Union of Concerned Scientists

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Spreading the Benefits of Solar Power

Holding Carbon Producers Accountable

Big Victories on Trucks and Clean Energy

[Union of Concerned Scientists

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Progress and the Election

By Ken Kimmell

All eyes are naturally on the US presidential election, but the Union of Concerned Scientists is currently celebrating three hard-won and less-reported victories—all of which are covered in this issue of *Catalyst*.

This summer, the Obama administration issued rules to boost the fuel efficiency of our nation's trucks by almost 40 percent. UCS pushed hard for this measure, which, over time, will cut global warming emissions by more than 1 billion tons, reduce our oil consumption by about 2 billion barrels, and save consumers roughly $150 per year in reduced shipping costs.

In Massachusetts, a Republican governor recently signed a bill to ensure that by 2030, almost 40 percent of the state's electricity will come from clean, renewable sources including offshore wind, a new industry that is poised to grow. UCS put its muscle behind this bill with solid economic analysis showing the advantages of this approach compared with an overreliance on natural gas.

> ***With many states now poised for action, momentum for clean energy is on our side.***

And in California, the state legislature enacted a UCS-backed law requiring a reduction in global warming emissions to 40 percent below 1990 levels by 2030—one of the most ambitious targets adopted by any state or country. UCS helped lead a coalition to ensure that California maintained its worldwide leadership in addressing climate change and growing its economy.

On the eve of this most consequential election, these victories underscore how critical governmental leadership is when it comes to tackling our most pressing problems. But UCS staff, members, and supporters have long demonstrated our ability to press for vital changes, grounded in science, in many different political climates. With many other states poised to follow the examples set by California and Massachusetts, we take heart that momentum for clean energy—for our transportation and energy systems—is on our side. {C}

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

Photos: © adamkaz/iStock (buttons); © Richard Howard (Kenneth Kimmell)

We asked: What climate impacts are you seeing near you and how is your community addressing them?

WHAT OUR MEMBERS ARE SAYING

In the Northeast, we are seeing more intense rainstorms, often leading to flooding and washing out undersized culverts beneath our roads and railroads. Massachusetts is finally contracting with the US Geological Survey to update our flood-flow calculations (think 100-year storms now happening every 2 to 10 years). Our state also came up with the Massachusetts River and Stream Crossing Standards for all new roads, encouraging road/stream crossings to be upgraded when major road repairs are undertaken.

Jane Winn, Pittsfield, MA

I'm seeing drought, excessive heat, much milder winters, and flora and fauna stresses.

Edward Klein, Ridgeland, MS

Because of my lifelong interest in entomology (70 years), I have always been aware of the insects around me, wherever I was living. Nowadays, there are almost none—especially bees and butterflies. I miss the little critters.

Jackie Stewart, Tuscaloosa, AL

With rising seas, the impact of a Category 3 to 5 hurricane in my area will produce more destruction than before. MacDill Air Force Base near me is now drawing up plans to counter the rise in sea level forecast for the years to come. And property insurance for residences located in floodplains (which cover practically all of two nearby counties) is slated to rise substantially in the next 10 years.

Tom Cleary, Tampa, FL

FROM FACEBOOK

Daniel Guillot Nature is the best indicator that our world is warming up. Mangroves, which were once limited to the southern part of Florida, are now spreading northward. Alligators are now found in the Mississippi River in Kentucky. Warm-water fish are replacing cold-water fish in Long Island Sound. Birds are migrating northward two weeks earlier. . . . Everyone . . . should pay attention.

Elena Prisekin Longer, milder winters in Alaska but with record snows. I never had to get flood insurance, but was recently recommended to get it for my house.

Ann Larsen Whittier Where I live, a half mile from the ocean in Salem, Massachusetts, water surging from the North River onto the street was deep enough to go over the top of my rubber boots. Crazily, Salem has two huge building projects planned for just this stretch. People driving by when I was taking pictures of the flooding asked, "What happened? Water line break?" I said, "No. Just high tide and climate change."

[IN THIS ISSUE]

Game-Changing Victories In Three States on Clean Energy

Big clean-energy victories in three key states this summer have added up to a major boon for global climate change and are likely to transform the US energy sector.

In late August, with a major push from UCS, the California legislature ratcheted up its leadership on clean energy by requiring a reduction in global warming emissions to 40 percent below 1990 levels by 2030—one of the most ambitious targets adopted by any state or nation.

The Massachusetts legislature, at the very end of its legislative session in July, passed an ambitious energy bill ensuring that, by 2030, nearly 40 percent of the state's electricity will come from renewable sources—including a major commitment to offshore wind power that will help jump-start a promising new source of clean energy. UCS played a key role by providing an economic analysis showing renewables' benefits relative to an overreliance on natural gas in the state.

Equally noteworthy, the day after the Massachusetts bill passed, the New York Public Service Commission approved Governor Andrew Cuomo's plan to obtain 50 percent of the state's electricity from renewable sources by 2030.

Each of these commitments to swift and dramatic increases in renewable energy is noteworthy in its own right. Taken together, however, they represent a game changer on global warming. These three states are home to some 65 million people—roughly 20 percent of the US population. And each state is an economic powerhouse: the combined gross domestic product of California, Massachusetts, and New York—roughly $4.25 trillion last year—would rank fourth among the world's *nations* (just after Japan's).

In other words, a populous and economically powerful group of US states just committed to major investments in renewable energy that will dramatically reduce our country's dependence on fossil fuels within the next 14 years. To meet their ambitious goals, these states will need to take action in the energy marketplace almost immediately.

These states' commitments guarantee a significant increase in green energy jobs, a substantial reduction in emissions from the burning of fossil fuels, and a resulting health benefit for these states' residents. The new commitments are also likely to drive down the already competitive price of wind and solar power, save money for energy consumers, and generally boost these states' economies. And they show that momentum is building toward a major clean energy transition—in red states and blue. Iowa, for instance, already generates approximately one-third of its energy from wind power, while Texas now has 10,000 wind turbines powering more than 4 million homes.

