Union of Concerned Scientists

Catalyst

SPRING 2013

A REALISTIC PLAN FOR CURBING OIL USE

Also: America's Aging Coal Plants • The Reality of Sea Level Rise

Union of Concerned Scientists

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Wind Power's Potential Is Real

The fall 2012 Catalyst article on renewable energy ["Will Congress Take the Wind Out of Our Sails?", p. 7] . . . highlights propaganda issued by the American Wind Energy Association. . . . For example: "Wind capacity has tripled to more than 50,000 MW—enough to power nearly 13 million homes and retire 44 typical coal-fired plants." This would be wonderful if it were true, but the actual performance of wind turbines is closer to 30 percent of capacity, so the claim is theoretical, not actual, and therefore misleading.

Douglas Zweizig
Evansville, WI

The author responds:

The U.S. wind power fleet did have an average capacity factor of 34 percent in 2011 (that is, it generated about 34 percent of the maximum electricity it could produce if it operated at full power year-round). According to government data, U.S. wind capacity reached 50,000 megawatts (MW) last August. With a 34 percent capacity factor, wind would generate about 149 billion kilowatt-hours of electricity per year—roughly equivalent to 13 million homes using 11,500 kilowatt-hours of electricity (the national yearly average).

In 2009, U.S. coal-fired power plants had an average capacity factor of 64 percent, which means it takes 1.9 MW of wind to generate the same amount of electricity as one megawatt of coal. Thus, 50,000 MW of wind capacity could replace 26,563 MW of coal capacity—roughly equivalent to 44 typical 600 MW coal plants.

Steve Clemmer, director of research and analysis, UCS Climate and Energy Program

LEDs: As Green as Advertised?

I read your article about LED lightbulbs ["How It Works," Fall 2012, p. 13]. I have heard they have no mercury, but contain semiconductors and must be disposed of in the same way you would dispose of a computer. I see no mention of this on the packaging.

Bruce Skud
Newburyport, MA

The author responds:

All lighting technologies contain materials that can contaminate the environment if disposed of in landfills. A forthcoming study by Pacific Northwest National Laboratory found that light-emitting diode (LED), incandescent, and compact fluorescent lightbulbs (CFLs) contain elements such as antimony, chromium, copper, or zinc at levels high enough to qualify as hazardous waste in the state of California (which has regulations more stringent than the federal government's). That's why it's best to recycle used LED bulbs; contact the manufacturer or visit *www.earth911.com* to find recycling programs near you.

The study also concluded that electricity consumption is by far the largest contributor to a bulb's lifetime environmental impact. Because LED bulbs use about 75 percent less electricity than incandescents to produce the same amount of light, last about 12 to 25 times longer, and do not contain mercury like CFLs, they have the lowest environmental impact of the three main lighting technologies.

Heather Tuttle, editor

Back issues of *Catalyst* are available in PDF form on the UCS website at *www.ucsusa.org/publications/catalyst.*

Photo: © iStockphoto.com/BlackJack3D

PERSPECTIVE

Building a Climate-Resilient Nation

For a long time, scientists' projections about climate change were just pictures of what the future might look like depending on how much heat-trapping carbon dioxide our cars and power plants were emitting into the atmosphere. But now that those projections are becoming reality, the future is here—and it's not pretty.

Sea levels are rising, heat waves are becoming longer and more intense, and precipitation patterns are becoming more extreme, robbing us of rainfall when we need it and deluging us when it finally comes. Unfortunately, these changes are just the tip of the (melting) iceberg.

UCS is helping to ensure science shapes policies that anticipate climate change impacts such as sea level rise.

In confronting this reality, we don't have the luxury to be either reactive (in adapting to the changes already under way) or proactive (by cutting emissions to prevent climate change from getting worse). We have to be both. Some scientists and planners call this combination of adaptation and mitigation "resiliency." And America must become much more resilient in the coming decades.

The good news is that there are creative strategies for both adaptation and mitigation that are already being put to use across the country. At least 13 states, for example, have developed climate adaptation plans that could better protect residents during extreme weather such as heat waves and floods, and scores of mayors have factored climate change into their plans for new roads, buildings, and waterways so they will be less susceptible to damage from extreme weather. To help replicate these efforts elsewhere, UCS is connecting scientists with city planners and government officials to help shape policies that anticipate climate change impacts such as sea level rise (see "Newsroom," p. 4, for an example).

At the same time, we're pushing for solutions that can accomplish adaptation and mitigation simultaneously: "smart grid" technology, for example, would allow utilities to better maintain or restore electric service after a storm, while enabling residential and business customers to monitor and reduce their electricity consumption. Reducing consumption will be critical for avoiding brownouts and blackouts during increasingly hot summer months, when electricity demand is at its highest.

On several occasions since his reelection, President Obama has called for a national conversation about climate change. We will help drive this conversation and push for creative solutions that ensure everyone, from family farmers to corporate executives, has the information they need to prepare for life in a warmer climate—and to make smart decisions that will preserve a safer climate for future generations.

—***Kevin Knobloch**, president*

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Photos: Photos: © Richard Howard (Kevin Knobloch); © iStockphoto.com/bsauter (coal)

Sea level rise is causing chronic flooding in Florida's coastal cities.

