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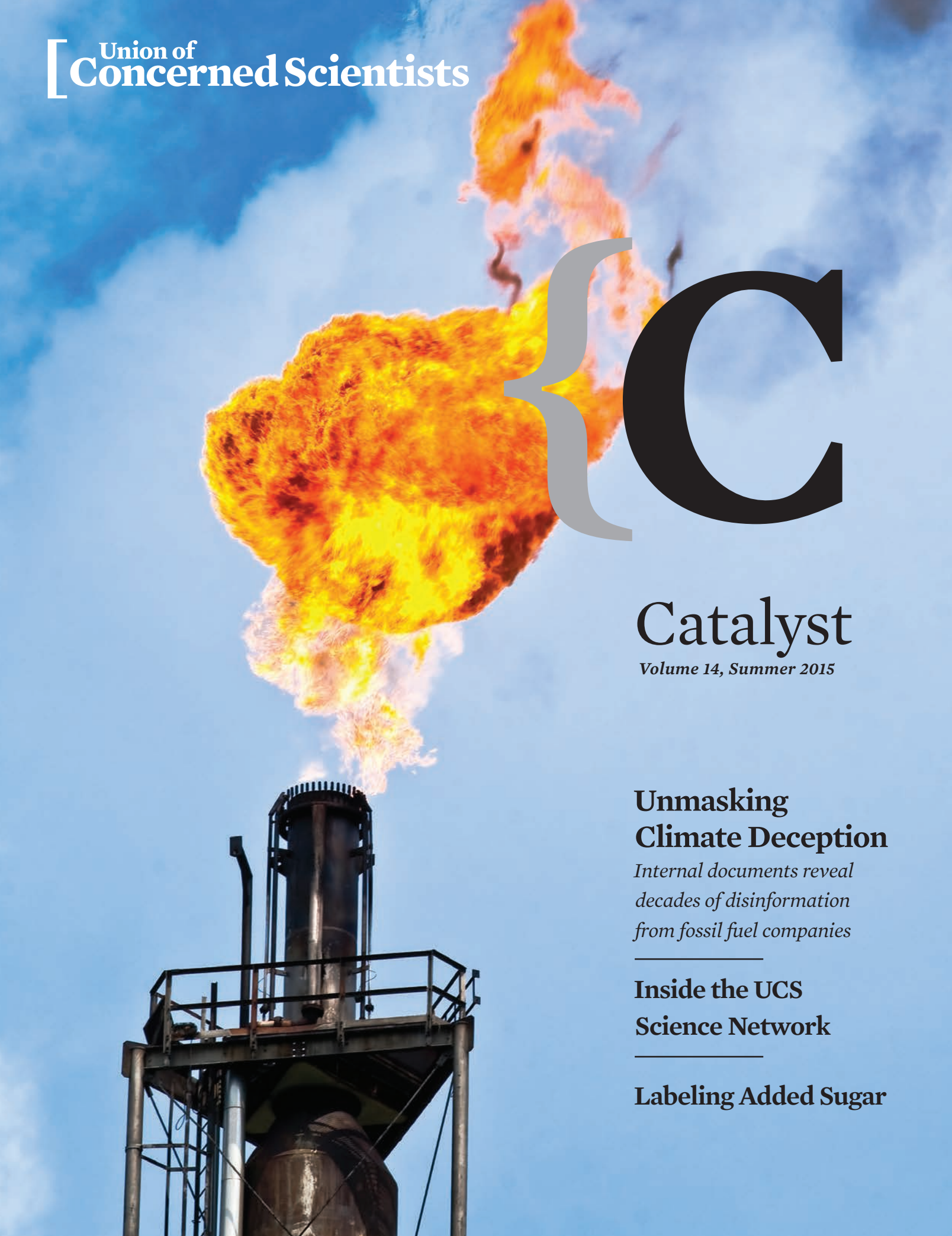

{C Catalyst

Volume 14, Summer 2015

Unmasking Climate Deception

Internal documents reveal decades of disinformation from fossil fuel companies

Inside the UCS Science Network

Labeling Added Sugar

[Union of Concerned Scientists

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Decades of Climate Deception

By Ken Kimmell

For many years, scientists and public health experts warned of smoking's link to lung cancer and heart disease. But only after internal documents surfaced in the course of litigation did Americans come to understand how the tobacco industry had deceived them about the dangers of cigarettes. Among the damning documents leaked to the press was a now-infamous 1969 memo from the Brown and Williamson tobacco company. "Doubt is our product," that memo famously boasted, "since it is the best means of competing with the 'body of fact' that exists in the minds of the general public."

As highlighted in this issue of *Catalyst,* UCS's latest report, *The Climate Deception Dossiers,* presents a collection of internal documents (some disclosed to the public as recently as this year) that leave little doubt that the world's largest fossil fuel companies—including Chevron, ConocoPhillips, ExxonMobil, and Peabody Energy—set out decades ago to knowingly deceive the U.S. public about the scientific evidence of global warming. And that the campaign of deception continues to this day.

These internal documents speak for themselves. Our report presents seven "deception dossiers" containing 85 separate internal company and trade association documents that have been leaked to the public, come to light through lawsuits, or been disclosed through Freedom of Information Act requests. UCS is making the complete collection available online.

I urge you to read them and draw your own conclusions. I believe they offer clear evidence that these companies knew the truth about climate science but nonetheless developed, participated in, or funded campaigns to deliberately sow confusion and block policies designed to reduce the heat-trapping emissions that cause global warming. It is high time to hold these fossil fuel companies accountable for their deceptive actions to forestall climate solutions and for their share of the damages we are already confronting as a result. {C}

***Ken Kimmell** is president of UCS.*

Photos: © iStockphoto.com/Olivier Lantzendorffer; © Richard Howard (Kenneth Kimmell)

What effective approaches have you found for communicating with those skeptical about the realities of climate change?

Establish a respectful relationship; focus on common, observable problems; avoid hot-button words and phrases that will set off automatic, identity-confirming responses; and realize that it takes time to communicate. There is no magic bullet. I have been "debating" this issue with a conservative neighbor for years. All the while, we have been building a relationship based on mutual respect and shared interests (dogs, kids). Recently, standing in several feet of snow with our dogs, I asked if he thought the weather was changing in Massachusetts—he did. What did he think we should do about it? His answer was shocking. He said we all needed to drive and consume less.

Dr. Frances Bigda-Peyton, Bedford, MA

I have gotten the most likes and the [fewest] negative comments from skeptics and deniers when I post this comment on publicly accessible climate change discussion blogs: "Even if one is skeptical about climate disruption caused by anthropogenic global warming, diversification of our power portfolio is sound economic, military, and environmental risk management in the face of irreducible future climate uncertainty, just as diversification of one's financial portfolio is sound financial risk management in the face of irreducible future financial uncertainty."

Larry E. Fink, MS, Owner and Principal, Waterwise Consulting, LLC

My husband and I have visited Glacier Bay and Athabasca Glacier twice: once 25 years ago and once last year. We took pictures both times. I show these pictures to those who deny climate change and they have to admit there is definitely a change. Many still say it is not human caused, but all admit there is a change. That's one step in the right direction!