Much more remains to be done. But, with the latest game-changing moves in California, Massachusetts, and New York, other states would be wise to take note. Politics aside, we do seem to be approaching a tipping point where a state's inaction on its energy future risks burdening its residents with an overreliance on dirty, unhealthful, and likely more expensive energy from fossil fuels.

Massachusetts' new energy plan, signed into law this summer, includes a major commitment to offshore wind power.

Photo: Creative Commons/European Wind Energy Association (Flickr)

Baby Food: Too Much Sugar, Not Enough Oversight

The recent decision by the US Food and Drug Administration to label added sugars on all packaged foods was a huge win for public health—and for the UCS staff and activists who pushed for the rule, based on solid scientific evidence confirming the danger of consuming too much sugar. However, according to the new UCS report *Hooked for Life*, policies on added sugar need to go much further to protect the health of America's most vulnerable consumers: children.

The report finds that the food we give to our babies and young children is often overloaded with added sugar. Among other problems, this threatens to set kids up for a lifetime of sugar overconsumption and its consequences, such as diabetes, heart disease, and obesity.

What's more, nutritional guidelines and policies for children under five do not reflect all that we know about the health effects of sugar on kids; many foods marketed and intended for children feature nutrition labels geared to adult diets. With the food industry now spending $1.8 billion each year on ads directed at children that often hawk sugary snacks and drinks, more oversight is badly needed.

To find out what you can do to help support stronger, more effective policies to protect children's health, and to read *Hooked for Life*, visit *www.ucsusa.org/HookedforLife*.

Photo: © Ariel Skelley/Blend Images

Thanks to You, HEAL Has Met Its Match

This summer, UCS challenged our members to raise a million dollars to help fix our broken food system by funding the new HEAL (Health, Environment, Agriculture, and Labor) Food Alliance, of which UCS is a founding member. A generous anonymous donor offered to match all donations so that HEAL could launch a cohesive movement with the political clout needed to effect lasting change.

If you were one of the more than 5,000 UCS members who accepted the challenge, thank you so much! You helped us earn the matching funds in record time, raising a total of $2 million in support of sustainable agriculture, equitable food production and distribution, and healthier food. We're delighted that HEAL has your support as its members work to transform the way we produce and consume food in this country.

The hard work is now under way and we look forward to keeping you apprised of our progress. Stay tuned at *www.ucsusa.org/HEAL*.

HEAL FOOD ALLIANCE
health · environment · agriculture · labor

Big Rigs, Fewer Emissions

If you've spent any time driving on American highways, you know that the United States runs on trucks. Mail trucks, tanker trucks, 18-wheelers, delivery vans: these large vehicles make up just 7 percent of vehicles on the road, but consume 25 percent of the fuel sold in the United States—producing millions of tons of heat-trapping emissions in the process.

In a big win for the climate this summer, the Obama administration announced new fuel economy and global warming emissions standards for heavy-duty trucks—the strongest ever enacted for this class of vehicle. This is the second phase of a program that will nearly double the fuel economy of trucks from the current average of just six miles per gallon.

Knowing that essentially all materials, goods, and products spend time on trucks en route to consumers—and that transportation is the largest source of US global warming emissions—UCS has long been working on strategies to reduce carbon emissions from this sector. Building on our successful campaign to push the Obama administration to nearly double the fuel efficiency of cars and small trucks, UCS engineers and analysts turned their attention to the necessity of enacting similar standards for heavy-duty vehicles.

In a report released last year, UCS demonstrated the cost and emissions savings of applying existing technologies to today's trucks. Experts and members made sure that decision makers saw the math and felt pressure from their constituents. This hard work paid off: the revised standards will ensure that new trucks use 37 percent less fuel than they did in 2010, reducing oil use by 2 billion barrels over the life of these vehicles.

Better fuel efficiency also translates into money saved for companies and consumers. Large vehicle operators will save an estimated $170 billion per year on fuel and help drive down the cost of shipped goods. At least as important is the reduced impact of these vehicles on global warming: the new standards will eliminate 1.1 billion tons of carbon emissions over the life of the vehicles—or, by 2040, an amount equal to the output of 45 coal-fired power plants.

UCS Headquarters Upgrades Its Rooftop Solar Array

At UCS, we like to "walk the walk" on clean energy, which is why our headquarters in Cambridge, Massachusetts, has boasted a rooftop solar array for nearly two decades. And after a major upgrade this month, our new state-of-the-art photovoltaic array will generate more than six times the electricity of its predecessor.

The new panels themselves are almost twice as efficient as the old ones, and the array—across two different sections of the small amount of roof space available—has a total capacity of 13.7 kilowatts, roughly enough to meet the needs of two typical US households. For the nerdiest among our members and supporters, the new system even includes a Web-based monitoring system allowing visitors to track the amount of energy produced, and the rooftop's weather. Stay tuned to our blog for more information about how to access it.

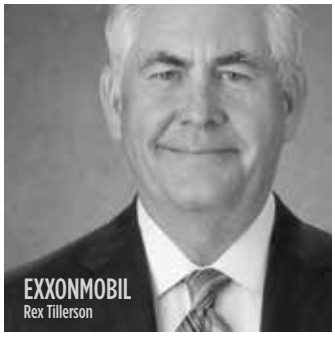
A worker completes installation of the new solar array atop the UCS headquarters in Cambridge, Massachusetts.

UCS Ranked as a Top Climate Change "Think Tank"

The International Center for Climate Governance (ICCG) recently released its 4th annual *Climate Think Tank Ranking*—an effort to determine "the highest impact think tank working on climate change economics and policy." The ICCG assessed 240 non-university-affiliated organizations worldwide, measuring them on their activities, publications, and ability to disseminate information. UCS is proud to have earned a second-place ranking in this data-heavy assessment—ahead of many well-known environmental groups. The Woods Hole Research Center, based in Falmouth, Massachusetts, came in first for the third year in a row.