On the Front Lines of Climate Change

UCS partners with Floridians confronting sea level rise

In few places around the world are the effects of climate change more clearly visible than south Florida. Sea level has risen more than eight inches along the state's coast—enough to damage roads and beachfront resorts. The city of Hallandale Beach, just north of Miami, has even been forced to spend $10 million to drill new wells for drinking water after saltwater seeped into six of its wells.

The threat facing Florida is not unique: sea levels along the northeastern United States' Atlantic coast have recently risen at a rate three to four times faster than the global average. Yet as low-lying communities across the country struggle to adapt, opponents in Congress continue to block action on climate change and local governments have been offered little financial help. UCS is putting its muscle behind efforts to illustrate the dilemma facing coastal states by focusing attention on Florida's plight in particular.

In the build-up to the presidential election last fall, voters heard little to nothing from the candidates about climate change. Even in Florida, site of the third and final debate and a wealth of electoral votes, neither President Obama nor Mitt Romney addressed the subject.

Working to change that, UCS helped organize a letter urging the presidential candidates to discuss their plans for dealing with sea level rise in Florida. We circulated the letter to our Science Network members in the state and, with the help of allies, collected the signatures of more than 100 scientists, mayors, commissioners, and other city and county officials from more than a dozen Florida municipalities.

UCS will continue to engage Florida's residents about the threat posed by a warmer climate and what they can do about it.

On October 11, national media outlets including the *CBS Evening News*, *Mother Jones*, and *Scientific American* as well as local outlets such as Florida Public Radio, the *Miami Herald*, *South Florida Sun Sentinel*, and *Naples Daily News* cited the letter's description of a threat projected to cost Florida tens of billions of dollars in the coming years. The *Miami Herald* story quoted UCS Outreach Associate Chrissy Elles, who participated in a press conference in Miami Beach while standing barefoot in ankle-deep water on a city sidewalk—a fact of life likely to become more common for residents forced to face the reality of rising sea levels. The press conference was timed to coincide with an extreme seasonal high tide, which caused seawater to back up into storm drains and flood city streets. In the past, such flooding would only have occurred during a major storm.

In recent speeches culminating in his State of the Union address, President Obama has vowed to take action to reduce the heat-trapping emissions that lead to sea level rise. UCS will continue to engage Florida's residents about the threat posed by a warmer climate and what they can do about it—not just by adapting to the changes that are already happening but by pushing their legislators to take action and prevent even worse changes. And we will continue to publicize Florida's story, as well as those of communities in other states whose coasts are rapidly changing. We also plan to work with local officials and scientists to apply the lessons learned from Hurricane Sandy (and Katrina before that) in preparing for damaging storm surges in this era of rising seas.

Photo: Nicole Hernandez Hammer

A Manufactured Climate Controversy Muted

We turned attention back to the facts

Public acceptance of climate change dipped two years ago when climate contrarians used stolen emails from scientists to generate controversy and misinformation about global warming. Only 47 percent of Americans in early 2011 agreed that global warming is happening and caused by human activities, according to polling from Yale and George Mason University.

UCS countered by launching the Weight of the Evidence campaign, which, by helping climate scientists communicate their research more effectively to the media, would bring renewed attention to global warming and expand the public's understanding of its causes and solutions. We conducted workshops for nearly 100 scientists, many of whom have since developed fruitful relationships with both local and national journalists.

We also brought scientists, business leaders, and city planners together in the wake of extreme weather to explain the role climate change plays in such events and the actions needed to better protect communities. For example, we highlighted research showing the threat heat waves pose to high school football players; this played a role in Texas and Georgia's decisions to implement new rules to protect athletes.

Thanks in part to our work, public acceptance of human-caused climate change had risen to 54 percent last fall, and 74 percent of Americans now recognize that climate change is making extreme weather worse. We are committed to driving these numbers higher still, and translating awareness into action.

UCS Press Secretary Eric Bontrager (standing) helps scientists distill the main messages of their research at an October 2011 communications workshop in Los Angeles.

Photo: Miriam Swaffer

Keep Your Finger on *The Pulse*

For the latest news and views from UCS

A free subscription to our monthly email newsletter, *The Pulse,* will keep you up to date on the issues you care about. In it you'll find:

- "Got Science?"—a new column that calls out misinformation and highlights the power of decisions based on scientific evidence
- Links to the most recent UCS publications
- Responses from UCS experts to your questions
- Ways for you to get involved and take action

If you're not already receiving *The Pulse*, visit *www.ucsusa.org/pulse* today.

An Easy Way to Support UCS

Your normal expenses can translate into donations

UCS is proud to once again be one of 40 nonprofits selected to receive donations through CREDO, a telecommunications and credit card company that supports social change. Every year CREDO's customers nominate organizations to receive funding, then vote throughout the year on which are most deserving. The company will donate 1 percent of its members' monthly charges—which amounted to more than $2.7 million in 2011—to these organizations, based on the number of votes each receives.

If you are already a CREDO member, please consider voting for UCS at *http://act.credoaction.com/voting*; the more votes we get, the more funds we receive. To learn more about CREDO visit *www.credomobile.com*.

LET'S CUT OIL USE NOW

We have the solutions at hand to cut projected U.S. oil use in half in 20 years. What's missing are enough politicians willing to make it happen.

By Matt Heid

UCS has a practical, realistic plan to protect consumers, communities, and our nation from the growing costs of our oil use. It all comes down to one simple fact: we need to use less oil.