Bonnie Simms, Hammock, FL

Experienced gardeners know something is happening. Growing seasons are lengthening, there are new pests (both flora and fauna), and rain events are more severe. Gardeners know this from their own experience and while it might be nice to plant pansies in the fall, which would have been foolish years ago, it makes folks nervous. If you speak to people's actual experience, they listen.

Conni Gratop Lewis, Charleston, WV

Avoid ineffective confrontational disagreements by using "Yes, and..." and "Like you, I..." statements that emphasize connections and agreement. For instance, "Yes, the climate has changed in the past, and that's precisely why we should be concerned now." Or, "Like you, I want to keep the American economy strong, and that's why we need to start addressing climate change now."

Todd Mitchell, Fort Collins, CO

WE WANT TO KNOW

What local steps do you recommend to help more people eat healthier food?

We will publish selected responses (edited for length) in the fall issue of *Catalyst*. Email your response to *catalyst@ucsusa.org*

[IN THIS ISSUE]

UCS Hits the Road to Connect with Coastal Communities

This year, members of the Union of Concerned Scientists' climate team packed their bags and traveled over the course of three months to cities and towns along the East and Gulf Coasts to discuss the growing threats of sea level rise and tidal flooding—with some of the people most affected. "We visited communities where tidal flooding is just starting to happen now, and some where it's starting to happen much more frequently," says Senior Analyst Erika Spanger-Siegfried. "We especially wanted to go to the most vulnerable communities."

From New Hampshire to Louisiana, the team met with city planners, chamber of commerce members, Native American leaders, local politicians, members of the Gullah-Geechee Nation (who have lived for generations on the coastal islands of Georgia and South Carolina), and students from historically black colleges and universities attending a climate change conference in New Orleans. Everywhere the team traveled, they discussed the local significance of the findings in *Encroaching Tides,* a 2014 UCS report that highlights the risks 52 East and Gulf Coast communities face from tidal flooding and sea level rise in the coming years.

Half of the communities studied in the report will experience at least 24 tidal floods annually within just 15 years. And some cities, such as Annapolis, Maryland, and Washington, DC, can expect more than 150 tidal floods each year by 2045—or a flood nearly every other day.

Spanger-Siegfried says the UCS team found receptive audiences in each community, eager to plan the steps they should take to deal with rising tides. Even a group in Delaware that was highly skeptical about climate change wound up asking thoughtful questions about adaptation strategies by the end of the UCS presentation.

"We found we really connected with people by meeting them in their own communities," Spanger-Siegfried says, "and had a real chance to amplify our impact."

In the near future, as sea level rises, high tides such as this one in Carolina Beach, North Carolina, will be able to reach farther into communities, creating flood conditions that last longer and disrupt business as usual for growing numbers of people.

What's Eating the School Nutrition Association?

UCS has been working to prevent Congress from rolling back its requirements for healthful, nutritious school lunches, and calling for renewal of the Healthy, Hunger-Free Kids Act (HHFKA) of 2010. Our *Lessons from the Lunchroom* report (February 2015) underscored the benefits of including real fruits and vegetables in school lunches—especially for kids who are eligible for free or reduced-price meals.

But an unlikely opponent has emerged: the School Nutrition Association (SNA), a national organization representing the more than 55,000 men and women who prepare and serve food in U.S. schools. The SNA has aligned itself with lobbyists attempting to make HHFKA standards optional.

Though it is ostensibly dedicated to nourishing kids, the SNA has powerful financial backers that have a stake in rolling back progress on healthier school meals. Among the most prominent of its sponsors: processed-food giants Domino's, General Mills, and PepsiCo. These wealthy corporations want Congress to believe that schools can't meet the current guidelines, and are seeking exceptions via the SNA.

While some school districts are finding compliance more challenging than others, the evidence (including the findings of *Lessons from the Lunchroom*) shows that the standards are helping kids eat healthier. UCS is therefore pushing Congress to not let struggling schools opt out but rather to provide better support and resources for them.

Thousands of UCS members and supporters have emailed the SNA, urging it to support healthful school lunches rather than the interests of big processed-food companies, but the organization has yet to respond. You can help keep the pressure on the SNA by visiting *www.ucsusa.org/action*.

UCS Divests from Fossil Fuels

UCS is proud to announce that the organization has essentially divested from fossil fuel companies—our stock holdings are now more than 98 percent fossil fuel–free.

While UCS has never directly invested in such companies, the board of directors learned in 2013 that some index funds and even some of the organization's so-called sustainability funds included small but not insignificant holdings in fossil fuel companies. With some research and expert assistance, the board's investment committee worked over the past 18 months to come up with a solution that allowed UCS to divest while continuing to use low-cost index funds that manage risk through diversification.

Our experience demonstrates clearly that even a midsize organization like ours with a conservative investment strategy can divest from fossil fuel companies with no material change in risk or return objectives. Our hope is that sharing our experience will encourage other organizations to do the same.

Photos: © USDA (lunchroom); © Steve Miller (NC flood)

UCS Confronts Attacks on Science

UCS is sounding the alarm about a multi-pronged legislative effort to undermine the use of science in protecting public health, safety, and the environment. No fewer than five bills now wending their way through Congress would, in various ways, make it harder to pass laws and regulations based on the best scientific evidence available.

Andrew Rosenberg, director of the Center for Science and Democracy at UCS, led the writing of a recent article in the journal *Science* that issues a call to arms for scientists. "The scientific community needs to push back," the article contends, adding that "the strength of our democracy" is at stake. Rosenberg's highly respected coauthors on the article include Neal Lane, former science advisor to President Bill Clinton; Lewis Branscomb, a science advisor to *four* U.S. administrations; and James McCarthy, UCS board chair and former president of the American Association for the Advancement of Science.

The bills in question employ a variety of approaches but all guarantee a common outcome: weakening the ability of science to inform federal policies. For instance, the Regulations from the Executive in Need of Scrutiny (REINS) Act would take important regulatory decision making out of the hands of the relevant agencies (which currently base their approval on scientific evidence) and instead require joint congressional approval. If either chamber failed to act, an agency would not be able move forward with a new rule until the next legislative session. Given the current polarization in Congress, the resulting gridlock would forestall the enactment of rules intended to protect public health and safety or the environment.

Another bill, the Secret Science Reform Act, would prevent the Environmental Protection Agency (EPA) from issuing regulations unless all the data, models, methods, and other information in the scientific studies used to develop the rule are made publicly available. While intended to sound like an effort to increase transparency, the bill contains a dangerous Catch-22: EPA data often come from studies based on confidential health records, business information, or intellectual property that the agency is legally prohibited from disclosing. The agency would therefore be effectively unable to issue new rules on power plant mercury emissions and a host of other toxic substances.

Three of these five bills have now passed in the House of Representatives and four of them already have sponsors in the Senate, making it more likely for them to find their way to President Obama's desk.

UCS is fighting hard to stop these harmful bills in their tracks, and we'll be enlisting the help of our allies in the scientific community as well as our members and supporters. Stay tuned.

