Union of Concerned Scientists

Catalyst

Volume 24, Summer 2024

Countdown on US Coastlines

Hospitals, schools, housing face a flooding deadline

Is Hydrogen Power Actually "Green"?

The Gas Industry Is Gaslighting Us

[Union of Concerned Scientists]

Building the Climate Resilience We All Need

By Chitra Kumar

This *Catalyst* issue features the latest example of the Union of Concerned Scientists' distinct blend of science and advocacy: we're using the latest science to sound an alarm about flooding in US coastal communities *and* offering tools and information to help communities prepare.

As our new *Looming Deadlines for Coastal Resilience* analysis shows, rapidly worsening tidal flooding, driven primarily by climate change resulting from our dependence on fossil fuels, is escalating the risks to essential buildings and services that *millions* of people depend on. According to our findings (see p. 8), chronic flooding—two or more times a year—is likely to inundate more than 1,600 critical infrastructure assets such as public housing, hospitals, schools, and power plants along the US coastline by 2050. On our website, you can zoom in to see which facilities near you may be threatened, and get involved by helping to build climate resilience in your community.

After many years at the EPA, I came to UCS to do exactly this kind of science advocacy, which helps emphasize the equity dimensions involved in our climate work. The sad truth is that climate impacts are occurring already. Sea level rise is happening, and those who were "redlined" through federal mortgage laws into low-lying areas are already bearing the brunt of it. As we learned the hard way from extreme weather events like Hurricanes Katrina and Sandy, among the most worrisome aspects of what lies ahead is that climate change is going to make it so much worse for those who can't buy their way out.

That means we have our work cut out for us to consider the many social issues related to climate change, along with the scientific and technological ones. Indeed, it is our social and economic systems that have helped foster corporate decisionmaking and overconsumption patterns that add up to so many of the problems we face today. The need to address environmental and climate justice carries through much of our work at UCS, and I'm proud to be a part of it. I'm also grateful to all of you for your continued support that makes this work possible. It won't be easy but, working together, we really can stay ahead of the challenges that confront us, and build the kind of climate resilience that can benefit us all.

***Chitra Kumar** is managing director of the UCS Climate and Energy Program. Read more from Chitra on our blog,* The Equation*, at https://blog.ucsusa.org.*

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Photos: Drew Angerer/Getty Images (Washington, DC); Tara Rice (Chitra Kumar)

UCS ON THE RECORD . . . AND HAVING AN IMPACT

"We can expect another dangerous hot summer season, with daily records already being broken in parts of Texas and Florida. As we warm the planet, we are going to see climate disasters pile up and compound against each other because of the lack of resilience in our infrastructure and government systems."

***KRISTINA DAHL**, UCS principal climate scientist, quoted in a May 2024* Guardian *story about extreme heat affecting large swaths of the United States*

"This is a reckless ruling, justified in abstract legal language, [intended] to make environmental, safety, and public health protections harder to implement and enforce, leaving millions of people breathing dirtier air, drinking dirtier water, and living and working in more dangerous conditions."

***JENNIFER JONES**, director of the UCS Center for Science and Democracy, in a press statement on the Supreme Court's June decision overruling the "Chevron doctrine." For more on its implications, visit https://act.ucsusa.org/sum24-scotus.*

"One [US nuclear] submarine has seven times the destructive power of all the bombs used in World War II. And we have 12 of those submarines. It's just incalculable the level of destruction we have at our fingertips."

***STEPHEN YOUNG**, senior Washington Representative in the UCS Global Security Program, from his May 2024 appearance on NPR's "On Point"*

"This unanimous decision highlights the urgency of adopting rigorous measures to protect and preserve our marine environments from the adverse effects of climate change. . . . The advisory opinion . . . is a significant step forward in our collective efforts to safeguard the health of our oceans and the future of vulnerable island nations."

***CARLY PHILLIPS**, research scientist in the UCS Climate and Energy Program, in a press statement on the International Tribunal for the Law of the Sea's decision affirming that countries must "take all necessary measures to reduce, prevent and control" human-caused heat-trapping emissions*

"What an incredible launch of the . . . Black in Environment Conference at Howard University. It was cool to see Michael Regan, the first Black man to lead the EPA, in conversation with the leadership of @BlackInEnviron."

***JAYSON M. PORTER** (@RogueChieftain), participant at the conference, which UCS co-sponsored and supported through our Science for Public Good grants program. Administrator Regan kicked off the in-person events by announcing new EPA rules cutting pollution from the power sector (see p. 5). The next round of Science for Public Good grants will launch this fall; see https://act.ucsusa.org/sum24-spgf to apply.*

[IN THIS ISSUE]

A CLEANER FREIGHT SECTOR **WILL IMPROVE THE HEALTH** OF COMMUNITIES NEAR PORTS, RAILYARDS, WAREHOUSES, AND OTHER FREIGHT ROUTES.

Momentum Toward a Zero-Emissions Freight Sector Picks Up Speed

In April, for the first time ever, the White House announced a commitment to a nationwide zero-emissions freight sector. The announcement reflects the Union of Concerned Scientists' work work with the Moving Forward Network (movingforwardnetwork.com), a collection of about 50 organizations working to align transportation goals and make the plight of communities impacted by toxic freight pollution a top priority. Our community partners have been battling for decades for cleaner air and reduced fossil fuel pollution, and the Moving Forward Network's coordinated approach is finally getting policymakers' attention.

UCS has been focusing on the truck part of the freight pollution problem. Heavy-duty trucks play a big role in our economy, but they generate an even bigger share of harmful tailpipe emissions. Heavy-duty vehicles (e.g., buses, delivery trucks, tractor-trailers) are responsible for more than 28 percent of the total global warming emissions from the transportation sector, as well as 45 percent of smog-forming nitrogen oxides and 57 percent of toxic fine particulate matter from all vehicles on the road. With 1,000 or more heavy-duty trucks passing through some communities each day, they disproportionately harm the health of those living nearby.

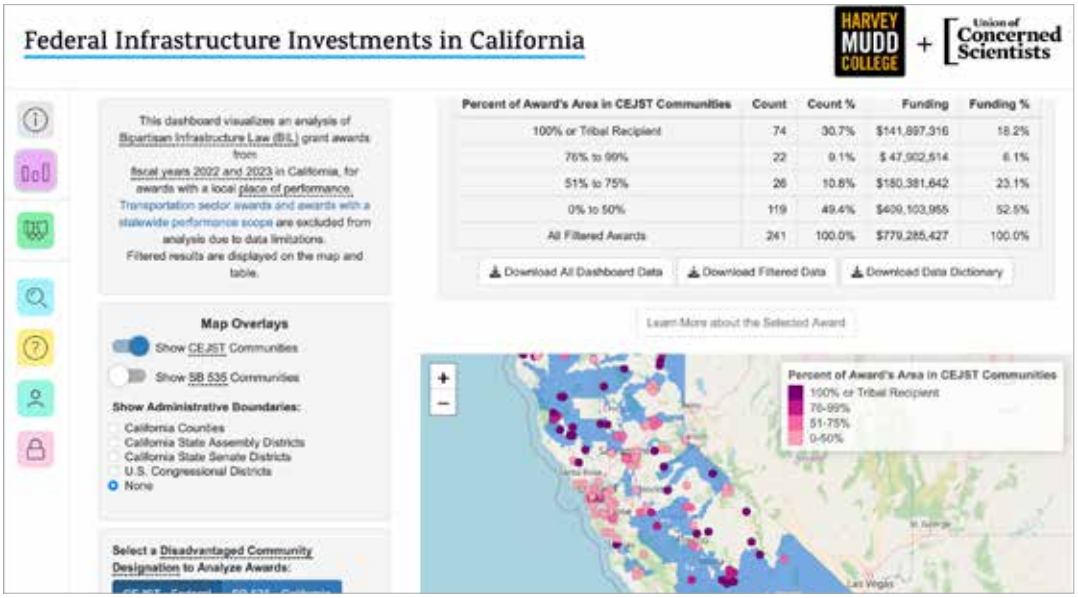
With the White House's new zero-emissions freight commitment, the administration has targeted freight pollution impacting communities near ports, railyards, warehouses, and other freight routes, which have been historically underemphasized. Beyond heavy-duty vehicles and highways, it also covers the rail, warehouse, aviation, and marine sectors. Furthermore, the administration's commitment recognizes the importance of meaningful engagement with community groups that have frontline experience with air pollution from the freight sector.