Our Half the Oil plan outlines a suite of oil-saving solutions that scientists and engineers have already developed and are improving every day. Among them are technologies that make cars and trucks more efficient, hybrid and electric vehicles more practical, and vehicle fuels less polluting.

David Friedman, senior engineer and deputy director of the UCS Clean Vehicles Program, knows from firsthand experience that these changes are possible. In many ways, the Half the Oil plan began with a historic success more than six years ago—one he and UCS helped secure.

A Step in the Right Direction

In May 2007, in a brightly lit room near the U.S. Capitol, David faced some of the most powerful policy makers in the country: members of the Senate Commerce Committee conducting a hearing on proposed standards that would increase vehicle fuel economy. And they wanted to hear what David had to say. His response was clear: We already have the technologies to make our cars and trucks go dramatically farther on a gallon of gas, which would significantly reduce U.S. oil use, save consumers billions at the pump, and lower global warming pollution (oil and other petroleum products are the United States' largest source of heat-trapping emissions).

Representatives of the auto industry who were sitting next to David tried to convince the senators otherwise. As he recalls, "They weren't telling the truth about the potential of their companies to make their cars better. I realized I had to call them out." So he did, and Congress listened. Later that year, it raised fuel economy standards for the first time in three decades, requiring that new cars and light trucks achieve an average of 35 miles per gallon (mpg) by 2020.

How We Get All the Way There

"That victory was a first step," David says, "but to effectively address global warming we need to achieve even greater savings in the years to come. What's really inspiring, though, is that

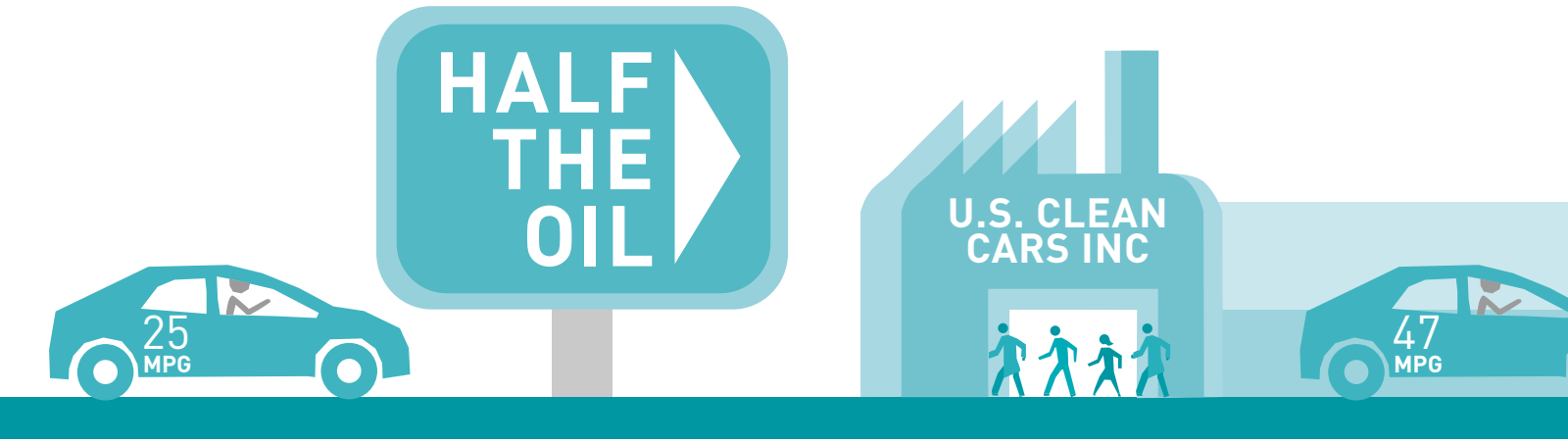


Photo: iStockphoto.com/Stefan Redel (gas pump); Illustration adapted from Urban Matter Inc

there are so many more opportunities to cut our oil use." That insight led David and other UCS experts to undertake a broader analysis of oil-saving solutions that could realistically be implemented over the next two decades.

UCS found that cutting projected U.S. oil use in half will require saving 11 million barrels per day by 2035 compared with a future in which America does nothing to reduce its oil use. While about one-third of these savings can come from homes, businesses, and additional transportation options (see the sidebar, p. 8), the majority would result from advancements in vehicles and fuels, including:

(Further) improving vehicle fuel economy. Even after the 2007 standards were finalized, David explains, "The science showed that cars could do even better." So UCS worked with the Obama administration, the Department of Transportation, and the Environmental Protection Agency to help shape new standards, finalized last year, that require automakers to nearly double the average fuel economy of new cars and light trucks sold in 2025. About a third of our needed oil savings will be accomplished as a result.