Photos: © Audrey Eyring/UCS (solar panels); © DOUGBERRY/iStock (biker)

HOLDING CORPORATE CARBON PRODUC



With a New Scorecard, UCS Evaluates the Climate Record of Major Fossil Fuel Companies

BY ELLIOTT NEGIN

ERS ACCOUNTABLE

When assessing responsibility for global warming, politicians, journalists and others have historically tended to think in terms of nations. Even before the 2015 Paris Climate Agreement, for instance, the 1992 Kyoto Protocol—the first international legal framework established to address climate change—focused on countries' roles, differentiating between the developing world and advanced, industrialized nations whose economies have benefited the most from fossil fuels. From that perspective, China is currently the world's largest carbon emitter, followed by the United States (the top emitter until 2006), Russia, India, and Japan.

Researchers, however, are increasingly taking a different approach by focusing on the role played by fossil fuel producers. After all, nations do not emit carbon dioxide and methane. Hydrocarbon fuels extracted, marketed, and sold by companies do.

Thanks to a groundbreaking study by geographer Richard Heede, we now know that a relatively small number of investor- and government-owned companies are responsible for two-thirds of human-caused carbon emissions since the start of the Industrial Revolution. Heede's work, which originally appeared in the January 2014 issue of *Climatic Change*, finds that just 90 companies—50 investor-owned, 31 state-owned, and nine centrally planned nation-state producers of oil, natural gas, coal, and cement—accounted for 65 percent of worldwide carbon emissions between 1854 and 2013.

What's more, half of all these companies' total emissions have occurred *since 1988*, long after the scientific community and the public became aware of the serious threat posed by global warming.

In light of these facts, what responsibility do these large fossil fuel companies bear for climate change? And what role should they play now that, with the Paris Climate Agreement, the world has committed to move to a low-carbon future?

RANKING THE COMPANIES

The Union of Concerned Scientists, which has been exposing the fossil fuel industry's climate disinformation efforts for years, has compiled a scorecard designed to help answer these questions. In this new analysis, UCS ranks eight of the top investor-owned fossil fuel companies on a variety of key metrics related to their business practices. Listed in order of emissions magnitude, the UCS scorecard evaluates Chevron, ExxonMobil, BP, Royal Dutch Shell, ConocoPhillips, Peabody Energy, CONSOL Energy, and Arch Coal. Together, they are responsible for nearly 15 percent of worldwide industrial carbon emissions since the 1850s.

The overall finding? Unlike the children of Garrison Keillor's fictional Lake Wobegon, all the companies in the UCS survey are, for the most part, *below* average.

"These companies are substantial contributors to the problem of climate change and, if we are going to achieve swift and deep reductions in carbon emissions, they will have to take responsibility for their climate-related actions," says Kathryn Mulvey, a senior UCS analyst and lead author of the scorecard. "We found some differences in the climate-related positions and actions among the companies but, by and large, they all have a long way to go."

RENOUNCING CLIMATE DISINFORMATION

For a fossil fuel company to retain the public trust and social legitimacy needed to do business, step one is to make accurate public statements about climate science and renounce support for trade associations and advocacy groups that mislead the public about climate change.

How have the companies performed in these areas?

Only BP and Shell earned a passing grade for their public positions on climate science. In June 2015, BP, Shell, and four

Photos: © BP (Bob Dudley); © Business Wire (Ryan Lance); © Shell (Ben van Beurden); © Chevron (John S. Watson); © Tammy Shriver/*Times West Virginian*/Associated Press (Nicholas J. Deluliis); © ExxonMobil (Rex Tillerson); © CoalZoom.com (John W. Eaves and Glenn Kellow)

other European-based oil and gas companies sent a letter to the United Nations urging governments to set a price on carbon. "We want to be part of the solution," they wrote, "and deliver energy to society sustainably for many decades to come."

The lowest mark in this category went to ExxonMobil, which has consistently disparaged climate science and recommended that societies learn to adapt to global warming. "Mankind has this enormous capacity to deal with adversity," ExxonMobil CEO Rex Tillerson said at the company's 2015 annual shareholder meeting, "and those solutions will present themselves as the realities become clear." Never mind that the realities of climate change have been clear for many years—and the company's own scientists warned Exxon's upper management decades ago about the "potentially catastrophic" risks posed by global warming.

UCS also ranked ExxonMobil the lowest—with a designation of "egregious"—for its longtime support of climate science denier groups. The company has spent at least $33 million since 1998 on a network of more than four dozen think tanks, advocacy groups, and trade associations, many of which continue to distort climate science and denigrate renewable energy to this day.

Chevron, which routinely tries to block federal and state climate initiatives, joined ExxonMobil at the bottom. Both are members of the American Legislative Exchange Council (ALEC), a secretive business lobby group that denies human activity is driving climate change and provides its state legislator members with "sample" bills that seek to undermine renewable energy. Over the last several years, BP, ConocoPhillips, and Shell have laudably quit ALEC. But these companies each earned poor marks nonetheless for standing by while the trade groups to which they belong—including the American Petroleum Institute, National Association of Manufacturers, and the US Chamber of Commerce—continue to distort climate science and oppose government efforts to curb carbon emissions.

> *Despite some differences, all these companies still have a long way to go on climate change.*

DOING BUSINESS IN A LOW-CARBON WORLD

Because the products fossil fuel companies sell in the marketplace are directly responsible for carbon emissions, these companies have a special responsibility to transform their business models to reduce that threat. Practically speaking, this means publicly acknowledging the international community's commitment to a swift transition to a low-carbon future and supporting policies consistent with this goal. And it means taking immediate action to disclose and cut emissions from their current operations by, for example, ending the harmful practice of flaring natural gas.

How do the companies rank on these metrics?

Many of the companies appraised by the UCS scorecard have made general statements on their websites or elsewhere

In the new UCS report, ExxonMobil ranks lowest in the disinformation category for its longtime support of climate science denier groups. Above, an ice sculpture made by protesters melts in the sun at a 2006 shareholder meeting in Dallas, Texas.

Photo: © LM Otero/Associated Press

about the need to reduce carbon emissions, but most have stopped short of supporting specific policies. As mentioned above, BP and Shell now back carbon pricing, earning each of them a middling grade for their stated support of US government action. ExxonMobil also got a middling grade in this category. The company now claims to favor a revenue-neutral carbon tax, although its sincerity has been questioned given the fact that most of the members of Congress the company funds consistently vote against the policy.