With more freight moving each year and the challenge of reducing emissions in this sector continuing to grow, the new national commitment represents a huge win for environmental justice organizations, frontline communities, and science-based policy. It also shows the collective power that our movement can wield when so-called green groups collaborate with environmental justice leaders.

Over the past several years, UCS has aligned several of its campaign goals with the Moving Forward Network. We have prioritized community-led actions to drive power towards community solutions, offered technical assistance for MFN's regulatory comments, and supported a network-led petition to the Environmental Protection Agency (EPA) that garnered 10,000 signatures from UCS supporters. We're encouraged to see how this partnership is yielding results. Stay tuned as UCS expands its focus beyond truck pollution, aligning with community priorities to ensure these recent White House commitments come to fruition.

Photo: Drew Angerer/Getty Images

College Students Help UCS Follow the Money



This dashboard, created by UCS and students at Harvey Mudd College, shows how much money reserved for infrastructure projects is—or is not—going to the California communities that need it most.

UCS scientists have teamed up with students from California's Harvey Mudd College to produce a report and online dashboard revealing exactly how many federal dollars reserved for much-needed infrastructure projects are flowing to California's most underserved communities.

The Biden administration has promised to spend more than $850 billion on infrastructure over five years via the 2021 Infrastructure Investment and Jobs Act, also referred to as the Bipartisan Infrastructure Law (BIL). Forty percent of the benefits are supposed to flow to communities that are both historically underserved and overburdened by pollution. But with only three years remaining to invest these billions, how much money is actually reaching the communities that need it most?

The UCS-Harvey Mudd team found that, while California has received the largest investment of any state so far, the administration's environmental justice goals are not being met. Only a quarter of the funding in California is flowing to federally designated disadvantaged communities.

"There are so many unmet needs in California, especially for drinking water projects," says Amanda Fencl, UCS climate scientist and co-author of the report. "California needs about $83.5 billion over the next 20 years to adequately fund drinking water infrastructure. The anticipated funding from BIL—$850 million—represents a fraction of what is needed."

The UCS-Harvey Mudd project not only created a model that can be used for similar studies in other areas of the country, it also left a lasting impression on the students and faculty members involved. Juliet Christian-Smith, western states regional director at UCS, says the students' faculty sponsor called it "the smoothest and most effective clinic project they have been a part of, and they are grateful for the mentorship opportunities it created."

New Power Plant Standards Will Cut Emissions, Protect Public Health

UCS Climate and Energy Managing Director Chitra Kumar and EPA Administrator Michael Regan in Washington, DC, at an event announcing the agency's newest rules regulating pollution from power plants.

Photo: Chitra Kumar/UCS

The EPA announced new rules in May that will cut heat-trapping emissions and reduce pollution from the power sector, measures UCS has long advocated for. The rules cover air and water pollution from coal-fired power plants, the storage of coal ash, and carbon dioxide emissions from coal-fired and new gas-fired power plants.

"Communities located near fossil fuel power plants, coal ash disposal sites, or along waterways polluted by toxic waste from coal plants have been forced to bear the heavy costs of ongoing fossil fuel use—costs that are too often inequitably borne," says UCS Climate and Energy Program Managing Director Chitra Kumar. "With rigorous implementation and enforcement, these new EPA safeguards can provide essential protections for these communities and cut climate-harming emissions."

EPA Sets Limits on "Forever Chemicals" in Drinking Water

This spring, the EPA set the first-ever enforceable federal limits on chemicals referred to by the umbrella term PFAS (per- and poly-fluoroalkyl substances) in drinking water. The new rules will require water utilities to test for and treat certain PFAS in tap water. Along with this rule, the EPA announced $1 billion in new funding for communities to test and treat their drinking water.

Exposure to PFAS is harmful to our health, and known to increase the risk of cancer, weaken immune systems, and disrupt children's cognitive development. Unfortunately, these chemicals—known as "forever chemicals" because of how long they take to break down in the environment—are used in hundreds of products including raincoats, nonstick cookware, carpeting, paint, and firefighting foam. A PFAS-treated product such as a stain-resistant carpet, for example, creates pollution from its manufacturing, use, and eventual disposal, potentially contaminating the air, water, and soil.

UCS has pushed to regulate PFAS in drinking water for years. In 2018, we analyzed PFAS contamination of the groundwater and drinking water at more than 100 US military sites, and exposed the Trump administration's efforts to suppress a federal study showing the adverse health effects from this class of chemicals. In 2019, we conducted an analysis that showed for the first time in the scientific literature that PFAS has disproportionate effects on underserved communities: nearly 40,000 more low-income households and approximately 300,000 more people of color were living within five miles of a site contaminated with PFAS than would have been expected based on US census data. And last year, a lawsuit filed by Earthjustice on behalf of UCS and several other organizations successfully pushed the EPA to set a new rule requiring US industrial facilities to disclose PFAS releases in the agency's Toxics Release Inventory.

The EPA's new drinking water rules give public water agencies five years to reduce PFAS in their water, should levels test higher than allowed. "These rules are based on the overwhelming scientific evidence that PFAS contamination is widespread and poses real risks to people exposed to it, especially infants and children," says Jennifer Jones, director of the Center for Science and Democracy at UCS. "This is an overdue but vital effort to help keep the water we drink safe."

Jones emphasizes that enforcement of these new rules will be key, especially in the face of chemical industry pushback and disinformation campaigns. "There's more work to be done," she says, to protect people from PFAS, including expanding which particular chemicals are included in the EPA's new rules, and issuing additional rules that cover the entire class of PFAS chemicals.

Visit https://act.ucsusa.org/sum24-pfas to read about our efforts to raise the alarm on PFAS and push for strong regulations.

Photo: TaPhotograph/Getty Images

Tyson Foods Water Pollution Analysis Makes a Splash

Since April, when UCS released its analysis *Waste Deep: How Tyson Foods Pollutes US Waterways and Which States Bear the Brunt* in partnership with a reporting team at the *Guardian*, many US news outlets have covered our findings. The report (online at https://act.ucsusa.org/sum24-waste-deep) used publicly available data to estimate that Tyson—one of the world's largest meat and poultry processors—dumped more than 371 million pounds of pollutants from 41 processing plants directly into US waterways between 2018 and 2022. More than half the pollutants were released into waterways in just three states—Illinois, Missouri, and Nebraska—and many of the offending plants are located near low-income communities or near federally defined critical habitats for endangered or threatened species.

These findings were shared extensively by local commercial radio and TV stations; on public radio in Philadelphia, St. Louis, and elsewhere; by newspapers including the *Milwaukee Journal Sentinel* and Tyson's hometown paper, the *Arkansas Democrat-Gazette*; on *PBS NewsHour*; and by the newsroom Investigate Midwest. As a result of this extensive coverage, multiple attorneys pursuing litigation against Tyson have contacted UCS for further information and, within a week of the report's release, the findings had been incorporated into the company's Wikipedia entry.