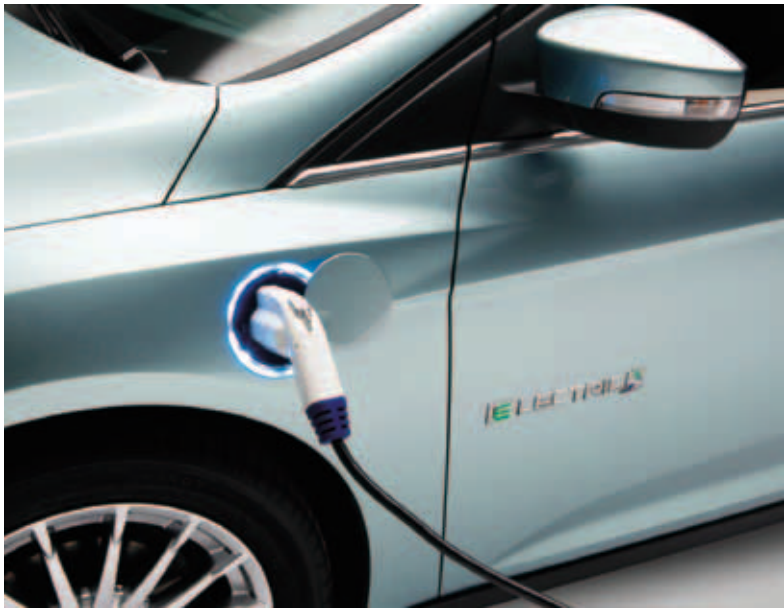
> **What's really inspiring is that there are so many opportunities to cut our oil use.**

The same technologies used to improve car and light-truck fuel economy—such as more efficient engine designs, stronger but lighter materials, and hybrid-electric power trains—can also be applied to other vehicle fleets. Consider commercial vehicles such as big rigs, delivery trucks, and buses, which comprise only 4 percent of the U.S. vehicle fleet yet consume 20 percent of our fuel. Doubling their fuel efficiency by 2030 would save 1 million barrels per day by 2035. Increasing the efficiency of planes, trains, and ships would save an additional half-million barrels per day.

Expanding the electric vehicle (EV) market. By using virtually no oil at all, EVs offer tremendous potential to help achieve the Half the Oil plan. If steady market growth leads to between 35 and 40 percent of all new vehicles sold in 2035 running almost entirely on battery power or hydrogen fuel cells, the resulting oil savings would total 1.5 million barrels per day.

EVs currently make up less than 1 percent of new vehicles sold each year, but that number is likely to change quickly—sales of EVs tripled in 2012, outpacing the adoption rate of hybrid-electric cars in their first few years on the market. "Over time, if we invest in innovation and increase the number of electric cars on the road, the cost of EVs will go down, their performance and range will steadily increase, and we'll see them as another good option for going about our daily lives," David says.

Developing better, cleaner biofuels. Corn ethanol and other food-based biofuels put pressure on food supplies and, because their production uses large amounts of land and fossil fuels, do little to reduce global warming emissions. However,



Increased adoption of electric vehicles could reduce U.S. oil consumption as much as 1.5 million barrels per day by 2035.

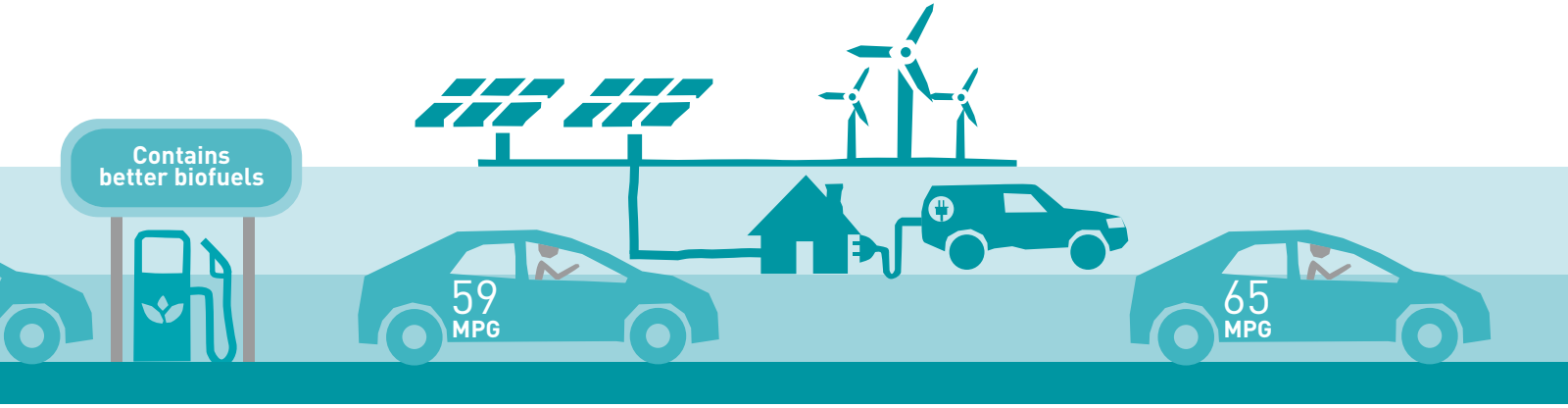


Photo: © Ford Motor Company

Smart planning can make it easier for people to get around without a car.

Saving Oil When We're Not Driving

Our plan identifies smarter ways to do business, stay warm, and get around town.

We typically associate oil use with cars and trucks, but some 25 percent of the oil we use goes toward making goods, powering industries, and providing heat to homes and businesses (nearly 7 million households—mostly in the Northeast—use oil for heat). By retrofitting buildings to use less energy, making boilers more efficient, recycling oil and plastics, and adopting substitutes for oil to heat our homes and manufacture goods, we could reduce oil consumption by around 2 million barrels per day. Many homeowners and industries have voluntarily moved in this direction in the face of rising energy costs, but energy efficiency standards, tax incentives, and funding for oil alternatives would help get us where we need to go.