All three coal companies ranked low for their continued support of efforts to block climate action in the United States. The largest of them, Peabody Energy, which is now in bankruptcy proceedings, ranked the worst in this category. It received an "egregious" rating for including climate science disinformation—namely, denying the existence of a scientific consensus about climate change—in its current legal challenge to the Environmental Protection Agency's Clean Power Plan.

UCS assessed fossil fuel companies on 30 metrics across four broad areas.

All the companies received poor marks on disclosing and reducing their own emissions. While more than 170 major companies have now committed to setting science-based targets to reduce their emissions in line with last year's international climate agreement, none of the companies UCS studied has yet done so. In fact, not a single fossil energy producer is among these companies.

All told, UCS painstakingly assessed these major fossil fuel companies on 30 metrics across four broad areas, including their disclosure of climate-related risks to their businesses, as stipulated by the US Securities and Exchange Commission. The report includes a series of recommendations to the companies, including that they sever ties with climate-denying trade associations and industry-affiliated groups or publicly commit to working within these groups to change their climate-related positions and actions. The full scorecard, including detailed rankings and specific recommendations, is available at *www.ucsusa.org/ClimateScorecard*.

"Fossil fuel companies will, in all likelihood, continue to operate for many years to come while we decarbonize the world economy," Mulvey says. "But they can no longer be allowed to mislead the public or their shareholders about the threat their products pose to the planet. We've identified a series of steps these companies should take immediately. And we're committed to keeping close tabs on them to pressure them to do so." {C}

Photo: © UCS

[STAFF SPOTLIGHT]

Kathy Mulvey: Fossil Fuel Watchdog

This spring, Kathy Mulvey, manager of the UCS climate accountability campaign, attended the 2016 ExxonMobil shareholder meeting in Dallas, Texas, with eminent climate scientist Michael MacCracken. Because ExxonMobil CEO Rex Tillerson has long disparaged the climate models used by climate scientists, Mulvey took the opportunity to bring Dr. MacCracken so he could confront Tillerson in person about what his company plans to do in light of the most recent scientific findings that the consequences of climate change are likely to be more severe than previously anticipated.

Mulvey has spent many a spring day inside annual shareholders' meetings—the key chance each year to bring corporate CEOs, board members, and top management face to face with the impact of their decisions. She's stood with Wayne Baker, who lost his larynx to tobacco, as he spoke his truth to decision makers at the shareholders meeting of the former cigarette manufacturer RJR Nabisco, and with Les Ann Kirkland, who confronted the principals at Dow Chemical's annual meeting with the realities of living in "cancer alley" near its facility in Louisiana.

Among her many accomplishments prior to joining UCS, Mulvey worked with Corporate Accountability International for two decades, serving as both executive director and international policy director. Now she's overseeing the UCS effort to hold accountable the major fossil fuel companies on their climate-related practices. "Too often, fossil fuel companies have been able to successfully mislead the public about climate science and block vitally needed climate action," she says. "I'm very grateful to the members and supporters of UCS for making this work possible and helping to both encourage and pressure these companies to break from climate deception and take responsibility for the impact of their products."

SOLAR POWER TO *All* THE PEOPLE

As Solar Energy Surges, UCS Focuses on Spreading Its Benefits

BY PAMELA WORTH

Earlier this year, solar power in the United States passed a significant milestone: more than a million installations across the country are now online, busily converting the sun's power to electricity. And the number is growing quickly. Of these solar installations, the overwhelming majority—94 percent—are photovoltaic panels installed on home rooftops.

While solar was a luxury for many years, its average cost in the United States has dropped dramatically. The cost for solar panels themselves has fallen from more than $75 per watt 40 years ago to less than a dollar per watt today. From 2009 to 2016, the installed price of a typical household system fell by more than 50 percent—to somewhere between $15,000 and $30,000 in most states, and that price can drop significantly with tax credits. As the technology improves and the costs continue to fall, more Americans are choosing to go solar.

The widespread adoption of solar power and other renewable energy sources is a crucial step to forestalling the worst effects of climate change. But beyond that, the average American family has much to gain from going solar: saving on utility bills, potentially having reliable access to power during grid failures, and helping to generate clean energy that reduces toxic air pollutants from fossil fuel–burning power plants.

However, even less-expensive solar installations are still out of reach for many Americans with low and moderate incomes. Working-class families might not have the money to cover the up-front costs, good enough credit to take out a loan, or the ability to commit to a long-term lease. Renters and people living in multi-family housing face an equally daunting roadblock: it's hard to install panels on a roof you don't own.

A NEW SOLAR INSTALLATION WAS COMPLETED EVERY 82 SECONDS IN THE FIRST HALF OF 2016: MORE THAN 1,000 EVERY DAY

"We say 'solar for all,' but we must include people who don't own property," says Paula Garcia, energy analyst at the Union of Concerned Scientists. She's part of a team at UCS working on a long-term project to analyze which policies are most effective at promoting solar equity and providing access for all.

"There are a variety of barriers to solar because of income," she says. "We need solar policies that specifically address the challenges low- and moderate-income people face."

Photo: © Shawn O'Connor/Getty Images

ROOFTOP SOLAR IS NOW
CHEAPER
THAN THE PRICE OF ELECTRICITY SET BY UTILITIES IN
ALMOST HALF
OF ALL US STATES

According to the Pew Research Center, a majority of American households—80 percent—earn low to moderate incomes. These households represent a massive untapped opportunity for solar if the existing ways to serve them can be scaled up locally and nationally. There are many options for improving access to cheaper, cleaner energy, but these options need to be more widely available and understood.

INNOVATIVE FINANCING OPTIONS

Home owners and others seeking to avoid the up-front costs (and long-term maintenance) of solar installations have several choices in some states. **Solar leases** allow home owners to lease solar photovoltaic panels from a provider for a flat monthly fee, without paying for their installation; home owners have the option to buy or dismantle the systems when the lease ends. **Power purchase agreements** are similar arrangements in which a developer will lease not only the solar installation but also the power it generates, at a fixed rate. In states where these third-party arrangements are available, they're popular options for consumers. About 70 percent of new household systems nationally are based on these types of third-party approaches.