Justice Department Asked to Investigate Big Oil

This spring, Senator Sheldon Whitehouse of Rhode Island and Representative Jamie Raskin of Maryland released a joint report detailing the findings of Congress's investigation into the decades-long climate disinformation campaign waged by major fossil fuel companies. In an important step, they also formally referred the matter to the US Department of Justice (DOJ), calling on Attorney General Merrick Garland to determine whether the companies engaged in unlawful activities.

These developments follow many years of work by UCS to expose fossil fuel disinformation and hold companies accountable. Whitehouse and Raskin's letter to Garland echoed the findings of UCS's 2007 report *Smoke, Mirrors, and Hot Air*, which documented the precedents behind ExxonMobil's disinformation campaign: "Our investigation into the fossil fuel industry calls to mind the historic congressional investigation into deceptive practices of the tobacco industry."

Whitehouse and Raskin also quoted Sharon Eubanks, who served as lead counsel for the DOJ in its successful civil action against the tobacco industry in the 1990s. That effort famously led to a 2006 federal court ruling that the industry violated civil racketeering laws. Speaking at a Senate budget hearing on the matter in May, Eubanks testified, "The similarities between the conduct of the tobacco industry and the petroleum industry form a solid and appropriate basis" for DOJ action.

UCS Experts Present at Annual GreenLatinos Summit

About 80 people attended a bilingual presentation on climate and energy impacts at this year's GreenLatinos conference in Puerto Rico. UCS participants included Senior Bilingual Energy Analyst and Energy Justice Lead Paula García (far left), Energy Analyst María Fernanda Chávez (third from left), Senior Vehicles Engineer María Cecilia Pinto de Moura (second from right), and Bilingual Senior Social Scientist for Climate Vulnerability Juan Declet-Barreto (far right). "People felt glad that UCS had a strong presence there," said García, "because our organization's reach and influence can help lift up the voices of advocates doing really great work."

Photo: The Toidi/Adobe Stock (Tyson); Verónica López Gamboa/UCS (GreenLatinos)

ON BORROWED TIME

New UCS analysis finds that coastal communities face a sea level rise countdown, with a disturbing number of critical infrastructure assets at risk of frequent flooding.

BY MICHELLE RAMA-POCCIA

Under a blue sky with a cloud streaking across the horizon, a father and child sit on a bench by the harbor eating ice cream. The scene is typical for a mild March Sunday afternoon except for one thing: the bench they're sitting on is standing in several inches of seawater—a tiny island.

There's no way to tell that the road and walkway stretching beside them are also underwater, although the railing poking out from the ocean and the painted white lines quivering beneath waves on the parking lot asphalt hint that something is amiss. Seawater extends across the street, lapping against the brick ice cream parlor as everyone goes about their business.

It's not a scene from a Fellini movie, but one happening now in many US coastal communities. And according to the new Union of Concerned Scientists study *Looming Deadlines for Coastal Resilience: Rising Seas, Disruptive Tides, and Risks to Coastal Infrastructure*, soon it won't only be recreational structures like benches and harbor walks at risk of increasingly frequent inundation. Our analysis shows sea level rise will put more than 1,600 critical infrastructure assets along US coasts—such as schools, public housing, fire stations, and wastewater treatment plants—at risk of disruptive flooding two or more times a year over the next 25 years. (An interactive map showing these locations accompanies our report; visit https://act.ucsusa.org/sum24-looming-deadlines to learn more.)

"What really hit home for me about the report results is just how massive a problem this is going to be," says Kristina Dahl, principal climate scientist at UCS and lead author of the report. "If you think about a single construction project in your city or neighborhood and how long it takes from conception to completion—it's years. So, to think of the 1,600 pieces of critical infrastructure that will have to go through some kind of upgrade or redesign because of sea level rise, it's staggering."


ANTIQUES
ANTIQUES

The amount of infrastructure at risk late this century depends heavily on the choices the United States and other nations make to curb their heat-trapping emissions. But, no matter what, the science is telling us loudly and clearly that public and private decisionmakers alike need to take immediate steps to safeguard critical infrastructure while blazing a path toward true, long-term climate resilience.

PEOPLE OF COLOR ON THE FRONT LINES

As is true with many harmful climate impacts, communities that have experienced historical and ongoing racism, discrimination, and pollution will bear this burden disproportionately. Communities designated as "disadvantaged" by a new federal tool are home to more than twice as many at-risk structures per capita as other communities.

The hardest-hit communities in the 2030 time frame under a "medium" scenario of sea level rise include Atlantic City, New Jersey, with 44 public and affordable housing facilities at risk of flooding twice annually by 2030, a disruptive and costly prospect. Southern Louisiana is also expected to be heavily affected. In Raceland, Lafourche Parish—which has a population of more than 11,000 people—16 public housing buildings, an electrical substation, and a sheriff's office are all in danger of flooding twice annually by the end of this decade.

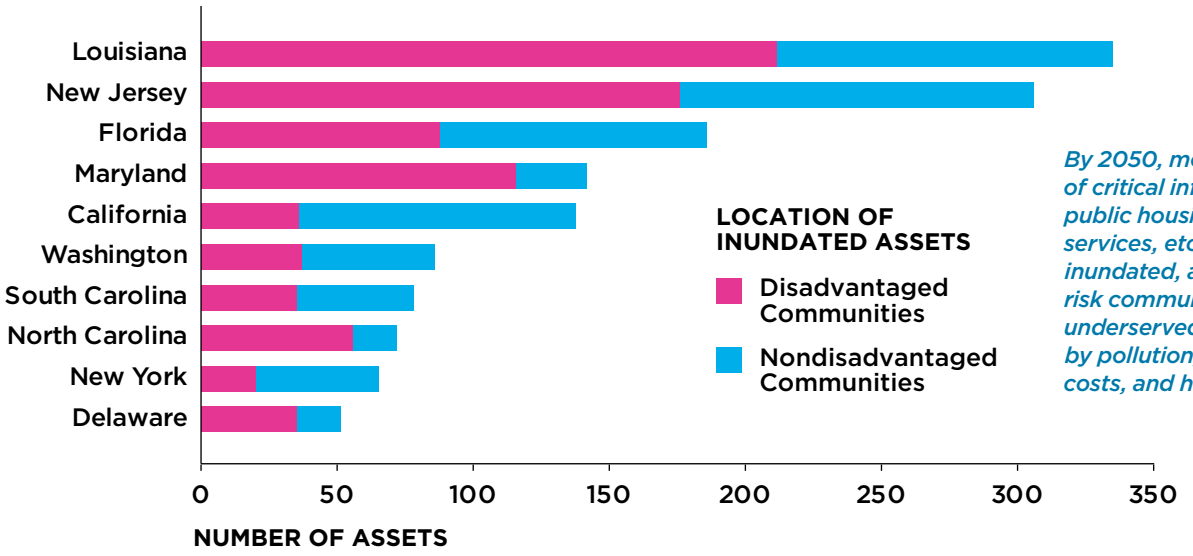
A number of low-income communities of color at risk are in Puerto Rico. "I was astounded at the risks—particularly to public housing—that the San Juan area is facing near the end of the century," says report co-author Juan Declet-Barreto, bilingual senior social scientist for climate vulnerability at UCS. "These results underscore serious inequities. When you compare the risks low-income communities in San Juan are facing with those facing wealthier areas of the city, you can see where sea level rise impacts are going to deepen existing inequities." Facing particular risk is Luis Lloréns Torres, the largest public housing project in the United States, which is surrounded by areas that have been gentrified following Hurricane Maria in 2017.

In the 2050 time frame, the analysis shows that out of all coastal states and territories, Puerto Rico has the largest fraction of at-risk infrastructure in disadvantaged communities, followed by Mississippi. These communities are already underserved and overburdened by pollution, energy costs, health problems, housing costs, and other stressors. Louisiana, New Jersey, Florida, Maryland, and California, in order, contain the greatest total number of assets at risk in this time frame.