Another important oil-saving strategy is to better integrate transportation options with the places where we live and work. For example, improving public transit systems and increasing mixed-use development would reduce the need to get behind the wheel for daily commuting or errands. And smart road design would allow bicycles and pedestrians to better share the road with cars and trucks. These and related strategies could yield oil savings of nearly 1.5 million barrels of oil per day by 2035.

cellulosic biofuels (so named for the sugars in plant cell walls) largely avoid these problems because they can be made from perennial grasses, agricultural residues left behind after harvesting, and even garbage.

Production of cellulosic biofuels—if done in a sustainable way—has the potential to displace enough gasoline to save more than 1.5 million barrels of oil per day by 2035. A small but growing number of U.S. facilities are already producing these fuels; policies that support greater investment in large-scale commercial production are needed.

The costs of our oil use—from high gas prices to global warming—are too great to continue on our present path.

Building the Political Will

Developing a plan to cut oil use is one thing. Making it a reality is another thing entirely. "I realized early on that there is a massive gap between what policy makers thought was possible, and what scientists and engineers were saying could and should be done," David notes. "If we want to make progress, it's essential that we bridge that gap." And that is what UCS, together with its thousands of members and supporters, is working toward every day.

Implementing practical, realistic solutions like the Half the Oil plan is essential to creating a healthier, safer, and more sustainable future, but it won't be easy. "We've got to be real," David says. "The political will is lacking for a reason. There's a huge industry out there that's making a lot of money selling us oil—and it is going to actively fight any attempts to reduce demand for its product. But the costs of our oil use—from high gas prices and pollution to the growing dangers of global warming—are simply too great to continue on our present path."

Fortunately, as David demonstrated six years ago in Washington, DC, resistance can be overcome. UCS will continue to push for the many economic, security, environmental, and public health benefits of our Half the Oil plan while we fight the oil industry's efforts to block progress. With a national commitment to reducing oil use, we could be well on our way to a cleaner, lower-carbon energy future.

*UCS Web Content Manager **Matt Heid** writes on climate, energy, and transportation issues.*

Visit *www.halftheoil.org* to learn more about our oil savings plan and what you can do to be a part of the solution.

Photo: Travel Portland

Ripe for Retirement

Coal-fired power plants are bad for the environment and our health, and many don't make economic sense either. UCS identifies which ones should be considered for closure.

By Jeff Deyette and Steven Frenkel

Michigan's St. Clair power plant has provided electricity for families and businesses north of Detroit for decades—its six coal-fired generating units have far exceeded their expected 30-year life span. Like many other aging coal plants across the United States, St. Clair's generating units lack modern pollution controls needed to limit air emissions. That means St. Clair has been endangering the health and environment of local residents for generations, with sulfur dioxide that causes acid rain, nitrogen oxides that cause smog, mercury that poisons waterways and fish and causes neurological damage in children, and soot that causes asthma attacks, lung disease, and premature death.

Old and dirty coal plants like St. Clair face an increasingly uncertain economic future. Growing competition from cheaper, cleaner, abundant, and reliable energy sources (such as natural gas, renewable energy from the wind and sun, or energy efficiency measures that reduce electricity use) makes it harder for coal plants to produce power economically. Moreover, long-awaited federal clean air rules will now require coal plants to reduce toxic emissions.

St. Clair's owner, Detroit Edison, faces a critical decision: it can either pay for costly upgrades to keep its outdated coal-fired generators running and pass the costs on to its customers, or retire them and invest in cleaner, lower-cost options. Detroit Edison is not alone; owners of hundreds of U.S. coal plants are making the same calculations. As of May 2012, 288 coal-fired generating units totaling more than 41 gigawatts (GW) of capacity—12 percent of the U.S. coal fleet—have been judged a bad investment by their owners and scheduled for closure. This is a positive step toward a cleaner energy future. But how many more uncompetitive units are still out there? Quite a few, as our report *Ripe for Retirement* found.

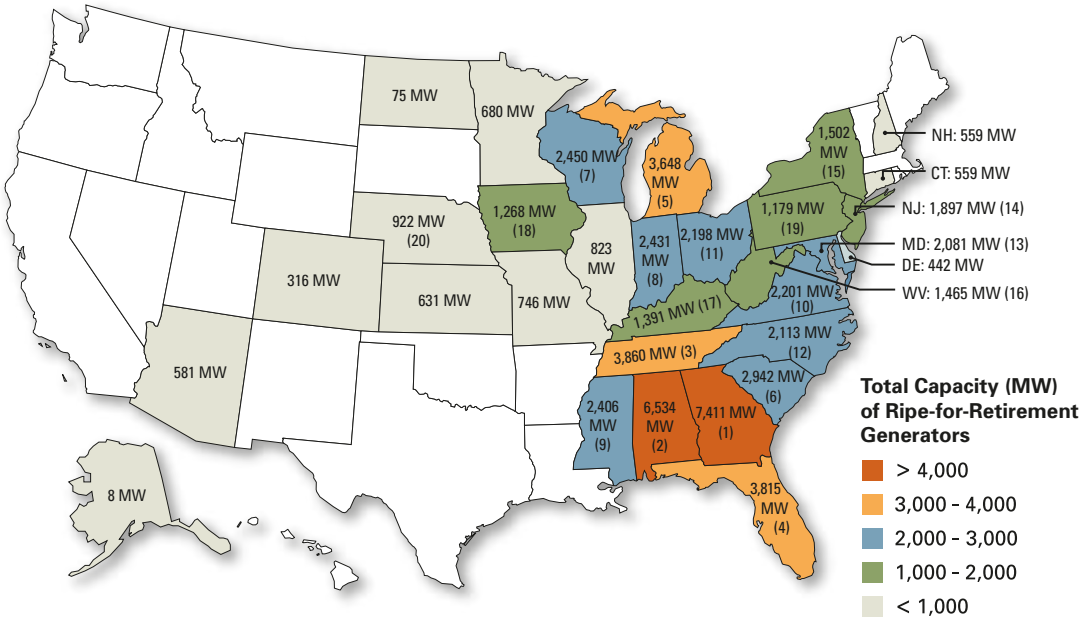
How many uncompetitive coal generators are out there? Quite a few, as UCS found.