In some states, home owners can also take advantage of **on-bill financing**, wherein low-interest financing covers the up-front costs. The consumer immediately begins saving money on electric bills, and a portion of those savings are dedicated to repaying the loan. For those with poor or insubstantial credit history, on-time bill payment serves as a proxy for credit.

These options could easily be expanded across the United States if not for frequent regulatory battles in state legislatures. Regulations on third-party solar companies are necessary to protect people from unscrupulous lenders, but some of these fights appear to fit a nationwide pattern of political stalling on renewable energy, when fairer and more flexible financing options could help speed the spread of solar to all.

COMMUNITY SOLAR

For those who live in multi-family units, in homes whose rooftops don't get enough sun, or who rent instead of own their homes, community solar arrangements can provide access to solar energy. **Community solar** allows consumers to pool their resources and buy or lease a portion of a shared solar array, or buy a piece of its output. Their share of the electricity generated by the project is then credited to their electricity bill.

States, municipalities, project developers, and utilities can expand access to community solar for low- and moderate-income families by situating the systems in underserved communities, providing training for jobs in renewable energy, and "carving out" a budget for these installations from money allocated to existing renewable energy policies. They can also require portions of shared solar projects to serve lower-income households, as Colorado has done, for example.

EXPANDING EXISTING PROGRAMS

Some federal, state, and local programs already subsidize the cost of solar installations, and provide incentives for consumers to use renewable energy. A federal policy currently offers a 30 percent tax credit on the total cost of a solar installation, for example. And most states and utilities allow solar users who generate more electricity than they consume to get credit for the excess, a practice known as **net metering.** (continued on page 21)

Saving Money and Changing Lives

By Derrick Z. Jackson

Since 2009, California nonprofit GRID Alternatives has been helping to bring rooftop solar to low- and moderate-income communities at little or no cost, with financing drawn from state funds, foundations, and donations from the solar industry. As of this writing, GRID has overseen 6,000 installations, including nearly half of the 192 homes in the predominantly African American neighborhood of Broadway Heights in San Diego, and 35 of 42 homes in the Hmong and Latino neighborhood of Little Long Cheng in Fresno. Former* Boston Globe *reporter, Pulitzer Prize finalist, and UCS Fellow Derrick Z. Jackson spoke with residents about the impact solar has had.

In the Webster neighborhood of San Diego, a team from GRID Alternatives helps install solar panels for Myra Wilson, a retiree on a fixed income.

For most residents of Broadway Heights, it was out of the question to lay out $20,000 or $30,000 in cash up front for solar panels, or try a long-term lease with a typical for-profit solar company. When GRID Alternatives came along with flyers promising solar at no out-of-pocket cost, Willie Williams, a retired construction worker, first thought, "This is one of the greatest cons that ever came to Southern California."

Today, with negligible electric bills, Williams said, "I think it's the best thing that's happened to me since free Pepsi in college."

Further north in Little Long Cheng, Ivan and Lana Lopez were equally skeptical about GRID's proposal. "I saw their flyer and I thought for sure it was a scammer, since nothing's for free, and all kinds of groups come into communities of color like ours and survey us to death and promise things to us that never happen," said Ivan, 50, a fifth-grade teacher and a local leader of efforts to bridge cultural understanding between Latino and Hmong families.

"Right away I called the Better Business Bureau. When we were convinced, we went around the neighborhood telling everyone, 'You gotta jump on this.'" Jump they did. Frugal with electric use from the start, the Lopez family initially had bills of $80 to $100 a month. Today the bills run $15 to $20.

"Just because people here don't have all the resources of a wealthy suburb doesn't mean our desire is any less to be green," Ivan Lopez said. Lana jumped in to add, "I'd say solar is part of getting us back to the old ways of living the way we were meant to live, ways where nothing was wasted. Solar is part of that journey back."

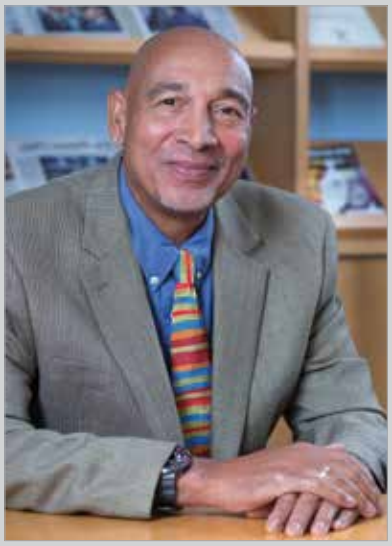
Ezekiel Morales, 56, needed the savings of solar at the time of this interview because he was between jobs in the Central Valley's agricultural fields. Through a translator, he said the electric bill for his family of six had gone from $2,100 a year to $200. Henry Alvarado, a 50-year-old handyman, and wife Rosemary, a 49-year-old school bus driver, said cutting their bill from $150 a month to $20 helped them buy a car. "That little extra means a lot to us," Rosemary said.

Back in Broadway Heights, Robert Robinson and Willie Williams said the first reason they bought into solar was not to go green, but to save greenbacks. Now that that's happened, they're talking about having the neighborhood declared an "eco district." "We're ready to get into the weeds of the whole environment," Robinson said. {C}

Photo: © Derrick Z. Jackson

Amplifying Less-Heard Voices on Solar Power

INTERVIEW WITH DERRICK Z. JACKSON



DERRICK Z. JACKSON is a UCS fellow, an award-winning journalist, and co-author and photographer of *Project Puffin: The Improbable Quest to Bring a Beloved Seabird Back to Egg Rock* (Yale University Press 2015). A longtime columnist, Jackson was a winner or finalist for national and regional journalism awards in 29 of his 37 years at the *Boston Globe* and *Newsday*, including being named as a 2001 finalist for the Pulitzer Prize in commentary. At UCS, he is working with the climate and energy program as well as the Center for Science and Democracy.

You've written on a wide variety of topics. What made you decide to come on board as a UCS fellow?

DERRICK Z. JACKSON: I was a columnist at the *Boston Globe* for 27 years, serving on the editorial board for the last several years. For a working-class kid from Milwaukee, that was a privilege and an honor. I pinch myself sometimes to think I have had that kind of voice in what people read—and hopefully what they think.