One UCS partner, the organization Taller Salud in Puerto Rico, is communicating the study's findings to at-risk communities with a sense of urgency, given the high stakes for their well-being. The group also cites the threat of saltwater contamination

(continued on p. 20)

DISRUPTIVE FLOODING DISPROPORTIONATELY AFFECTS DISADVANTAGED COMMUNITIES



By 2050, more than 1,600 pieces of critical infrastructure—schools, public housing, emergency services, etc.—will be chronically inundated, and many of the at-risk communities are already underserved and overburdened by pollution, housing and energy costs, and health problems.

Photos: Jsnewtonian/Adobe Stock (p. 8); Bill Cotter/UCS (p. 11); chart: Tyler Kemp-Benedict

Solutions Are Out There—Ask These Schoolkids

One group that's not sitting by and waiting for rising seas without thinking of solutions is the fifth graders at Laurel Dell Elementary School in San Rafael, California.

To raise awareness of this threat, UCS Principal Climate Scientist Kristina Dahl collaborated with the University of California, Berkeley; Dominican University; and Youth in Arts on a project in which the fifth graders would work with local high school students to create 3D models that would answer the question: "How can we reduce the environmental impacts of climate change and sea level rise, while creating a more resilient San Rafael—and why is it important?"

The resulting models included floating homes with wind turbines and solar panels alongside soccer fields and indoor swimming pools. The students also created posters with recommendations for community preparedness and strategies for addressing climate change and sea level rise that were featured at various events held at the school.

While it was a fun project, there is much at stake for the kids involved. Their model town featured areas marked in blue that are projected to be underwater in the future due to coastal flooding, and many of the students' homes are located in and around those blue zones.

Located just north of San Francisco in Marin County, San Rafael is a tale of two cities: the Canal area, which is actually below sea level, has a majority Hispanic or Latino population and a median income lower than the surrounding hills, which have a wealthier, whiter population insulated from the direct effects of sea level rise.

Families often turn to the Canal area to find rental properties because it is more affordable. But the area was developed before there were flood or even seismic regulations, meaning its homes and infrastructure are vulnerable to what is coming.

"We know that there is a risk there and it is quite high," says Cris Criollo, Environmental Justice Specialist for the Sea Level Rise Collaborative Project in San Rafael with the Multicultural Center of Marin. "By 2050, sea level is projected to rise by 25 to 30 centimeters [about 10 to 12 inches]."

Criollo and her group work to inform community members living in the coastal areas of the city about how sea level rise may affect them and about the root causes of climate change. "The evidence is the water in the streets," she says. Sea level rise is already making certain streets in the neighborhood impassable during astronomical high tides and storm surges.

In addition to a study her organization is conducting with several other groups examining water levels and potential adaptation measures for the area, they are involving the community in citizen science using simple tools to collect data about flooding. "When the community supports data collection, it becomes theirs and that ownership makes them continue to participate and want more information," Criollo says. "We're looking for allies outside the Canal as well. We want them to understand what is happening and be sensitized to these problems that a neighboring community is going through."

California's Ambitious Clean Energy Goals Remain in Sight

INTERVIEW WITH MARK SPECHT AND VIVIAN YANG

Two UCS energy experts weigh in on a California law that represents a model for how the rest of the country can move to a clean energy economy.

In 2018, California passed SB100, landmark legislation with the ambitious goal of achieving 100 percent clean energy by 2045. Six years later, is the state on track to meet that deadline?

VIVIAN YANG: State analyses have shown that achieving the SB100 clean energy goals are possible and it's now an effort in implementation. With a 2045 timeline, California needs to accelerate its clean energy deployment far beyond what has occurred historically. This means quickly addressing the bottlenecks that are preventing a faster transition. In California and across the United States, insufficient transmission capacity, grid interconnection delays, and long permitting times have been notable barriers to getting more clean energy projects online.

California certainly recognizes these issues and has taken promising steps to address them. There has been a lot of momentum in state and federal initiatives recently to improve transmission capacity. Similarly, California's grid operator has undergone major reforms in its interconnection process, which would allow clean energy projects to connect to the grid faster. Permitting often remains a challenge, but efforts for stronger engagement with local, affected communities can make the process smoother while building support for clean energy more broadly.

With the transition to clean energy now under way, what new challenges have emerged for California?

MARK SPECHT: Over the past few years, California has faced significant grid reliability challenges, especially in the face of heat waves and wildfires exacerbated by climate change. Ever since the rolling blackouts in August 2020 and a series of devastating wildfires in the preceding years, California utilities and state officials have been scrambling to address these challenges.

Slowly but surely, the state has been catching up. California utilities, especially PG&E, have made huge investments to reduce the chance of sparking wildfires with their utility infrastructure. And after implementing a public safety power shutoff program that affected millions of Californians in 2019, PG&E has become much better at implementing fewer and more targeted power outages that affect fewer people.

California energy providers have made tremendous progress addressing grid reliability issues. With more than 10 gigawatts of battery storage now on the grid, those batteries are playing a critical role ensuring grid reliability after the sun goes down. As a result of having those batteries, alongside other measures, there have been fewer and fewer grid emergencies over the past couple years.

However, there have also been some disappointing setbacks. For example, in the frenzied efforts to shore up grid reliability, state officials decided to extend the lifetimes of Diablo Canyon [the last remaining nuclear power plant in the state] and multiple, extremely old and polluting fossil gas plants on the coast. And California ratepayers are really starting to feel the financial burden of all this infrastructure investment, with electricity bills rapidly increasing due in large part to investments in wildfire mitigation. This increase in electricity rates and bills is particularly worrisome because it degrades the economic incentive to electrify vehicles and homes.

California has no shortage of challenges to confront, but the state still has time to meet its near-term climate change mitigation goals, and it also has an opportunity to show the rest of the world how to deal with the myriad challenges facing the state while making steady progress on the transition to clean electricity.

The California Public Utilities Commission recently made a decision to ratchet up the amount of emissions reductions expected from the power sector. What happened, and why is this an important development in the state's clean energy trajectory?

MARK SPECHT: This decision was a long time coming. UCS has been advo-

MARK SPECHT is the western states energy manager and **VIVIAN YANG** is the western states energy analyst at the Union of Concerned Scientists. They use research and advocacy to accelerate the transition to clean energy and a less polluting and less carbon-intensive energy system in California and other western states. Read more from them on our blog, *The Equation*, at https://blog.ucsusa.org.

> ***California has an opportunity to show the rest of the world how to deal with the myriad challenges facing the state while making steady progress on the transition to clean electricity.***

cating for years for the California Public Utilities Commission to set a more ambitious emissions reduction target. Earlier this year, the commission finally set the target in line with UCS's recommendation. Now, California electricity providers will need to reduce their emissions from roughly 60 million metric tons in 2021 down to 30 million metric tons by 2030.

This is significant because clean electricity is the bedrock for achieving the state's climate change goals. Having a foundation of clean electricity allows other sectors of the economy, like transportation, to switch from fossil fuels to clean electricity and significantly reduce their global warming emissions.

When you consider the huge changes coming our way via technology, climate impacts, and political uncertainty, what is the public not thinking enough about?

MARK SPECHT: One potential tool that could play a huge role in the clean energy transition is demand-side resources. For example, electric vehicle charging could be timed to coincide with periods of high renewable generation, like the middle of the day when solar panels flood the grid with low-cost energy. Those vehicles then could avoid charging in the evening when demand on the grid is highest. Electric vehicles could even discharge energy back to the grid during periods of very high electricity demand, which could help manage peaks in electricity demand without building lots more grid infrastructure. Harnessing demand-side resources such as electric vehicles could play a huge role in smoothing the transition to clean electricity.

