and newly suspicious of the soot accumulating on her car and in her garden from surrounding industrial facilities, she asked question after question of Lugo-Martínez.

He explained that the air in Kansas City neighborhoods contains unhealthy levels of particulate matter (or soot), and that the community could find out exactly how high their levels are by installing air monitors that provide real-time data, through a community-engaged CAN initiative. After the presentation, Ramos joined CAN to share what she'd learned with her friends and neighbors, and to work for environmental justice in her community. For Ramos, it was critical that Lugo-Martínez communicated with her neighbors using understandable terms, in Spanish, and that he listened to their concerns.

In Armourdale, CAN also took steps to put science in the hands of the people, helping bolster community expertise with hard data by setting up ozone and nitrogen oxide monitors in the most affected neighborhoods. The air monitor data clearly illustrated the need for stricter rules: One month's worth of data showed nine days when pollution exceeded the US Environmental Protection Agency (EPA) standards.

THE POWER OF LOCAL CONNECTIONS

Ramos established an air-monitoring network in her neighborhood by recruiting a friend who runs a home-based daycare center to connect with CAN, learn more about the project, and request a monitor—a process she said was quick.

"We're always talking about how to improve our community," Ramos says. "I told her about the monitors and asked if she wanted to have one at her daycare. She said yes, so she'd know the best

Photo: Beto Lugo-Martínez; Map: LandViewer

time of day to take the kids outside to play." This information allows her to reduce the children's exposure on high air pollution days.

Partnerships with community-based organizations and longstanding relationships help connect CAN with "promotoras" and "movilizadoras de comunidad"—local resident "outreachers" who go door-to-door to talk to families and help them understand environmental issues. Like Ramos, these people are important advocates because they share the same lived experience with others in the community, which creates trust.

COMBATING INEQUITABLE HEALTH OUTCOMES

Residents of Kansas City communities including Armourdale that are close to the railyard and its neighboring industries face long-term exposure to dangerous levels of transportation and industrial pollution, including fine particulate matter ($PM_{2.5}$) and black carbon, or ultrafine particulate matter (smaller in size than $PM_{2.5}$), which are produced when fossil fuels are burned. They contribute to climate change, and exposure is associated with respiratory and cardiovascular disease as well as cancer.

The incidence of cancer has risen in many Kansas City communities, CAN environmental health director and local nurse Atenas Mena notes, adding that these residents will continue to experience negative health impacts unless they keep working to ensure their voices are heard.

"It's devastating that the most-affected people are low-income and people of color because we're already affected by so many other problems," Mena says. "Communities want to know how the environment affects their children."

"In our community, many people lack health insurance. Doctors are sending non-residents back to their countries for treatment if they diagnose them with cancer," Ramos said. To which Mena responds, "It's incredible that they're being sent to another country when they have the resources here to care for people. People of color or people who speak a different language receive different care from others."

That's why the data these communities are collecting from local air quality monitors are so important in helping to bring about the changes they need. "Policy change is coming directly from research we collect," Mena explains. "Research shows how it impacts their health. It's unjustifiable to continue down the path we're on. Having access to clean air, water, land—that's a human right." {C}

***Michelle Rama-Poccia** is the bilingual writer and Spanish podcast host at UCS.*

The neighborhood of Armourdale is bounded to the north by Interstate 70 and the Kansas City railway, and to the south by the Kansas River. The community, home to a large-percentage Latino and immigrant population, also contains industrial facilities that release harmful pollutants capable of causing chronic and acute health problems.

I am incredibly proud to lead UCS as the preeminent organization putting science into the hands of the public officials, litigators, investors, and advocates who are holding the fossil fuel industry's feet to the fire.

Speaking Scientific Truth to Polluter Power

(continued from p. 2)

reporting have been at the epicenter of this fight since the beginning, and we are poised to do a lot more.

UCS researchers helped expose polluters' campaign of deception, finding evidence that fossil fuel executives in the 1980s and 1990s knew full well that their products were harming our planet and our health—and that they deliberately deceived the public about this for decades.

UCS climate scientists have been able to attribute specific effects of climate change—inches of sea level rise, degrees of increase in global average temperature, pH changes in ocean water—to specific fossil fuel producers. And our Science Hub for Climate Litigation is helping experts supply the scientific evidence to inform a growing number of legal cases against fossil fuel companies.

I'm also proud of the update we're presenting on this work, which demonstrates impressive progress over the past decade, and the theme of truth-telling that ties this issue—and all of our work at UCS—together. From taking a measured look at the new electric Ford F-150 pickup truck (p. 12) to assessing the Biden-Harris administration's progress on key science issues (p. 14), to myth-busting a common inaccurate belief about wind energy (p. 22), UCS is hard at work clearing obstacles that stand in the way of science and truth.

As always, thank you for your support of science and evidence, and the work that we do. You are the reason why UCS is in such a strong position to speak scientific truth to power. {C}

Johanna Chao Kreilick *is the president of UCS.*

Fossil Fuel Companies on the Defensive

(continued from p. 11)

Two years later, Heede published another analysis that determined that just 20 state- and investor-owned companies accounted for 35 percent of the world's fossil fuel and cement industry carbon dioxide and methane emissions between 1965 and 2017. Of the eight investor-owned corporations on the list, Chevron was the biggest emitter, followed closely by Exxon-Mobil, BP, and Shell. Together they were responsible for more than 10 percent of the emissions.