UCS was one of the smallest handful of sources that I always felt I could trust. As a journalist, you almost always have to go to tertiary sources to vet the work of most advocacy groups. But I was always impressed with the information UCS put out. The organization was right up there for me with the Pew Center for the Press: I knew that whatever they put out would be grounded in well-vetted data. For me, that seriousness and credibility was a big draw.

But, even more important, I was drawn to the mission of UCS. To reduce it a little bit: UCS is here to save the earth. One of my sons said it really nicely when I told him I was going to work with UCS. He said, "That's really cool. You write about a lot of things—racism and sports inequities, nature—but without the planet, none of it matters."

You recently traveled with UCS staff to communities of color where residents have adopted rooftop solar in fairly large numbers. What did you learn?

DERRICK Z. JACKSON: I visited Broadway Heights, a predominantly African American community in San Diego, and Little Long Cheng in Fresno, California, which is made up of about half Latinos and half Hmong. Thanks to the work of a nonprofit in California dedicated to solar access, nearly half of the 192 homes in Broadway Heights have rooftop solar and about 35 of the 42 homes in Little Long Cheng have solar.

> ***Climate change is not going to get solved unless all communities are engaged and empowered to do something about it.***

More recently, I visited a community in the heart of the southeast section of Washington, DC, that's virtually all African American. About one-third of the residents there are retired on a fixed income, and two-thirds are working class—public sector teachers, DPW workers. With rooftop solar on their townhouses, their electricity bills went from around $150 to $200 per month down to, in some cases, $30 or $50.

In all these communities, I've found that there's no question that when people have access to rooftop solar, they love it—people of all colors. One clear lesson is that the most powerful pathway to selling renewables to lower-income communities is cost, cost, cost.

I asked many of the people I spoke with whether they considered themselves environmentalists after getting solar. Some do. Some said they had noticed wind turbines when driving around and felt like they were part of something

Photo: © Harvard Kennedy School's Shorenstein Center

> *When I've gone out interviewing people about getting solar, it's been incredibly uplifting and energizing to see that communities are ready to be part of this.*

bigger. But, across the board, I found that what matters as much to them as being "green" is the green they're saving.

Despite the experiences of the neighborhoods you visited, UCS has found that the benefits of solar are not being equally spread around.

DERRICK Z. JACKSON: That's certainly true. We specifically set out to visit some communities where one type of program or another helped make solar more accessible to these communities.

It's an important part of the story because all the solar panels on the homes of celebrities won't make a difference, and all the walls that might get built around wealthier communities against rising seas won't matter if whole swaths of communities wind up being like the Ninth Ward in New Orleans after Hurricane Katrina.

UCS recognizes that the disproportionate beneficiaries of reducing costs through renewables will be the Jamelias and Juans in the inner cities. Going from an electricity bill of $200 down to $20 is far more monumental for them than it is for a wealthy family.

Thinking about your previous reporting on this issue, have these communities given you cause for hope about the potential to spread the benefits of solar power more fairly?

DERRICK Z. JACKSON: You know, sometimes you listen to the news and it can be drumbeat of downers. You can think: what in the world are we doing? And you can feel fairly hopeless.

But when I've gone out on behalf of UCS interviewing people about getting solar, it's been incredibly uplifting and energizing to see that communities are ready to be part of this.

I felt the same way when I went to the environmental justice forum sponsored by the Center for Science and Democracy at UCS last September. It was fascinating—there were ministers, local leaders, environmental justice folks who came from 50 to 60 miles away just to have a moment to tell those assembled that the same kinds of issues were happening in their communities too.

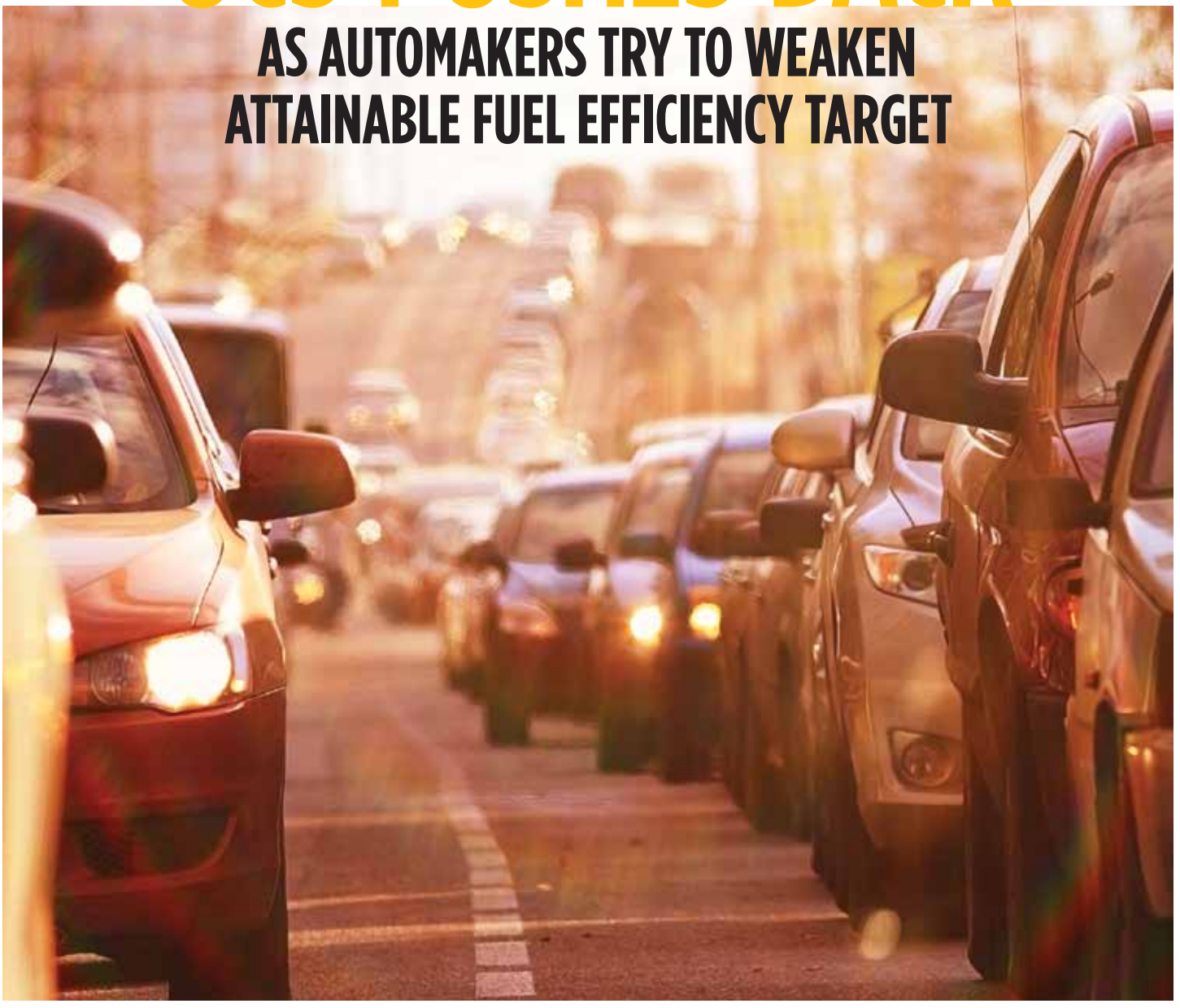
One of the highest privileges of journalism is when you can amplify the voices of those who are rarely heard and, for me, this is another way of doing it. Amplifying the voices of people getting solar, such as the African American part-time special education teacher I spoke with, is important especially because that's not who comes to mind for most people when you talk about solar.