VIVIAN YANG: It's also important to recognize how the transition to clean energy will affect other climate-related issues like land use and water conservation. Clean energy infrastructure requires land, and an increasingly big discussion in California—especially the Central Valley—has been around transitioning agricultural land to clean energy.

The Central Valley is one of the world's most productive agricultural regions, but extractive farming practices have created issues like soil degradation and water scarcity. These are made worse by the climate-induced droughts and heat waves that the state is experiencing. In this context, there are opportunities to support the growth of clean energy while also improving these other resource issues. For example, certain agricultural land will need to be retired under the state's Sustainable Groundwater Management Act—land that could be used for clean energy.

But as energy and agricultural industries have often been harmful to rural communities, low-income communities, and communities of color, it's incredibly important that development of clean energy in these areas is done equitably, with strong considerations for local communities and the environment. Luckily, UCS's experts are involved in this range of agricultural, energy, and water issues in California, allowing for collaborative efforts to advocate for equitable land repurposing. {C}

This interview was edited for length and clarity.

Photo: Kristina Wagner/Unsplash

BEWARE THE HYDROGEN HYPE

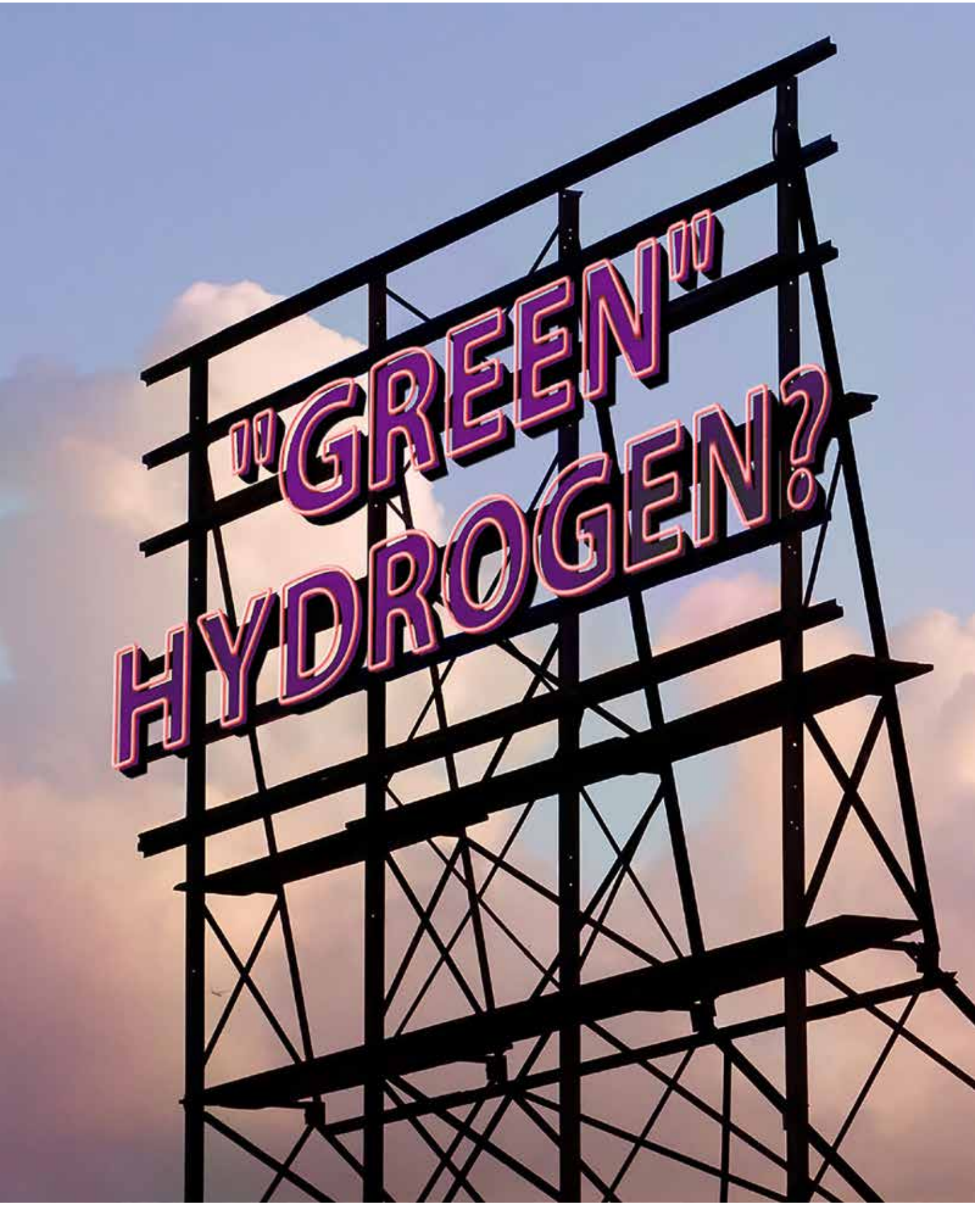
Unless we're vigilant, fossil fuel–friendly hydrogen policies could actually increase *global warming emissions instead of aiding the clean energy transition.*

BY PAMELA WORTH

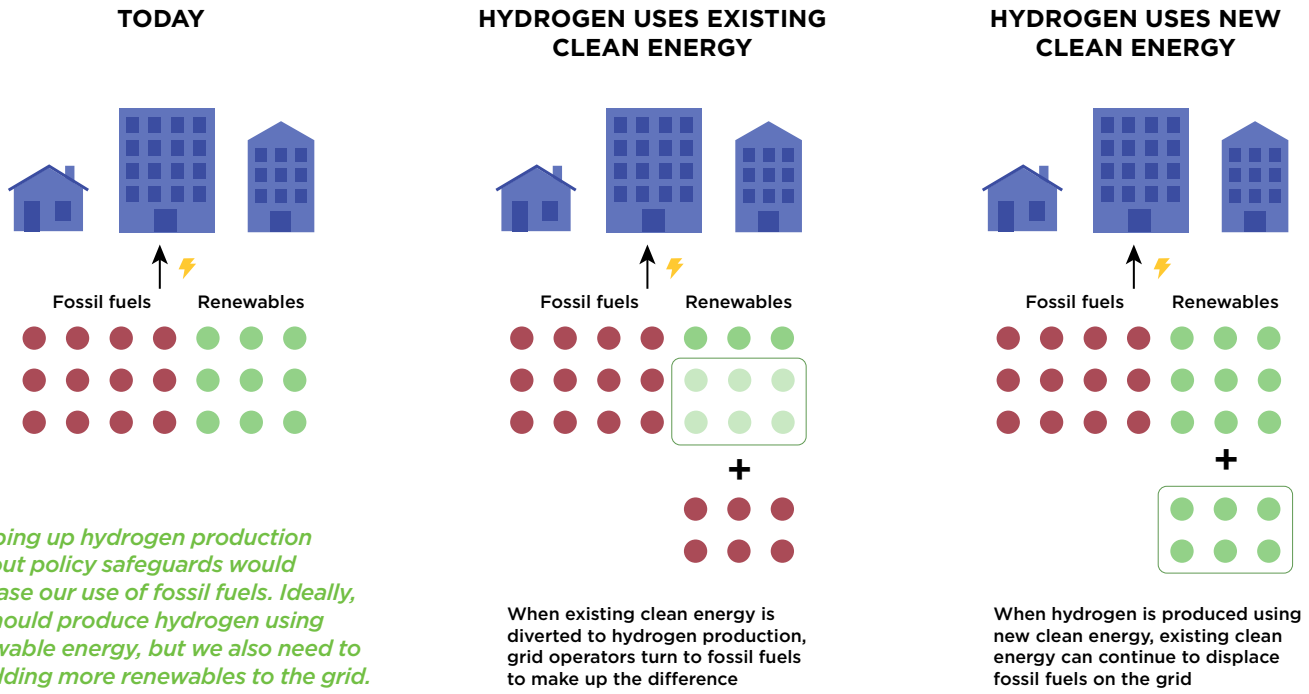
As the United States accelerates its clean energy transition with abundant federal funding from the Bipartisan Infrastructure Law and the Inflation Reduction Act, you may have seen an uptick in headlines like "Clean Hydrogen Market to Witness Huge Growth by 2032" (Allied Market Research) or "The Green Fuel That Even Red America Loves" (*Wall Street Journal*).