Victory on Low-Carbon Fuels

The stage: Oregon. A governor resigns amid scandal, and the low-carbon fuel standard he supported—due to expire this year—hangs in the balance. The Union of Concerned Scientists and its members make a strong case for the standard. Would state legislators and the new governor, Kate Brown, renew it?

Low-carbon fuel standards are designed to reduce the transportation

sector's global warming emissions by limiting fuels' carbon "intensity" and promoting cleaner alternatives to oil such as biofuels and electricity. Oregon enacted a low-carbon fuel standard in 2009, but it was set to expire without its carbon reduction requirements ever being fully implemented.

Fortunately for Oregon, UCS was able to help persuade state lawmakers and Governor Brown to renew the low-carbon fuel standard this spring, requiring fuel distributors to reduce the carbon intensity of fuels sold in Oregon by 10 percent over the next 10 years. UCS Senior Scientist Jeremy Martin reviewed the Oregon Department of Environmental Quality's analysis of the standard and flew to Salem to testify in favor of it at a key public hearing.

Equally impressive was the work of UCS members who flexed their muscles in a truly inspiring fashion. Of the 750 public comments the legislature received in support of the standard, 650 were from UCS supporters in Oregon.

Next up? Pushing for the adoption of a similar standard in Washington State.

Get News on Issues You Care About

Every day, UCS is posting news of victories you have helped us achieve, and opportunities for members to take action. If you're on our email list, you're hearing about them first. If you're not, sign up today at *www.ucsusa.org/join*. You'll learn about exciting ways to participate in UCS program work, and you'll know when that work has led to success.

CNN Improves Climate Coverage

The April 2014 UCS report *Science or Spin?* found that 30 percent of the climate change segments airing on the television news network CNN included misleading representations of science. The major culprit was debates about climate change that often included skeptics with a history of receiving funding from the fossil fuel industry. The report's recommendation? That CNN stop hosting such debates.

Putting our analysis into action, UCS issued an alert that mobilized some 27,000 members and supporters, including more than 1,000 members of the UCS Science Network, to call for change at the network. They urged CNN's head of standards and practices to improve the network's climate coverage and stop debating the "reality" of well-established science.

One year later, these efforts have paid off. CNN has now gone a full year with no misleading debates about climate change. Of course, as *Science or Spin?* coauthor Aaron Huertas notes, there's more to good climate coverage than simply avoiding misleading debates. Still, thanks to the help of UCS members and supporters, this is a welcome step in the right direction.

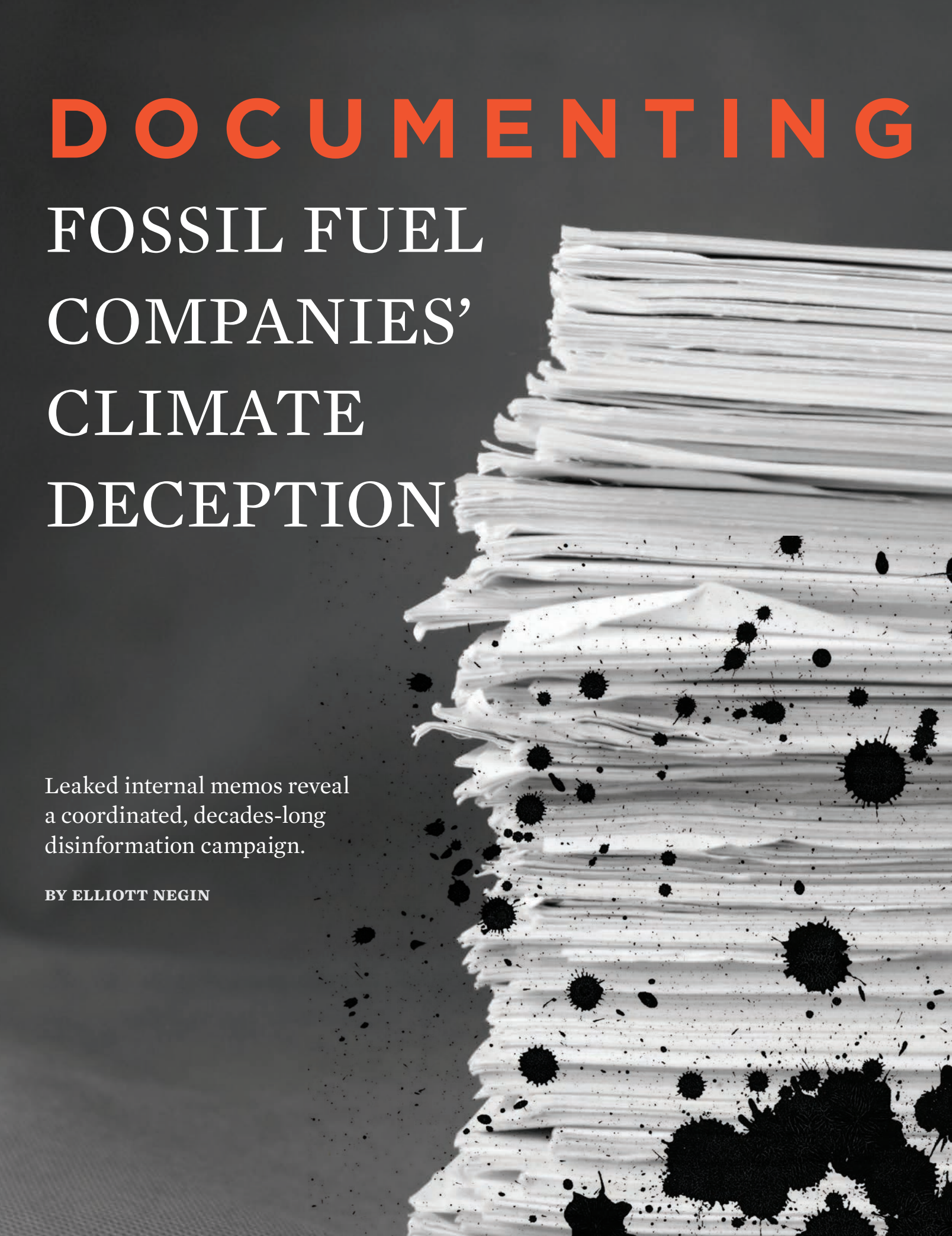
California Renewables Lead the Way

This spring, California Governor Jerry Brown issued an executive order that requires the state to achieve an aggressive new global warming emissions target: reducing emissions 40 percent below 1990 levels by 2030. These steep reductions serve as an important model of what's achievable, for both the nation and the world. It's also a particularly welcome development because UCS advocated for just such a plan last year, with a letter signed by 164 of the state's scientists.

Considering that California is the world's eighth-largest economy, its actions have implications far beyond its borders. Virtually all the evidence to date shows that California has profited mightily from its green energy economy: the state now has the largest advanced energy industry in the United States, with some 500,000 workers across 40,000 companies, and California's clean technology companies have attracted an estimated $27 billion of venture capital into the state since 2006. This experience can be replicated elsewhere, and UCS is actively working to help states around the country follow California's lead.