At UCS, I've engaged with a range of people—of many different ages—and with an organization that's really making an effort on diversity. I find it energizing to be working with an organization that believes, as I do, that climate change is not going to get solved unless all communities are engaged and empowered to do something about it. {C}

Photo: © Audrey Eyring/UCS

UCS PUSHES BACK

AS AUTOMAKERS TRY TO WEAKEN ATTAINABLE FUEL EFFICIENCY TARGET



Dave Cooke, a senior vehicles analyst at the Union of Concerned Scientists, doesn't get flustered easily. But when he checked out the news coverage of a recent government fuel economy report, he was beside himself. "EPA Admits Defeat on Toothless 54.5 MPG Decree," one headline proclaimed. "54.5 mpg target is off the table, US regulators say," blared another. Cooke just shook his head: That wasn't the draft report's conclusion at all.

The report in question is a draft "mid-term" review of the first-ever fuel economy and tailpipe carbon emissions standards for cars and light trucks. After years of prodding by UCS and others, the Obama administration established the first round of these standards in 2010 for new vehicles sold between 2012 and 2016. Two years later, it extended the standards to cover model years 2017 to 2025,

setting long-term guidelines that will cut heat-trapping carbon emissions from the average new car or light truck by nearly 50 percent and boost average fleetwide fuel economy to as much as 54.5 miles per gallon (mpg).

Jointly produced by the Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA), the draft report fulfills the promise the Obama administration made to the auto industry to reexamine the technological and economic feasibility of the fuel efficiency standards. The administration is taking comments on the draft and will decide by sometime next year whether to relax the standards, tighten them, or just keep them the same.

WHAT DID THE MEDIA GET WRONG?

The standards never set a mandated target, Cooke explains. Instead, they were based on the market when the rules were introduced. At that time, the agencies estimated a fleetwide average target of 54.5 mpg-equivalent in 2025. But, he says, "As one would expect, projections change over time given more data. With the exact same rules as before, the report now projects a fleetwide target of 50.9 mpg."

What's changed is that low gas prices have encouraged consumers to buy more pickup trucks, vans, and sport utility vehicles and fewer gas-sipping hybrids or electric cars. Automakers insist that trend will make it more difficult for them to achieve the average fleetwide goal and are calling for the government to roll it back. However, as Cooke points out, changing buying patterns do not mean the auto industry cannot comply. Indeed, that's the conclusion of the draft report. "A wider range of technologies exist" for automakers to meet the original fuel economy goals "at costs that are similar or lower" than those used to set the standards, the report found.

Despite a trend toward larger cars, the government's assessment shows that automakers can meet current fuel efficiency standards with today's affordable technology.

It also pointed out that automakers have "over-complied" in the first three model years under the new standards, exceeding the targets by 1.4 mpg in 2014.

The main takeaway should be that the standards are working despite lower-than-anticipated gasoline costs, says Cooke.

"Based on the evidence to date, there's no doubt that the standards could—and should—be strengthened," he says. "There is affordable technology available right now that will enable automakers to attain the 2012 fuel efficiency standards' goals by improving gasoline engines alone." As the report documents, manufacturers are already ahead of the curve, surpassing the interim standards. As Cooke puts it, "Despite what the auto industry says, while it's true we're no longer on the 54.5 mpg trajectory, there's nothing to stop us from getting there." {C}

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The Record in California Is Clear: Climate Legislation Works

Left: California's landmark Global Warming Solutions Act, AB 32, was signed into law in 2006 by then-governor Arnold Schwarzenegger—the first law in the nation to mandate a statewide cut in heat-trapping pollution. Right: After a decade of success with AB 32, California Governor Jerry Brown signs the state's new carbon emissions reduction act into law this summer—setting even more ambitious targets for clean energy in the state.

By Adrienne Alvord

This summer, the California legislature continued its leadership in combating climate change with the passage of ambitious new targets that require the state to reduce its heat-trapping carbon emissions to 40 percent below 1990 levels by 2030. This impressive victory for clean energy is notable on its own but also because it marks 10 years of pioneering efforts by the Golden State to lead the way on climate and clean energy.

Back in 2006, California's Global Warming Solutions Act, often referred to as AB 32, was the first law in the nation to mandate a statewide cut in heat-trapping pollution: a nearly 25 percent reduction compared with projected "business as usual" emissions. It's worth taking a moment to reflect on that earlier milestone and its aftermath.

AB 32 set what was an ambitious and controversial target at the time—especially in the nation's most populous state, with its complex, car-dependent economy. Many wondered how such a big state, one that was already "cleaner" than most of the rest of the country, could possibly achieve such ambitious targets without starving its economy.