Photo: © Flickr/squeaks2569 (background)

Ripe-for-Retirement Generating Capacity

The vast majority of economically uncompetitive coal generators are located in the eastern United States; Georgia leads the nation with nearly 7,500 megawatts (MW) of capacity that is ripe for retirement.

Totals listed do not include announced retirements. Rankings for top 20 states are given in parentheses.



Hundreds Fail the Test

Our analysis, released in November, calculated the cost of electricity from individual generating units within the remaining U.S. coal fleet and compared it with the cost of electricity from cleaner options. We estimated the cost of modernizing the coal fleet to protect public health and the environment by installing the most effective technologies available to control four major air pollutants: sulfur dioxide, nitrogen oxides, mercury, and particulate matter (or soot). If, after factoring in the cost of installing any missing pollution controls, a coal-fired generator would be more expensive to operate than an efficient natural gas combined-cycle plant or wind power facility, we considered that generator a good candidate for closure—or "ripe for retirement."

Not surprisingly, these older, inefficient generators are among our nation's dirtiest power sources.

We found that 353 coal generators (in addition to those already scheduled for closure) are ripe for retirement, representing 59 GW of capacity—equivalent to nearly 18 percent of the existing U.S. coal fleet. These generators are located in 31 states, but most are concentrated in the eastern half of the country (see the map above).

Georgia, for example, is home to the largest amount of uncompetitive generating capacity. Two months after *Ripe for Retirement* was published, Georgia Power—the largest utility in the state—announced that it will retire 15 coal-fired units, all of which were identified in our report.

Michigan has the greatest number of ripe-for-retirement coal generators: 39, including five of St. Clair's six. The St. Clair generator that passed our initial economic test failed when we took into account the cost of limiting carbon dioxide (CO_2) emissions, the main contributor to global warming (see the sidebar, p. 12). Given their higher costs compared with cleaner, more affordable options, all the ripe-for-retirement generators on our list should be subject to rigorous review before their owners invest in any upgrades.

As a cautionary tale, consider the Merrimack Station coal plant, owned by Public Service of New Hampshire (PSNH). In 2009, PSNH opted to spend $422 million upgrading two 1960s-era generating units rather than shutting them down. But now, despite the costly upgrade, PSNH has announced it will idle Merrimack for months at a time because it costs substantially more to run the plant than to buy electricity from cleaner-burning natural gas plants elsewhere in New England. Unfortunately, PSNH customers must continue to foot the

Five of the six coal generators at the St. Clair plant in Michigan are no longer economically competitive compared with cleaner energy options such as wind and natural gas.

Photo: © Wikimedia Commons/Cgord

The nation's electricity system is well prepared to retire coal plants while continuing to provide reliable, affordable power.

bill for Merrimack's costly retrofit—even when the plant is not running.

Clean, Reliable Power

Our analysis found that ripe-for-retirement generators were 45 years old, on average. Some, like those at St. Clair, are considerably older than that. Not surprisingly, these older, inefficient generators are among our nation's dirtiest power sources. Shutting down all 353 could avoid approximately 1.3 million tons of sulfur dioxide and 300,000 tons of nitrogen oxide emissions each year, as well as significant amounts of mercury, particulates, and other toxic emissions (depending on the type of resources that replace them). It would also keep 260 million tons of CO_2 out of the atmosphere each year—a more than 10 percent reduction in 2010 U.S. power sector global warming emissions (assuming they are replaced entirely with zero-emissions resources like wind, solar, and energy efficiency).

Of course, retiring and replacing all 100 GW of uncompetitive coal generators (i.e., already announced closures plus those we identify as ripe for retirement) will be a big task. But our analysis shows that the nation's electricity system is well prepared to meet this challenge *and* continue providing reliable, affordable power. For example, power grid operators project that the United States will have 146 GW of excess

Replacing retired coal generation with renewable energy would enable a quicker transition to a low-carbon electricity system.

Cleaner Energy Can Replace Coal Retirements by 2020

State-level clean energy policies and underused natural gas plants can replace power currently supplied by ripe-for-retirement generators and announced retirements.

The eight regions in this chart correspond to regional entities that maintain and improve the reliability of the U.S. electricity grid.