Photo: © Charles Benton (Hopland Solar)

DOCUMENTING FOSSIL FUEL COMPANIES' CLIMATE DECEPTION



Leaked internal memos reveal a coordinated, decades-long disinformation campaign.

BY ELLIOTT NEGIN

When internal documents revealed earlier this year that ExxonMobil and other fossil fuel interests were secretly funding scientifically discredited studies authored by climate contrarian Wei-Hock "Willie" Soon, the news didn't come as a complete surprise.

Back in 2007, a Union of Concerned Scientists (UCS) report identified Soon—an aerospace engineer with little formal training in climatology—as one of a dozen scientists affiliated with more than 40 ExxonMobil-funded think tanks that then constituted the backbone of the climate change–denier PR machine. Soon, who erroneously claims the sun is largely responsible for global warming, produced work for at least five of these ExxonMobil-backed groups, including the now infamous Heartland Institute.

But the latest cache of documents, obtained by Greenpeace and the Climate Investigations Center through a Freedom of Information Act (FOIA) request, lays bare a wealth of detail that was not available eight years ago. For example, they show that Soon received his funding exclusively from fossil fuel interests, including ExxonMobil, utility giant Southern Company, and Charles Koch. He described his scientific work and congressional testimony as "deliverables" to his funders. And some of his contracts specifically dictate that the Harvard-Smithsonian Center for Astrophysics, where Soon works, not disclose the names of his funders. These internal documents, on top of what UCS had already uncovered, indisputably establish Soon's efforts as part of a calculated climate deception campaign.

DOSSIERS OF DECEPTION

Willie Soon, however, is just a small part of a much bigger story, according to a new UCS report, *The Climate Deception Dossiers*. After spending nearly a year reviewing and analyzing a wide range of internal corporate and trade group documents, a team of UCS researchers has, for the first time, compiled a broader tale of climate deception. *The Climate Deception Dossiers* draws upon evidence culled from 85 documents that were pried loose by leaks, lawsuits, and FOIA requests.

Spanning nearly three decades, these documents reveal that the world's largest fossil fuel companies—BP, Chevron, ConocoPhillips, ExxonMobil, coal giant Peabody Energy, and Shell—were fully aware of the reality of climate change but continued to spend tens of millions of dollars to sow doubt and promote contrarian arguments they knew to be wrong. Taken together, the documents show that these six companies, in conjunction with the American Petroleum Institute (API)—the oil and gas industry's premier trade association—and a host of front groups, have colluded to intentionally deceive the public; their corporate officials have known for at least two decades that their products are harmful; and their disinformation campaign continues today—despite the fact that most of the companies now publicly acknowledge the reality of anthropogenic, or human-caused, climate change.

> ***The documents reveal a variety of tactics: front groups, secret funding to purportedly independent scientists, even forged letters.***

The collected documents reveal a variety of deceitful tactics, including creating front groups, secretly funding purportedly independent scientists such as Soon, and even forging letters from nonprofit groups to try to influence members of Congress. But you don't have to rely on UCS's interpretation. All 340 pages of the documents in seven "deception dossiers" are available online at *www.ucsusa.org/decadesofdeception*, so you can read them and reach your own conclusions.

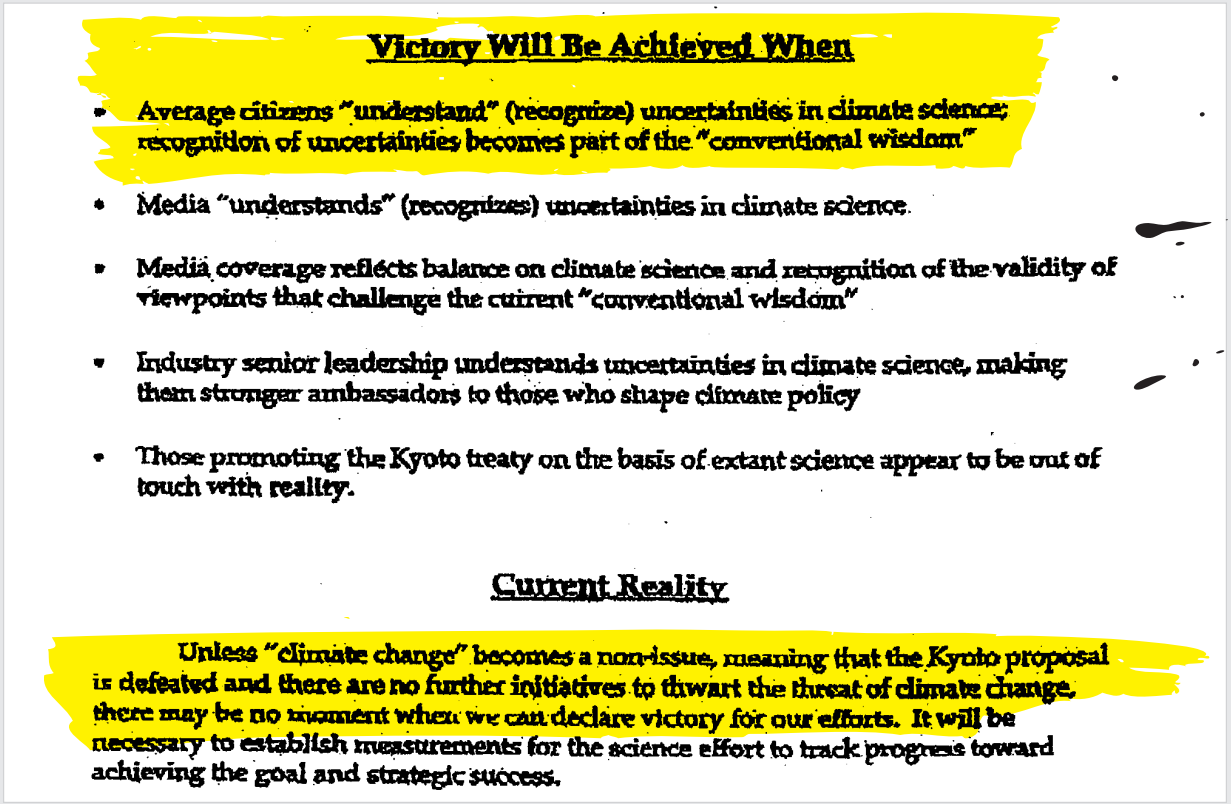
A DAMNING PAPER TRAIL

The 340 pages include not only Soon's contracts, but also a 1998 API disinformation road map memo as well as a 2014 Western States Petroleum Association memo on creating phony grassroots consumer groups to challenge California's climate policies.

One eye-opening, formerly secret document reveals that scientific experts commissioned by the Global Climate Coalition (GCC)—a coalition of 50 U.S. corporations and trade groups including British Petroleum (now BP), Chevron, Exxon, Mobil, and Shell—warned that heat-trapping gases were indeed causing global warming. Regardless, the GCC continued to conduct a multimillion-dollar lobbying and public relations campaign to undermine national and international efforts to address global warming.