A group of fossil fuel and big business interests launched an aggressive lobbying and public relations campaign to oppose the bill. One of its advertisements predicted "painful consequences" if the bill were adopted, including job losses, reduced investment, and energy rationing. The *Los Angeles Times* quoted a fossil fuel–funded economist claiming the bill "would practically shut the state down."

DOOM PREDICTED, BOOM ENSUES

So what happened? The state's gross domestic product has increased by 12.4 percent since 2006; population and employment have each grown by more than 7 percent. At the same time, petroleum consumption has dropped by more than 14 percent and global warming emissions have been cut by 7.3 percent.

In other words, California is not only on track to meet its emissions reduction goals, but its economy is also growing—faster even than the rest of the country (tied with Oregon for the fastest growth rate in 2015).

For those of us who were in the trenches 10 years ago trying to get AB 32 passed, the results are gratifying. Today, as in 2006, a group of fossil fuel–funded special interests tried to oppose the new bill extending and strengthening AB 32's low-carbon targets. This time, though, a decade of facts and experience helped expose the naysayers' message for the empty rhetoric it is. California has demonstrated for other states and the nation as a whole that it is possible to achieve an aggressive—and urgently needed—economy-wide reduction in global warming pollution while maintaining impressive economic growth. {C}

***Adrienne Alvord** is the UCS western states director.*

Solar Power to *All* the People

(continued from page 15)

Federal, state, and local programs that already help cover the costs of energy efficiency upgrades for low- and moderate-income Americans could be expanded to also subsidize solar. One thriving statewide program along these lines is California's Single-family Affordable Solar Homes (SASH) program, which subsidizes solar installations via customer contributions, private financing, state cap-and-trade funding, and federal renewable energy tax incentives. (For an in-depth look at how some California families are benefiting from solar power, see the box on p. 14.)

This past summer, the Obama administration announced a new cross-agency initiative intended to increase access to solar energy: Clean Energy Savings for All intends to bring one gigawatt of solar—equivalent to some 200,000 typical household systems—to low- and moderate-income communities by 2020 through a combination of better financing, financial incentives for cities and towns to install solar arrays, and a job training network for those interested in working in the emerging solar sector. While the plan will take time to implement, Garcia says that the administration's commitment to spreading solar serves as "a top-down message that can help communities move forward."

BARRIERS TO SOLAR ACCESS

Many of the right ingredients are in place to expand access to solar energy: improved technology, reduced costs, the desire to reduce energy bills and minimize environmental impact, and evidence that solar power can be comfortably scaled up to cover the millions of Americans who would benefit.

TAX CREDITS AND REBATES CAN CUT THE TOTAL COST OF A ROOFTOP SYSTEM TO LESS THAN $10,000

Some of the biggest barriers appear to be political. Some politicians who receive money from fossil fuel interests and utilities aren't willing to back policies promoting renewable energy. Some even claim it's unfair to subsidize renewable energy, despite the fact that federal and state governments have subsidized fossil fuel production for decades—at the expense of our health and environment.

The fossil fuel industry also funds lobbying groups that seek to de-prioritize expanded access to solar energy, often by misleading voters. One particularly effective strategy for some groups has been to play on constituents' fears of a wealthy elite that decides to "go off the grid," forcing those who can't afford their own solar panels to pay more for their power. These worries are understandable: movements supporting renewable energy—and the environmental movement as a whole—have a history of not including underserved communities. It's time to do better, Garcia says.

NEARLY 209,000 AMERICANS WORK IN THE SOLAR ENERGY FIELD—AND THAT NUMBER IS EXPECTED TO DOUBLE BY 2020

"Ensuring that people living in low- and moderate-income communities are active participants in a national transition to clean energy is the only way to achieve the progress we need on climate change," she says.

With that in mind, UCS will seize every viable opportunity to promote broader access to solar and other renewables, for everyone in the United States. For her part, Garcia is passionate about spreading the benefits of solar to all.

"This is why I work in renewable energy," she says. {C}

Photo: © Jupiterimages/Getty Images

How Can Communities Build Climate Resilience?

By Erika Spanger-Siegfried

Many consequences of climate change, such as hotter temperatures and higher seas, have been irrevocably set into motion. Unless communities take aggressive steps now to increase their resilience to these consequences, the damages and dangers will mount as the climate continues to change. And yet, while planners and politicians around the world feel the pressure to protect people from harm, they must do so in ways that do not also create harm—for example, by prioritizing the needs of wealthy waterfront property owners over those with few financial resources.

How can decision makers act swiftly, but with care? How can communities put their limited resources to best use in light of an uncertain future?

> ***UCS offers a set of guidelines to help decision makers prepare for climate change.***

This summer, UCS released a set of 15 principles designed to help guide decision makers and practitioners from the local to the federal level in building climate resilience. The principles are structured around three basic themes: science, equity, and what we call ambitious common sense. Here's a sampling:

Louisianans meet with a FEMA representative about concerns for their communities' future after Hurricane Katrina.

DECIDE WITH, NOT FOR

Communities or groups affected by climate preparedness decisions should be directly engaged in shaping those decisions. Local residents are best positioned to determine the actions that can improve their quality of life.

AIM FOR "ROBUST" DECISIONS

The climate is changing, but the precise nature of that change is unknown. Making decisions that produce favorable outcomes under a wide variety of conditions is a way to move forward despite that uncertainty. For example, a farmer in the Northeast could shift to planting crops that better tolerate both wet and dry conditions.

CONSIDER THE COSTS OF INACTION

Adaptation to climate change can be costly. But these expenses must be viewed against the mounting costs we will face down the road if we don't start preparing. The costs of investing in preparedness versus recovering from a disaster are striking even today: for cities along US coasts, one dollar spent proactively can save as much as four dollars on recovery.

As these adaptation principles are adopted by practitioners and decision makers in the months ahead, we plan to learn from their initial experiences and refine the principles if necessary. UCS hopes this document proves to be a useful tool as our resilience-building nation adapts and learns to live with a new climate reality. {C}

Erika Spanger-Siegfried *is a senior analyst in the UCS Climate and Energy Program. For the full list of 15 principles, visit* www.ucsusa.org/resilience_principles.

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