It's easy to see why the idea of a clean energy economy powered by hydrogen is attractive. Hydrogen, the universe's most abundant element, emits no heat-trapping gases when used.

But in the real world, as noted by Julie McNamara, deputy policy director for the Climate and Energy Program at the Union of Concerned Scientists, hydrogen's production and use are not so straightforwardly clean or green. And going all in on hydrogen risks slowing progress on implementing proven, currently scalable clean energy technologies such as wind power, solar power, and battery storage to displace fossil fuels—at best. At worst, it could contribute to increased global warming emissions and air pollution, offering a cover for fossil fuel companies to keep on conducting business as usual.


"GREEN"
HYDROGEN?

GOOD AND BAD USES OF CLEAN ENERGY DIVERTED TO HYDROGEN PRODUCTION



Ramping up hydrogen production without policy safeguards would increase our use of fossil fuels. Ideally, we should produce hydrogen using renewable energy, but we also need to be adding more renewables to the grid.

When existing clean energy is diverted to hydrogen production, grid operators turn to fossil fuels to make up the difference

When hydrogen is produced using new clean energy, existing clean energy can continue to displace fossil fuels on the grid

"We're at risk of building out the wrong industry, of valuing the wrong things," says McNamara. "There's a huge gap between what hydrogen *can* do and what we should push for hydrogen *to* do. We can't let it distract us from our primary charge to directly replace fossil fuels with renewable resources." Instead, she says, we should view hydrogen as one tool in a toolbox of varied climate change solutions.

CLEAN, "GREEN" HYDROGEN? NOT YET

For hydrogen to effectively serve as a tool in the clean energy transition, it must be cleanly produced, and it must be carefully targeted to displace fossil fuels in applications that renewable resources cannot directly reach. Neither of these conditions are now met.

Despite its abundance, hydrogen is not readily available in pure form. Most typically, hydrogen is produced from fossil fuels through an emissions-heavy process known as steam methane reforming. In the United States, almost all of this hydrogen is currently used by fossil fuel companies to refine crude oil, or to produce chemicals and fertilizer.

Therefore, says McNamara, "today's fossil-based hydrogen is not a climate change solution in the slightest."

The fossil fuel industry argues that it can "clean up" hydrogen production by capturing the carbon emissions generated in the reforming process and storing them underground. But carbon capture technology remains unproven at scale, requires a significant build-out of additional infrastructure, and fails to curb health-harming pollution. And most critically, this process still depends on fossil fuels, meaning continued upstream methane pollution and all the harms fossil fuel extraction brings with it.

A ROLE FOR HYDROGEN—WITH CAVEATS

Hydrogen can be produced without carbon emissions through a process called electrolysis: splitting water into hydrogen and oxygen. Running an electrolyzer on today's electricity grid (which is still heavily dependent on fossil fuels) would result in hydrogen with a carbon intensity more than twice as high as steam methane reforming. However, if this process is powered by renewable energy, it can create so-called green hydrogen. This can be a valuable way to extend the reach of renewable energy resources for end uses that can't be directly electrified, such as steel production, maritime shipping, and long-haul aviation.

Unfortunately, green hydrogen is not a silver bullet. Even if an electrolyzer were powered only by renewable energy, because it requires copious amounts of energy to make hydrogen, right now those renewable resources would be far more effectively used to directly displace fossil fuels. "At this point," says McNamara, "ramping up green hydrogen production too much and too fast risks prolonging our reliance on coal- and gas-fired power plants."

On the end-use side, regardless of how hydrogen is produced, if it's burned instead of run through a fuel cell, it can generate nitrogen oxide emissions—potent air pollutants—that would be commensurate with those of fossil gas combustion, or even worse. That means while hydrogen could address the climate

(continued on p. 21)

Photos: Generative AI Composite by UCS/PhotoFunia (p. 14); Karen Buesing (profile); moodboard/Adobe Stock (ad); Illustration: Nick Davis-Iannaco/UCS

In a Battle of Experts, He Bets on UCS

Bob Buesing's support for the Union of Concerned Scientists has spanned nearly 50 years and his entire legal career. As a student, he was inspired by a seminar on the groundbreaking fight to ban the insecticide DDT, led and won by scientists and advocates who presented evidence of its dangers in bird populations. Knowing that UCS employs the same caliber of engaged experts to make policy changes, he began donating when he was in law school.

"That first of 50 annual gifts I made was out of a starving student's budget," he says. "But I'd learned that only through well-researched and thoroughly tested science can we expect to advance and protect our future. So, even though I didn't have a lot of money, it was important to me."

Now retired, Bob is no longer living on a student's budget, and has been fortunate to accumulate savings in an Individual Retirement Account (IRA). When he learned about the Qualified Charitable Distribution (QCD) that allows those over 70½ years old to donate pre-tax dollars to nonprofit organizations directly from an IRA—which can reduce required minimum distributions—he thought of

UCS, and what he describes as "the power of the scientific method to build powerful and irrefutable arguments for change."

Bob took advantage of the QCD to donate to UCS tax-free. It's both immediately satisfying, he says, and complements the legacy gift set aside for UCS in his estate plans, which will ensure the organization's work continues.

"It's time to get off the sidelines and put that saved money to work," he says. "The global climate change crisis urgently requires not one but hundreds, or even thousands, of incremental improvements. I trust UCS's ability to spot those solutions and build compelling cases with regulators and the public to put them into practice."

WHERE SCIENCE AND THE LAW OVERLAP

Throughout his career, Bob watched as efforts to protect public health and the environment transformed from popular movements into the realm of public policy. His legal career gave him an appreciation for UCS scientists who can navigate the complexities of these policies and regulations to make positive change. Having seen how labyrinthine these processes can be, he says, "only reinforced my commitment to support the dedicated specialists who share my values, and also understand that complicated world.

"This is not the province of amateurs: only top-notch experts could go toe-to-toe with the forces that ignore the facts in service of shortsighted profit," he says. "All the more reason to support UCS. No one does a better job of doing the science, building the cases, and sounding the alarms.

"I'm blessed with wonderful children and grandchildren. The least I can do for them, and every child everywhere, is invest in the best possible way to make their futures brighter. For me, no organization is more compelling than UCS." {C}

Enough Gaslighting: The Truth about Gas Industry Disinformation

By Elliott Negin

Thanks to news organizations and advocacy groups (including the Union of Concerned Scientists), it's no longer a secret that the US oil industry was aware as early as 1957 that its products threaten the climate. Less known, though, is the fact that the gas utility industry has also been engaged in deceit about this harm as far back as 1970.

Now that there is a desperate need to slash global warming emissions worldwide, it's critical to rapidly phase out the use of all fossil fuels. That includes fossil gas, which consists of 85 to 90 percent methane—a significantly more potent heat-trapping gas than carbon dioxide. A 2023 study concluded that as little as 0.2 percent of methane leaking from the gas production and delivery system would make gas just as bad as coal for the climate—and the actual amount of leakage is worse than that. The EPA estimates that about 6.5 million metric tons of methane leak from the oil and gas supply chain each year—approximately 1 percent of total gas production (*five times more* than the 0.2 percent threshold).

Public health is at risk, too. Gas stoves, used in 38 percent of US households, not only emit methane but also nitrogen dioxide (NO_2) and other toxic pollutants associated with respiratory ailments and cancer. A 2022 study detected more than 20 volatile organic compounds including hexane, toluene, and benzene in unburned stove gas.