One of the GCC's "backgrounders" for legislators and journalists, for example, claimed "the role of greenhouse gases in climate change is not well understood" and emphasized that

Photo: © Flickr/Phillip Wong



Victory Will Be Achieved When

- Average citizens "understand" (recognize) uncertainties in climate science; recognition of uncertainties becomes part of the "conventional wisdom"
- Media "understands" (recognizes) uncertainties in climate science
- Media coverage reflects balance on climate science and recognition of the validity of viewpoints that challenge the current "conventional wisdom"
- Industry senior leadership understands uncertainties in climate science, making them stronger ambassadors to those who shape climate policy
- Those promoting the Kyoto treaty on the basis of extant science appear to be out of touch with reality.

Current Reality

Unless "climate change" becomes a non-issue, meaning that the Kyoto proposal is defeated and there are no further initiatives to thwart the threat of climate change, there may be no moment when we can declare victory for our efforts. It will be necessary to establish measurements for the science effort to track progress toward achieving the goal and strategic success.

A team convened in 1998 by the American Petroleum Institute—the country's largest oil trade association whose member companies include BP, Chevron, ConocoPhillips, ExxonMobil, and Shell Oil—outlined a road map for climate deception including a plan to cultivate purportedly independent scientists as climate misinformers. The campaign would achieve "victory," according to the memo, when "average citizens" believed that the realities of climate science were uncertain.

"scientists differ" on the issue. But the 17-page, internal 1995 GCC primer written by the companies' own scientists states: "The scientific basis for the Greenhouse Effect and the potential impact of human emissions of greenhouse gases such as CO_2 on climate *is well established and cannot be denied* [emphasis added]." The primer's lead author, Leonard S. Bernstein, a staff scientist at Mobil Oil, would later participate as a lead author of the United Nations' Intergovernmental Panel on Climate Change reports in 2001 and 2007.

One draft version of the primer even addressed and dismissed the major arguments made by climate change contrarians, such as the "solar variability" argument touted by Soon. "The contrarian theories raise interesting questions about our total understanding of climate processes," the draft stated, "but they do not offer convincing arguments against the conventional model of greenhouse gas emission-induced climate change." This section was deleted from the primer's final version.

Three years later, the API set up what it called the Global Climate Science Communications Team to try to derail the Kyoto Protocol, the 1997 international agreement signed by 192 countries—but not the United States—to meet binding carbon emissions reduction targets. A leaked 1998 campaign memo from this team, cowritten by representatives of the API and API members Chevron and Exxon, laid out a road map for climate deception largely based on the tobacco industry's strategy to stave off government regulation by deceiving the public about smoking hazards.

Echoing that strategy—encapsulated in the notorious internal tobacco industry memo claiming "Doubt is our product"—the API memo states: "Victory will be achieved when: average citizens 'understand' (recognize) uncertainties in climate science." The API team planned to emphasize "uncertainties" in climate science at least partly by identifying, recruiting, and funding previously unaffiliated scientists. After all, the memo notes, such scientists would have more credibility with reporters and the public than those already known to be working with the fossil fuel industry.

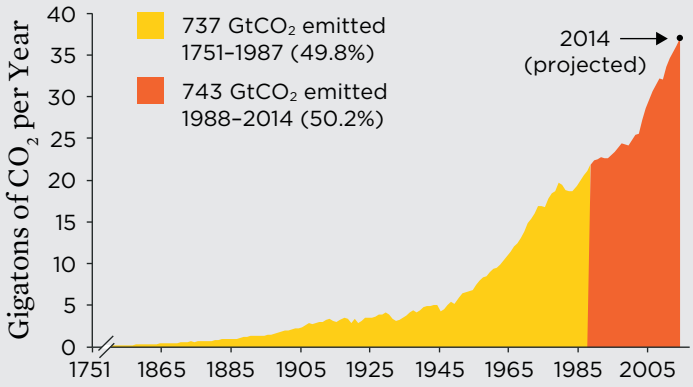
What makes the secret API memo so revealing is how closely its instructions seem to have been carried out in the Soon case. One of the API memo's contributors, Robert Gehri, even negotiated one of Soon's contracts on behalf of his industry backers. All told, Soon received more than $1.2 million from fossil fuel

> ***UCS is making the full deception dossiers—more than 340 pages of documents—available online.***

interests over the last decade and failed to disclose that conflict of interest in most of the scientific papers that money underwrote. More than $400,000 came from a subsidiary of the Southern Company, a large utility holding company with a fleet of coal-fired power plants. ExxonMobil gave Soon $335,000. The Charles G. Koch Charitable Foundation kicked in another $230,000. The API, meanwhile, contributed more than $100,000.

What did they get for their money? The papers conclude that solar activity is the main cause of global warming and that carbon emissions have had little or no impact. Despite the speciousness of Soon's findings, members of Congress—notably Oklahoma Senator James Inhofe—routinely cite his work to argue that climate science is a hoax.

Half of Industrial Carbon Emissions Have Been Released Since 1988



Although the Industrial Revolution began more than 250 years ago, more than half of all industrial carbon emissions have been released since 1988—after major fossil fuel companies knew about the harm their products were causing.

HOLDING THE PERPETRATORS ACCOUNTABLE

The tobacco industry successfully stalled meaningful regulations for decades. The fossil fuel industry has been using virtually the same strategy, at least when it comes to federal legislation. Meanwhile, as the fossil fuel companies' deception campaign has continued, we've taken a heavy toll in rising temperatures and a host of climate impacts.

As the new UCS report notes, recent research has documented that 90 state and privately owned corporations alone have produced and marketed the fossil fuels and cement responsible for nearly two-thirds of the world's industrial heat-trapping carbon emissions over the past two and a half centuries. Of these, 50 are investor-owned coal, oil, and natural gas companies, including BP, Chevron, ConocoPhillips, ExxonMobil, Peabody, and Shell. Furthermore, nearly 30 percent of all industrial emissions can be traced to just *20* investor- and state-owned companies.

What's more, the rate of carbon emissions has increased dramatically in our rapidly industrializing world. As a result, more than half of all industrial carbon emissions have been released into the atmosphere since 1988—*after* major fossil fuel companies indisputably knew about the harm their products are doing to the climate.

WHAT IS TO BE DONE?

There are a number of potential ways to hold large industrial polluters accountable for their actions. Shareholder engagement, divestment campaigns, and state court litigation could all play an important role in forcing them to take responsibility for their emissions, ending their disinformation campaigns, and even requiring them to pay reparations to cover the cost of climate damages, preparedness, and mitigation. The most effective tactics remain a subject for debate. But, as the picture of the fossil fuel companies' efforts to deceive the public becomes clearer, it is high time to hold these companies accountable for their actions and the damage they've done. {C}

Let's Hold Fossil Fuel Companies Accountable

Historian of science Naomi Oreskes reviews the decades-long campaign to deceive the public about climate change—and what it will take to end it.

Naomi Oreskes is a professor of the history of science at Harvard University. She is the coauthor of *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* and *The Collapse of Western Civilization: A View from the Future,* both with Erik M. Conway. The documentary film version of *Merchants of Doubt,* produced by Participant Media, was released in 2015.