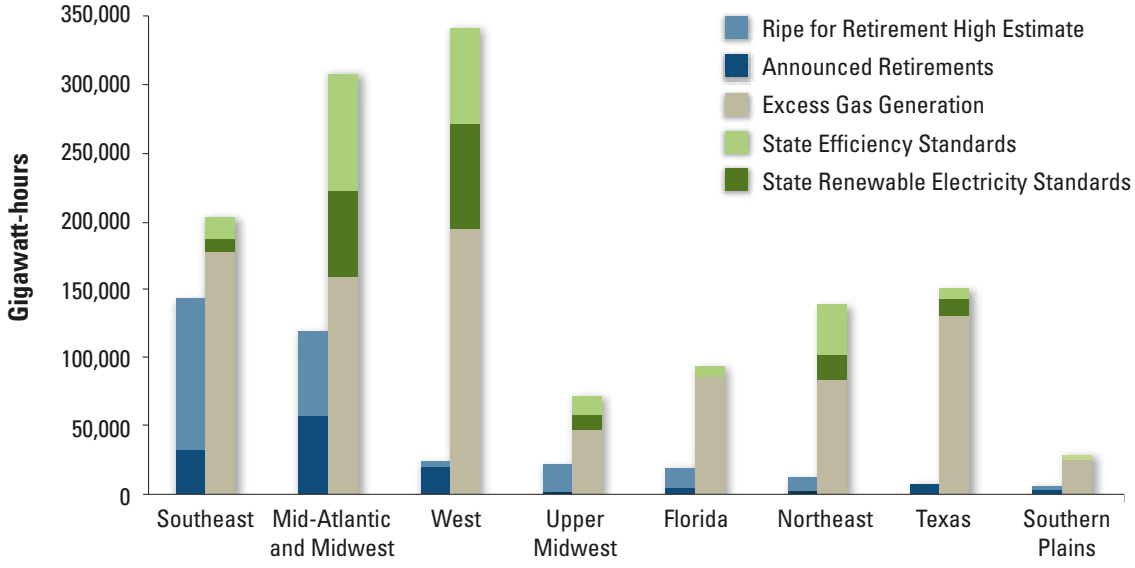


Photo: © iStockphoto.com

Coal-fired power plants are a major source of global warming emissions.

What about the Cost of Carbon?

Future CO_2 regulations could make coal even less economical.

Coal-fired power plants are the United States' single largest source of heat-trapping CO_2 emissions. Closing ripe-for-retirement plants would help address this problem, but we would still be left with more than 200 GW of coal-fired generating capacity that could continue warming the atmosphere for years. With the health and economic risks of unchecked climate change becoming increasingly clear, policy makers should take action by putting a price on CO_2 emissions.

To measure the effect of such a policy, we evaluated the cost of coal-fired power generation under a scenario in which CO_2 emissions are priced at $15 per ton (a conservative figure used in economic analyses by government agencies and other energy experts). This price would nearly double the generating capacity we found to be ripe for retirement: from 59 GW to 115 GW. If that additional capacity were retired, annual CO_2 emissions would be reduced between 348 million and 584 million tons (equivalent to 14 to 23 percent of 2010 U.S. power sector emissions), depending on the mix of energy technologies that replace it.

With these costs in mind, making expensive upgrades to the remaining coal fleet should be considered financially risky. A better deal for electricity customers would be investing in cleaner, low- or no-carbon alternatives.

generating capacity by 2014, so many coal plants can retire without needing to be replaced at all. In addition, the United States has a significant number of underused natural gas plants that, if further utilized and combined with growth in renewable energy and energy efficiency spurred by state-level policies, would more than make up for all coal generator retirements by 2020 (see the chart, p. 11). Investments in new transmission lines that bring renewable energy to market, along with a limited number of new natural gas power plants, would also help us transition to a cleaner energy system.

Because the energy choices we make today profoundly affect how quickly and efficiently we can shift to cleaner sources, careful planning is needed *now* to ensure we create a sustainable, reliable, and affordable energy system while we retire old coal plants.

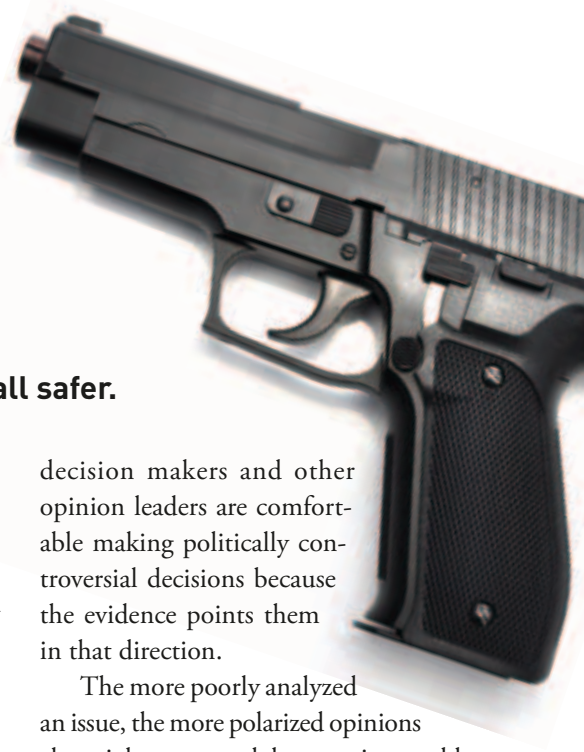
The writing is on the wall: our nation's coal fleet is becoming outdated and unaffordable. Because the energy choices we make today profoundly affect how quickly and efficiently we can shift to cleaner sources, careful planning is needed *now* to ensure we create a sustainable, reliable, and affordable energy system while we retire old coal plants. Simply shifting from coal to natural gas, for example, would represent a huge missed opportunity to transition to truly low- or no-carbon resources that protect public health, have less impact on the environment, and achieve the CO_2 reductions necessary to avoid global warming's worst consequences.