Despite mountains of data, though, the American Gas Association (AGA)—the leading industry trade group that represents more than 200 investor-owned gas utility companies and their suppliers—contends there is no problem. Among other claims, the AGA maintains that gas stoves are a "minor source" of NO_2 and dismisses the scientific evidence showing that they contribute to asthma and other respiratory illnesses.

FOLLOWING THE DISINFORMATION PLAYBOOK

The gas utility industry, which won over the public with its "cooking with gas" advertising campaign in the 1930s, found itself at a crossroads in the late 1960s when sales of electric ranges outpaced gas stoves for the first time. In 1969, the AGA launched a million-dollar advertising campaign (equivalent to $8.45 million today) to try to recapture the market, which it saw as critical because homeowners with a gas stove are more likely to buy other big-ticket gas appliances—a furnace, a water heater, a clothes dryer—that use a lot more gas than a stove.

Since then, the gas industry—much like Big Oil—has cribbed heavily from the tobacco industry's playbook. Below are some of its main tactics, many of which are detailed in an October 2023 report by the Climate Investigations Center, a nonprofit watchdog organization:

Attacking credible science. Since the 1970s, the gas industry has commissioned epidemiological studies that find no association between gas stove emissions and respiratory illness. Many of the authors of these studies failed to disclose their funding sources, but the private labs and companies behind the work, such as Battelle Laboratories and the Arthur D. Little consulting firm, had previously done contract work for the tobacco industry to dispute the link between smoking and disease. This tactic continues today. Just last year, the AGA contracted with Gradient Corporation—a scientific consulting firm with a history of downplaying health threats on behalf of its industry clients—to examine past studies that investigated the connection between gas stoves and respiratory problems. Gradient predictably found that the voluminous evidence presented in previous studies was "inconclusive."

Photos: bm_photo/Adobe Stock (p. 18); American Gas Association, Inc. (vintage ad)

The gas industry has advertised directly to consumers for decades, evolving from print (left) to social media (right). One Instagram influencer's post promoting gas stoves (top) was sponsored by the AGA.

Running misleading public relations campaigns. In recent years, the gas utility industry has embraced social media to portray itself in a positive light. Since May 2018, for example, the AGA has spent more than $113,000 on 440 Facebook and Instagram ads that minimize the threat gas poses to the climate and public health. The Consumer Energy Alliance, whose 350 members include the AGA and 78 other fossil fuel producers, suppliers, and trade associations, has spent more than $700,000 for an additional 2,300 Facebook and Instagram ads over the same time period. Gas utilities have likewise launched their own social media campaigns. One spot on TikTok, for example, featured an influencer in her kitchen parroting gas industry talking points while cooking on a gas stovetop and singing the praises of her gas clothes dryer and fireplace. The spot did not disclose who paid for it, but the influencer's Instagram profile includes a link to the Southwest Gas website.

Hiding behind front groups. Some local governments across the country have responded to the climate crisis by changing building codes to ban gas hookups in new homes and buildings. In response, gas utilities in more than a dozen states have set up front groups such as Californians for Balanced Energy Solutions and Coloradans for Energy Access that appear independent even though they are paid by the industry to promote gas as "clean, reliable and affordable," to denigrate renewable energy, and to oppose gas bans and other climate solutions. According to the Energy and Policy Institute, since May 2018, 15 of these front groups have spent $3.6 million on more than 14,000 Facebook and Instagram ads. The top spender, a front group founded in 2020 with a war chest of more than $10 million called Natural Allies for a Clean Energy Future, spent more than $1 million for some 2,000 ads.

So far, these disinformation tactics have proven all too successful. Gas utility lobbyists have persuaded legislators in at least 24 states to pass laws blocking cities and counties from banning or restricting new gas hookups. Worse yet, the federal government, which has known of their hazards at least since the 1970s, has yet to set a stringent standard for gas stove emissions.

Enough gaslighting. It's time to expose the truth about the industry's deceptive tactics and the dangers of fossil gas to our health and to the planet, so we can move to a clean energy economy as quickly as possible. {C}

***Elliott Negin** is a former senior writer at UCS.*

On Borrowed Time

(continued from p. 10)

to underground drinking water supplies (a risk the study did not examine), which they fear could cause or compound problems even before rising oceans flood aboveground infrastructure and homes.

In addition to Puerto Rico, *Looming Deadlines*—which builds upon UCS's 2018 report *Underwater* that focused on risks to coastal homes—includes data on Guam and the US Virgin Islands.

THE ENCROACHING TIDE LINE

"One thing I think goes unnoticed about our coastal risk is that we have so much infrastructure, so much of the nation, clustered on the coast," says report co-author Erika Spanger, UCS director of strategic climate analytics. "We built right up to the coast because we thought we knew where the high tide line was. Now, those assumptions are out the window."

We need the latest science to tell us where the tide will be two and 10 years from now, she adds. The threat of inundation can go completely unnoticed until it causes significant (and expensive) disruption.

In total, of the critical infrastructure at risk in the next six years under a medium sea level rise scenario, 717 structures would be inundated monthly—a 17 percent jump from 2020. The communities with infrastructure at risk in 2030 are currently home to *nearly 2.2 million people*.

Fast-forward to 2100: even under a "low" sea level rise scenario in which nations reduce their global warming emissions, nearly 3,500 critical infrastructure assets are expected to flood twice annually. The challenges this will pose to communities around the country are difficult enough to imagine but, under a "high" sea level rise scenario, the number of critical infrastructure assets at risk could be as high as 15,000. That could severely hamper essential community services and expose residents to harmful pollutants.

"We need to focus on deadlines to see this risk coming and make the necessary investments and changes to avoid costs and impacts," Spanger says.

SOLUTIONS AND ACCOUNTABILITY

The most important thing we can do to limit risks from sea level rise is to stop burning fossil fuels that emit carbon dioxide and other heat-trapping gases. We must also implement science-based policies that protect people, ecosystems, and the economy.

Still, because of past emissions, some degree of worsening coastal flooding is inevitable. The risks to vital infrastructure and services that millions of people depend on will grow as the global sea level rises over the coming decades. This will have massive implications for public health, safety, education, well-being, and for coastal ecosystems and ways of life. That's why policymakers and public and private decisionmakers need to take protective action now, working closely with communities to safeguard critical infrastructure.

The next 10 years offer a crucial window to build resilience by climate- and flood-proofing coastal infrastructure with resources made available through the Inflation Reduction Act, the Bipartisan Infrastructure Law, and funding from Federal Emergency Management Agency and Department of Housing and Urban Development programs, among others. These funds must be made readily and equitably accessible to the disadvantaged communities that will be the hardest hit.

> ***We have so much of the nation clustered on the coast. We built close to the water because we thought we knew where the high tide line was. Now, those assumptions are out the window.***

Photos: Joe Raedle/Getty Images (school buses); Scott Olson/Getty Images (industrial flooding)

US infrastructure has long been underfunded, and sea level rise exposes and exacerbates the resulting vulnerabilities, so both public and private investments in infrastructure resilience are critical. Taxes, fees, utility rates, municipal bonds, and loans will all likely need to play a role, given the scale of the challenge our coasts are facing. Another potential source of funding is the creation of a national resilient infrastructure bank.

In addition, fossil fuel companies must be held accountable for their contributions to the climate crisis and should pay their fair share to communities for the damage their products have caused. Litigation against fossil fuel companies could provide additional revenue for funding climate resilience by holding the companies responsible for lying to the public for decades and using their influence to block needed government action.

Science and innovation will be integral to planning for sea level rise and climate resilience at the community level, where beneficial land zoning and protections for natural flood mitigation assets such as wetlands could reduce risks.