The new UCS report The Climate Deception Dossiers *highlights internal memos from fossil fuel companies that suggest a coordinated campaign of deception. How strong is the evidence, in your view, for such a campaign?*

N.O.: I think it's demonstrated. Full stop. The documentary evidence is clear. The only thing we could argue about is the word "deception." My coauthor Erik Conway and I coined the phrase "merchants of doubt" because the goal of the groups and individuals we studied was to create doubt, as the tobacco industry had done before them. Based on the tobacco case, they knew that creating doubt was an effective means to undercut the momentum for action.

The tobacco industry created doubt about the link between smoking and lung cancer. Did you find a connection between these efforts and the campaign against climate science?

N.O.: Just as the evidence of the fossil fuel companies' deception campaign is clear, so too is the evidence of this campaign's connection to the tobacco industry. We showed that the overall strategy was essentially the same, and that many of the specific tactics were the same too. We also showed that this was not mere coincidence—that many of the same individuals and organizations were involved in both.

As you've noted, these industries understood that what you call "merchandizing doubt" can be an effective strategy for blocking science-based political action. Why does this seem to work so well?

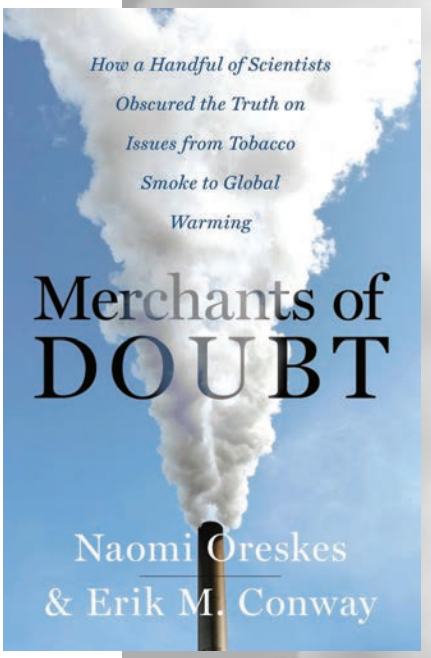
N.O.: It works because it is rational. If we really didn't know whether or not smoking was harmful, then it would not make sense to try to discourage people from smoking. And if we didn't really know that increased global warming emissions were driving climate change, we wouldn't have a case for a carbon tax.

The United States still has not passed legislation to cap heat-trapping carbon emissions or place a price on carbon, and elected officials continue to deny industry's role in global warming. Do you see this as evidence that the fossil fuel industry's campaign has worked?

N.O.: Absolutely. We can't prove that the doubt mongering has led to inaction, but we can say that the goal of the doubt mongering was to prevent action, and inaction has in fact occurred. Many factors have contributed to denial and delay, but I think it is reasonable to conclude this is one of them, especially when we see politicians using slogans and memes that originated in doubt-mongering campaigns.

> ***"Major companies…will change when they have to change, either because of laws or because of social pressure."***

You have been involved in work showing that just 90 entities—including some of the largest investor-owned fossil fuel companies—are responsible for almost two-thirds of the world's industrial carbon emissions over the past two and a half centuries. To what extent do you believe these companies should be held accountable for the consequences of climate change?



N.O.: They should be held accountable for their full share of carbon emissions, after the point at which the scientific evidence of the harms of [human-caused] global warming became clear. I would say that is certainly no later than 1992, when the United States signed the United Nations Framework Convention on Climate Change. Arguably it is no later than 1988, when the Intergovernmental Panel on Climate Change was created, when Congress held hearings on the threat posed by global warming, and when the story was on the front page of the *New York Times*. And there might be a case to be made that it is even earlier than that.

What do you think are the most important steps we need to take to break the current political logjam? What role can—or should—we expect from the major fossil fuel companies?

N.O.: I think we can expect the major companies to continue business as usual until they see the writing on the wall that this is not going to be acceptable very much longer. They will change when they have to change, either because of laws or because of social pressure. I used to work in the mining industry, for a good company, and we obeyed the law. Most companies do. But, with rare exceptions, they don't go beyond that to do what is *right*, until they are required to do so by law or forced to by social pressure. This means that the key factors now are social and political: to create the needed pressure.

This is one reason I support the divest/reinvest movement. We have to send a strong signal that we will not continue to invest in the development of still more fossil fuels. No, let me correct that: it is not just about sending a signal—*we have to stop investing in fossil fuel capacity*. That won't happen overnight, but we have to begin the process now if we are going to get where we need to be in the next few decades. To put it in a slightly counterintuitive way: we have to start the process of stopping. {C}

Photo: © iStockphoto.com/Cameron Strathdee

THE UCS SCIENCE NETWORK: PUTTING SCIENCE INTO ACTION

No scientist is an island.
Together, we make a difference.

BY PAMELA WORTH

The Union of Concerned Scientists is proud to have the support of more than 450,000 members and supporters across the United States, putting science to work to address some of our planet's most pressing problems. We succeed by blending expertise and advocacy. We use science to analyze problems and develop practical solutions, drawing upon the support and savvy of our members to help put these solutions into action.

Since 2010, as part of this broader effort, we have developed and nurtured a powerful tool: the UCS Science Network—a community of nearly 17,000 scientists, engineers, doctors, students, public health specialists, economists, analysts, and other experts across various fields who join together to apply their scientific backgrounds to the issues they care about and help push for practical solutions.

With nearly 17,000 scientists, engineers and other experts, the UCS Science Network puts science to work.

Science Network members use their expertise to make a difference, by speaking to the media, delivering testimony, signing on to expert letters to elected officials, conducting research, and serving on governmental advisory committees. Consider just one example: the UCS Science Network recently mobilized more than 200 Michigan scientists, engineers, economists, and technical and health professionals to sign an open letter in support of raising Michigan's renewable electricity standard (which requires utilities to supply a specific share of their electricity from renewable resources) to 25 percent by 2025. Many of these Science Network members also paid visits to their elected officials. They pointed to UCS research showing that increased reliance on renewables could help boost Michigan's economy, sparking new investments and creating new jobs that cannot be outsourced—all with minimal costs to consumers. They also showed how the stronger standard would reduce air pollution, improve public health, protect the Great Lakes and other water resources, and help rein in global warming emissions.

In addition to mobilizing around specific actions like this, UCS Science Network members meet at forums, seminars, and workshops across the country, sparking new collaborations and ideas. They post blogs on their work at *www.ucsusa.org*, where their research reaches a large national audience. Together, they fight back against attacks on science and research, and become resources in their communities for other scientists.

SCIENTISTS + CITIZENS = ACTION

UCS couldn't do its work without combining the talents of technical experts with the power of concerned citizens across the country. As part of our broader efforts, the Science Network offers specialized resources, support, and training to help these civic-minded scientists and technical experts to become more effective advocates. One recent example is a Science Communication Portfolio toolkit coauthored by member Dr. Elisha Wood-Charlson, available on the Science Network site (*www.ucsusa.org/science-network*), which helps scientists translate their research for different audiences and influence decision makers.

Plus, the Science Network offers a place where scientists can turn for support, professional connections, and advice, or to learn about the great work being done by other experts in their fields. This can be especially helpful when research grows isolating, when the struggle for funding becomes exhausting, or when political discourse in a given discipline feels limiting.