PUBLIC AWARENESS GROWS

During the La Jolla meeting, the renowned public opinion expert Dan Yankelovich, who died in 2017, explained his theory of a "public learning curve," which involves three distinct phases for such weighty issues as tobacco or climate change. The first is the "consciousness-raising" phase, which can be amplified by media coverage. The second, the "working-through" phase, is marked by the general public's struggle to come to grips with the need for major change. The third and final phase, "thoughtful public judgment," is when advocacy and litigation lead to laws and regulations. Yankelovich stressed that the campaign to hold fossil fuel companies accountable was most likely in the first stage, and warned that it would take years for the public to reach the judgment phase.

Despite the fossil fuel industry's ongoing climate disinformation campaign, public awareness of the reality and seriousness of the climate crisis has clearly deepened since the 2012 meeting. Gallup polls, for instance, have documented changing US public attitudes about the climate crisis, asking the same questions about the issue since the early 2000s. One of the perennial questions asked respondents how much they "personally worry about global warming." In 2012, 55 percent said they worried about it a "great deal" or a "fair amount." By 2021, that number had risen to 65 percent.

Equally encouraging, a 2019 survey conducted by the Yale Program on Climate Change Communication and funded by UCS found that a majority of people in the United States—57 percent—think fossil fuel companies should pay for the damages caused by global warming. That majority held true even for the oil-dependent states of Louisiana and Texas, where residents are on the front lines of environmental racism and toxic pollution associated with oil and gas production.

UCS posted these and similar graphics on Twitter ahead of the fossil fuel industry hearing before Congress in October 2021, to put public pressure on the executives to testify—and to encourage the congressional committee to issue subpoenas if they declined the committee's invitation to appear.

WHAT'S NEXT?

With reports of extreme climate impacts piling up on a daily basis, it is clearer than ever that we are running out of time to get to Yankelovich's "thoughtful public judgment" phase. Fortunately, the Biden-Harris administration has vowed to do all it can to curb carbon emissions, but it is impossible to predict what a gridlocked Congress will do before the fall elections.

In the meantime, more than two dozen climate lawsuits are pending in state courts and the House Oversight and Reform Committee's investigation will continue. At last fall's hearing, oil and gas company executives refused to pledge to stop funding groups that promote climate disinformation or stop spending money on efforts opposing climate action. Will they ever change their tune? Only if scientists, activists, journalists, litigators, investors, elected officials, and the general public continue to expose and challenge their misconduct—just as they did with the tobacco industry. In the meantime, every minute of fossil fuel industry deception and delay exacerbates the climate crisis. {C}

Photo: Day Of Victory Stu/Adobe Stock (p. 20); Graphics: Nick Iannaco/UCS

Too Much Wind? No—We're Just Not Managing It Well

By Joe Daniel

Wind energy is an abundant, clean, reliable, and low-cost source of electricity used around the world. Wind also has the advantage of flexibility: when operators of electricity grids need to balance supply and demand, they can curtail, or turn down, a wind farm's output. Unfortunately, grid operators' habit of curtailing wind power has given rise to a myth that there is an "oversupply" of wind—perpetuating other myths that renewable energy sources are not as practical as burning fossil fuels.

To bust this myth, my team at the Union of Concerned Scientists worked with a consulting firm to investigate how one grid operator in the Southwest handles wind curtailment. We chose the Southwest Power Pool (SPP) because it has the highest level of wind adoption as a percentage of its total energy generated per year. Consequently, if wind oversupply were a concern, SPP would be the most likely grid in the United States to experience it.

Instead, our analysis found no oversupply of wind in the SPP system. Wind input was curtailed for other reasons: compensating for the inflexible operation of coal-fired power plants, and a lack of both sufficient transmission capacity and battery storage.

COAL. Coal is more difficult for grid operators to dial down during periods of low energy demand compared with wind, but it's not impossible. Because operators choose to curtail wind instead of coal, the result is a less competitive, less flexible, less clean grid that ends up hurting both consumers and the environment. In our study, we found the SPP could have saved its customers more than $40 million by curtailing coal instead of wind, while avoiding nearly 1.2 million tons of carbon emissions per year.

TRANSMISSION. The amount of energy produced by wind turbines can sometimes exceed the amount our existing transmission system can carry. Addressing this transmission undersupply by investing in more robust infrastructure would help maximize the amount of wind energy an electricity grid can accommodate.

STORAGE. In most locales today, if supplies of electricity exceed the demand, that energy will be wasted. But with effective battery storage, that energy can be used later, when demand rises.

Wind "oversupply" isn't just a misnomer; misunderstandings about the causes of wind curtailment can prevent effective solutions and provide the false impression that there is (or might ever be) too much wind. If anything, we need all the wind energy we can get—as an integral part of the clean, affordable, reliable electricity grid of the future. As we continue to add more wind resources, grid operators and others must address the shortcomings in the system outlined here. Otherwise, wind curtailment will increase and ultimately hinder the transition to a power system capable of slowing climate change.

Find more details on our analysis at www.ucsusa.org/resources/wind-oversupply-myths. {C}

***Joe Daniel** is a former senior energy analyst and manager of electricity markets with the UCS Climate & Energy Program. Read more from Joe on our blog,* The Equation, *at https://blog.ucsusa.org.*

Photos: Ja-Rei Wang/UCS (Joe Daniel); thomaslerchphoto/Adobe Stock (wind turbines); WaveBreakMediaMicro/Adobe Stock (ad)

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Two Brattle Square
Cambridge, MA 02138-3780

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