"The choices we make in this decisive decade will have a profound impact on whether communities will be better protected and prepared—or whether they will face rapidly accelerating costs and harms from flooding," says UCS Climate and Energy Policy Director Rachel Cleetus. "The acute exposure of public housing to flooding must be urgently addressed, or else it will compound the ongoing affordable-housing crisis. Policymakers and decision-makers at all levels must stop enabling risky business-as-usual practices and instead ramp up transformative and equitably shared investments in climate resilience and clean energy." {C}

Michelle Rama-Poccia *is a bilingual writer at UCS, and the host of our Spanish-language podcast* Ciencia Consciente. *Hear more from Michelle at https://act.ucsusa.org/sum24-podcast.*

Beware the Hydrogen Hype

(continued from p. 16)

side of the clean energy transition, without accompanying pollution control requirements it could still perpetuate harm to public health.

UNINTENDED CONSEQUENCES

Several new federal policies intended to spur increased hydrogen production and use are in development—and it's not yet clear they will have the necessary safeguards to ensure that hydrogen emerges as a true clean energy solution. Instead, loopholes in these policies risk *raising* global warming emissions by diverting renewable resources from directly displacing fossil fuels, and perpetuating investments in fossil fuel infrastructure.

This, says McNamara, is why the fossil fuel industry and its lobbyists are pushing policymakers to divert more funding to hydrogen. "They don't want to change," she says. "They see that investments in hydrogen can help them maintain their status quo, driving more investments in fossil fuel extraction and fossil fuel infrastructure while kicking the can down the road on clean energy."

Over the past year, McNamara has been weighing in on a proposed tax credit for hydrogen producers to ensure it's implemented without polluter loopholes. "The administration released a strong proposed rule, but the fossil fuel industry is fighting back hard. If they get their way, we could end up with a tax credit that increases overall carbon emissions," she says. "And one that hands out hundreds of billions of dollars over decades to subsidize investments in fossil fuel–friendly projects that are fundamentally misaligned with the needs of the clean energy transition." At the time this article was written, the US Treasury Department (which is issuing the implementation requirements for this particular credit) had not provided its final guidance.

In the meantime, UCS is monitoring state-level hydrogen policies and the implementation of so-called hydrogen hubs funded by the 2021 Bipartisan Infrastructure Law. "We can't let industry be the only voice weighing in on these policies," says McNamara. "There's too much at stake."

For more information on our efforts to ensure clean energy investments stay focused on our foremost priorities—renewable energy and storage—visit https://act.ucsusa.org/sum24-hydrogen. {C}

Pamela Worth *is senior writing manager at UCS.*

How Big Corporations Shape Food and Farm Policy

By Omanjana Goswami and Karen Perry Stillerman

Which industries would you guess spend a lot of money on lobbying? Defense contractors, perhaps? Or the oil and gas sector? Those industries spend lavishly to influence policy—but you might be surprised to learn that Big Agriculture regularly outspends each of them. As we detail in our new UCS analysis, *Cultivating Control*, lobbying on federal legislation including the food and farm bill surpassed *half* a *billion dollars* between 2019 and 2023.

Our research looked at the activities of 561 corporations, industry associations, and other interest or advocacy groups. The time period we examined covers the term of the most recent food and farm bill—a trillion-dollar piece of legislation that heavily influences what we eat and how farmers operate. That bill, which is typically revised every five years, was supposed to be passed in 2023 but was still being debated when this article was written. It is probably no coincidence that lobbying spiked in 2023, as the pressure to shape the next five years of US food policy peaked. Big Ag lobbying that year accounted for more than half of the $523 million five-year total.

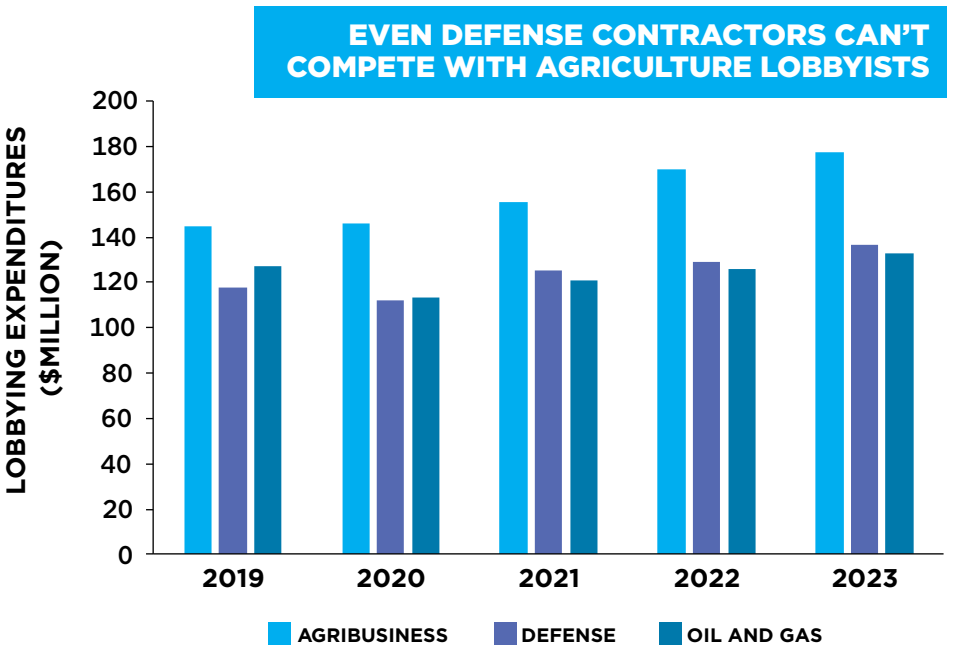
A PAY-TO-PLAY SYSTEM

Our analysis (online at https://act.ucsusa.org/sum24-cultivating-control) shows that these powerful interests are pushing agriculture on a path that is not good for the rest of us. Consider one of the top spenders: the American Farm Bureau Federation, which is composed of state organizations that sell insurance to both farmers and non-farmers. During the period we studied, the Farm Bureau reported spending $15.7 million to lobby on legislation including the food and farm bill. Federal reporting requirements don't allow us to know exactly what these lobbyists were seeking, but we do know that the Farm Bureau has opposed action on climate change, and that it successfully sought to weaken rules requiring corporations to report their climate emissions. US agriculture contributed 9 percent of the country's total global warming emissions in 2022, but lobbying by the industry has helped it avoid any meaningful regulation.

Making matters worse, our food system continues to be dominated by the overproduction of corn and soybeans and the overapplication of chemicals like nitrogen fertilizer. These chemicals damage soils and run off fields, polluting waterways and creating a "dead zone" in the Gulf of Mexico recently measured to be larger than the state of Delaware. Nevertheless, the Farm Bureau lobbies not just to continue federal subsidies for corn and soybeans, but to *expand* them.

Big Ag lobbyists drown out the voices of small and midsize farming operations, young farmers, and historically marginalized groups including Black and Brown farmers and farmworkers. And the flood of Big Ag money, in effect, turns US agriculture policy into a "pay-to-play" system. What we need is a food and farm bill that helps level the playing field for all farmers and workers. {C}

Omanjana Goswami *is an interdisciplinary scientist in the UCS Food and Environment Program.* ***Karen Perry Stillerman*** *is acting director of the program. Read more from them on our blog,* The Equation*, at https://blog.ucsusa.org.*



Data collected by OpenSecrets shows that lobbying by the US "agribusiness" sector regularly exceeds that of the defense and oil and gas sectors. New UCS analysis finds that lobbying on agriculture in 2023 (including the food and farm bill) was far higher—reaching $318.5 million.

Chart: Heather Tuttle/UCS; Photo: WaveBreakMediaMicro/Adobe Stock

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