Today, the UCS Science Network boasts scientists in every state in the country, and in fields from astrophysics to zoology. Some are Nobel laureates and National Medal of Science recipients. Others are graduate students and early-career scientists or public health specialists. (For more on Science Network demographics, see the box on p. 17.)

Three Science Network members are profiled below, each from a different region, working on different problems. Despite these differences, however, all are passionate about putting science into action to make a positive change in the world. Their stories serve as an inspiration by reminding us how truly powerful we can be when we combine forces.

LAKIA MCMILLAN: PRESERVING SAFE DRINKING WATER

"The Science Network offers a way for me to get more information and stay in touch with what's going on in the science world."

Back in January 2014, LaKia McMillan was looking into potential topics for her master's thesis in environmental toxicology when Andrew Whelton, her professor at the University of Southern Alabama, alerted her to a devastating chemical spill in West Virginia, more than 800 miles away. The spill had left some 300,000 residents without safe, clean drinking water, and Whelton was gathering a team to travel to Charleston to conduct chemical analyses on their water. McMillan volunteered to help. "We got in the van and started driving," she says.

Photo: © Pam Brown-McMillan (LaKia McMillan)

Fifteen hours later, McMillan, her professor, and three other graduate students arrived in West Virginia to mixed reactions from residents. Some were anxious about having the team test their water; others were confused. Many hadn't followed the water company's directive to flush their systems to remove all traces of a toxic chemical known as MCHM (4-Methylcyclohexanemethanol) that had leaked into their supply.

"People were afraid," says McMillan. "They were getting all this conflicting information: 'do this, don't do this.' Being able to help them with scientific facts was the most important part of the experience to me."

She and her colleagues worked for hours in people's homes, testing their water and helping them flush their systems. When they returned to Alabama a week later, McMillan began experiments for her thesis on whether MCHM can be absorbed into common PVC plumbing pipes, potentially further contaminating household water.

McMillan says she uses the UCS Science Network to keep abreast of career opportunities and areas of study that interest her. Ultimately, she says, she hopes to work for the Environmental Protection Agency. As she puts it, the Science Network offers "a way for me to get more information and stay in touch with what's going on in the science world," adding that, "If nothing else, what happened in West Virginia shows the importance of the work that we do.

"We take for granted that we can walk into the kitchen, turn on the water faucet, and get a drink, or go into the bathroom and take a shower. You don't realize how big an effect something like this has until it happens."

FELIX AGUILAR: FIGHTING CHILDHOOD ASTHMA

"The UCS Science Network helps bring us together and forms a community with a unified voice and intent."

When Felix Aguilar began practicing medicine in the port city of Long Beach, California, he was staggered by the number of young patients with asthma. It was, he says, the top emergency room diagnosis for children at his clinic and the top medical reason for school absences in the city. Disturbed by the scale of the problem, Aguilar, site medical director at AltaMed Health in Los Angeles and clinical assistant professor at the University of Southern California, began to look for answers.

> *The Science Network boasts scientists in every state in the country, and in fields from astrophysics to zoology. Some are Nobel laureates; others are graduate students and early-career scientists.*

One major culprit: the freeway, Interstate 710, serving the port complex of Los Angeles and Long Beach. Along this route, abutting many low-income communities, a significant percentage of the nation's freight enters the country on diesel trucks. "The impact of the pollution on the communities that live along the 710 corridor is tremendous," Aguilar says. "What we have is the collision of world trade with local health."

Aguilar wanted to help prevent asthma, not just treat it. To that end, he joined the Long Beach Alliance for Asthma. He also joined the UCS Science Network, which he says he depends on to provide solid scientific evidence for his advocacy. Earlier this year, he teamed up with Don Anair, research director and deputy director of the UCS Clean Vehicles program, to coauthor an editorial calling for clean freight standards and reduced pollution on the 710 freeway. He's also met with multiple elected officials to advocate for children's health.

"What we're asking for has to be grounded in science," he says. "UCS provides me with reliable scientific facts that I use when talking with elected officials. A lot of times I'll be questioned. And I'll be able to say, 'Here are the studies.'"

Aguilar also values the support inherent in the network. "I'm in my exam room; other members might be in their classrooms or labs. We know something's not right here, but we think, 'I'm just a little cog in this big machine.' The UCS Science Network helps bring us together and forms a community with a unified voice and intent," he says.

Before reaching out, Aguilar says, "I was there in my particular area of Los Angeles thinking: there's all this pollution, what can I do? It's been very rewarding to see how I can work for policy changes with other scientists, technical experts, and activists."

MEGAN ADAMS: WORKING ALONGSIDE NATIVE PEOPLES

"Scientific fluency is a currency, and the more people learn it, the more it gets distributed."

Ask Megan Adams how she spent her spring and she'll describe collecting bear hair from barbed-wire sampling stations baited with fish oil. The remote regions of British Columbia, Canada, where she conducted this research—accessible only by boat or private plane—are home to the Wuikinuxv band of First Nations people.

Adams, a PhD candidate in geography at the University of Victoria, studies predator-prey systems in collaboration with members of the Wuikinuxv, who accompany her and volunteer the use of their boats in return for technical training. Together, they track the bears' movements and population count; the rest of the year, Adams analyzes the data collected and conducts lab work back on campus.

"It's a pretty equal partnership," she says of her field work. Her scientific training, she says, has occurred largely side by side with First Nations peoples and other smaller communities such as fishing villages, where elder members provide ecological knowledge from years of observation. The local people are deeply invested in her research because climate change and pollution threaten their lands, and Adams wants to help empower these communities with scientific knowledge.

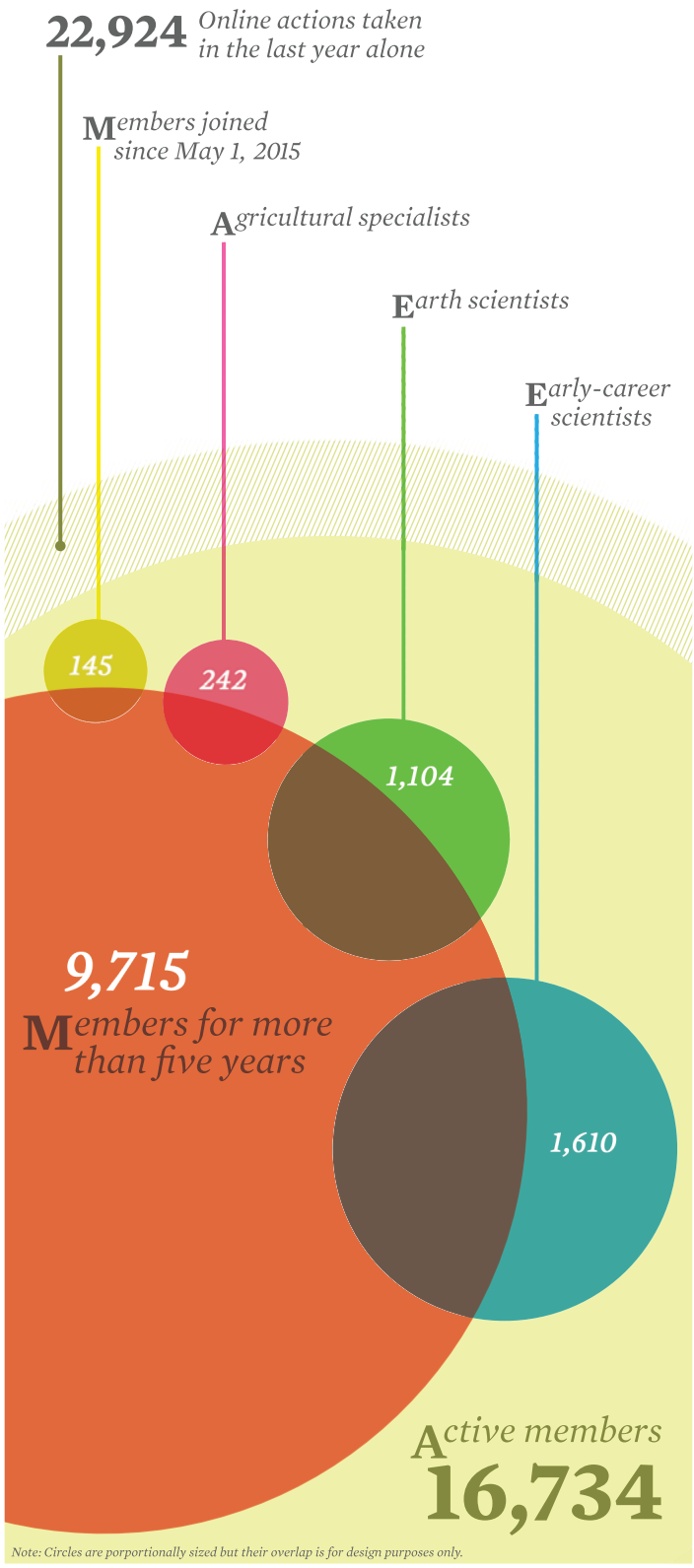
"Science is a privilege," she says. "It can be used against people who don't have it. If the band that I work with can talk the talk when they're meeting with our provincial government, they garner more respect. Scientific fluency is a currency, and the more people learn it, the more it gets distributed."

Adams says she appreciates how the UCS Science Network has offered her access to other scientists' research across fields, as well as camaraderie. "We're living in a landscape of funding cuts and weird politics," she says. "It isn't an easy era to be an objective but morally grounded scientist. We have to keep supporting each other."

Adams adds that she especially values the opportunity the Science Network gave her to describe her community-engaged research on the UCS blog, *The Equation*. The experience, she says, helped bring her work—and the ethos behind it—to a far broader audience. {C}

Photo: © Alexandra Morton (Megan Adams)

Science Network
BY THE NUMBERS



Working to Build Trust in Science

Sahar Houshdaran supports UCS because she believes in access to science for everyone.

As a molecular biologist, Sahar Houshdaran says she is often sought out at dinner parties to answer questions about science for curious friends. Some people might tire of discussing their work in social settings, but not Houshdaran. "It's my responsibility to explain," she says. "Science belongs to everybody."

Houshdaran is a postdoctoral fellow in the School of Medicine at the University of California–San Francisco, a career she says is the fulfillment of a long-held dream. By age 13, Houshdaran knew she wanted not only to be a scientist, but also to earn a PhD in molecular biology. Today, she says, she seizes every opportunity to inspire a similar passion for science in young people—but a lot has changed about the public perception of science. "It seems that some people have lost interest and trust in science and scientists," she says. "And people losing trust in science results in distortion, misrepresentations, and denial, with dire consequences."

That thought is troubling to Houshdaran, whose research focuses on reproductive health and disorders—in particular endometriosis, which can cause debilitating pain and infertility in women. "I don't know anybody who does science exclusively for fun. We really believe in its potential to help and improve human (and other species') lives," she says.

That's why Houshdaran patiently fields endless science questions and staffs her department's booth each year at the Bay Area Science Festival, where she teaches children to stain slides and view cells through microscopes. It's also why she says she supports the Union of Concerned Scientists' efforts to create a healthier planet and safer world by making science more accessible to the public.

> ***There are dire consequences when people lose trust in science.***

"In science, details matter. So if we don't explain what we do, the science can get misinterpreted. It can get oversimplified," she says. "I am an advocate for open access—and I joined UCS to help restore the role and status of science in society." {C}

Who's Fighting the Proposal to Label Added Sugar?

By Pallavi Phartiyal

Responding to the latest advances in nutrition science, the U.S. Food and Drug Administration (FDA) proposed last year to update the Nutrition Facts label that appears on all food packaging by including a new line listing the amount of "added sugars"—that is, sugar that does not naturally derive from the other ingredients. Because an estimated 74 percent of packaged foods contain added sugars, including many "unsweet" products such as soup and crackers, American diets frequently include far more sugar than consumers realize.

In addition to sugar's established role in causing tooth decay, a growing body of scientific research now finds evidence of a causal relationship between excessive sugar consumption and obesity, as well as serious chronic diseases including diabetes and cardiovascular disease. Some 25.8 million Americans are already afflicted with type 2 diabetes, and 16 million suffer from heart disease. Scientists, public health experts, and leading health and science-based organizations including the American Academy of Pediatrics, the American Heart Association, the World Health Organization, and UCS overwhelmingly support the FDA's proposal to amend the Nutrition Facts label.

INSPECTING FOOD INDUSTRY OPPOSITION

To learn who was opposing the change and why, UCS analyzed the public comments submitted to the FDA on the proposal. During the public comment period, from March 3 to August 1, 2014, the FDA received 35,507 submissions—nearly all in favor of the new label. A vast majority (more than 23,000) came from UCS members and supporters, while another 11,574 came from other individuals including academic experts. Not surprisingly, almost all of the fewer than 1,000 comments voicing opposition came from the food industry.

> ***Food industry opposition to an added-sugar label often distorted the scientific evidence.***

UCS determined that many of these industry comments contained serious distortions of the science pertaining to sugar and human health. For example, the Grocery Manufacturers Association erroneously stated, *"Because there is scant evidence to support the idea that added sugar contributes to ill health,* providing this information in a nutrition label will not help aid consumers in maintaining a healthy diet (emphasis added)." A comment from General Mills incorrectly asserted that, "Scientific consensus groups have found difficulty in determining any relationship between added sugars intake and health outcomes."

Aside from these blatant distortions of science, the UCS study found hard evidence that corroborates the following statement by pediatric endocrinologist Robert Lustig (author of the best-selling book *Fat Chance*): "The only ones opposed to limiting and labeling added sugar are the ones putting it in our food." To learn more visit *www.ucsusa.org/FDAaddedsugar*. {C}

Pallavi Phartiyal *is senior analyst and program manager for the Center for Science and Democracy at the Union of Concerned Scientists. The FDA public comment analysis presented here was conducted by* ***Abbie Steiner,*** *a food policy research assistant at UCS in 2014, as part of her graduate research at Tufts University.*

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