Federal, state, and regional policies are needed to achieve this transition at the lowest possible cost and with the greatest benefits to society. Closing ripe-for-retirement coal plants and replacing them primarily with renewable energy and energy efficiency is a good start.

***Jeff Deyette** is assistant director for energy research in the UCS Climate and Energy Program. **Steven Frenkel** is director of the UCS Midwest office. Read more from Jeff on our blog,* The Equation, *at* http://blog.ucsusa.org.

Visit the UCS website at *www.ucsusa.org/ripeforretirement* to learn more about how closing America's costliest coal plants would benefit our health, environment, and economy.

What Does Gun Violence Have to Do with Science?



Americans are being deprived of research that could make us all safer.

By Michael Halpern

In the wake of several high-profile mass killings, the ongoing epidemic of gun violence in the United States took center stage this past winter. But what initially received scant attention in the growing public discussion was the fact that Congress has discouraged scientific research on gun violence that could lead to effective solutions.

In 2004, the National Academy of Sciences identified several significant gaps in policy-relevant gun violence research. But incredibly, this research has been effectively shut down for political purposes. For years, government scientists employed by the Centers for Disease Control and Prevention (CDC)—and even scientists who receive funding from government entities like the National Institutes of Health (NIH)—have raised concerns about the effect that legislation passed by Congress has on their ability to conduct gun violence studies.

Even if such studies were embraced by Congress, good, usable data would be hard to come by: employees of the Bureau of Alcohol, Tobacco, and Firearms, for example, are not allowed to enter gun ownership information into computers—information that would help them more quickly trace the source of weapons used in crimes, and enable researchers to see trends.

The good news is that a thaw may be coming. In January, President Obama directed the CDC to conduct this crucially needed research. As the president was considering what to do, UCS helped inject the problem into the public conversation through an op-ed for *CNN.com* and a number of interviews with news outlets including National Public Radio and the Associated Press. We suggested that to make meaningful progress in preventing gun-related deaths and injuries, the United States must pursue high-quality scientific research on issues such as violence prevention and mental health, while creating opportunities for more public discussions that consider this research.

Every Debate Requires Facts

Robust research establishes a foundation for reasoned discussion and enables us to make the best decisions for society as a whole. In the process, the partnerships that form among scientists, policy makers, and the public help us deal with critical challenges effectively, even after events like the recent mass shootings fall out of the headlines.

These are the kinds of discussions the Center for Science and Democracy at UCS is fostering on issues that affect our lives. We are working to build better connections between scientists and citizens so that the best available scientific information is shared and not easily ignored when making decisions. We are also seeking to create an environment in which decision makers and other opinion leaders are comfortable making politically controversial decisions because the evidence points them in that direction.

The more poorly analyzed an issue, the more polarized opinions about it become, and the more intractable the problem becomes. In the absence of reliable information on which we can all agree, we guess. We interpret the facts to suit our beliefs and continue talking past each other. While the Center for Science and Democracy does not work extensively on the issue of gun violence, we will weigh in on this and any issue whenever politicians or special interests seek to suppress science that can improve the health and safety of all Americans.

***Michael Halpern** is program manager for the Center for Science and Democracy at UCS.*

Visit *www.ucsusa.org/gunviolence* to learn more.

Are Research Dollars Going Where They Will Do the Most Good?

Condition	U.S. Cases (1973–2012)	NIH Research Awards (1973–2012)
Cholera	400	212
Diphtheria	1,337	56
Polio	266	129
Rabies	65	89
Total of four diseases	*2,068*	*486*
Firearm injuries	**>4,000,000**	**3**

Restrictions on gun violence research lead to few research grants and applications for grants.

Photo: © iStockphoto.com/susaro

A New Direction in Food and Agriculture

Ricardo Salvador joined UCS last year as director of our Food and Environment Program. He received a Ph.D. in crop production and physiology from Iowa State University in 1988, after which he conducted some of the initial academic research on "community-supported agriculture" (in which consumers buy shares of their local farmers' harvests). He also served as program officer for the W.K. Kellogg Foundation, helping to create programs that address the connections between food and health, environment, economic development, and social justice.

Ricardo recently spoke with Senior Staff Writer Seth Shulman and Editor Heather Tuttle about his vision for the future of agriculture.

What sparked your interest in the physiology of corn?

I grew up in southern Mexico. Corn is central to our diets, history, and culture there, so when I went to graduate school it was the single crop I was interested in studying. I got so deep into my understanding of corn that I could practically tell you what it feels like to be a corn plant.

Did these studies spark your interest in food-related issues?

Actually, my interest began when I was very young. My mom, a German-American, had relatives who were very successful farmers in California. My father is Native American, a Zapotec, and his relatives are self-provisioning farmers who are very poor. I saw that my dad's folks were hard-working, ambitious, and very smart, but just didn't have opportunity. These structural issues fueled an abiding concern in me for what is fair and right. And from the start, food and the environment were the ways all these issues connected to one another for me.

How do you envision UCS addressing these issues?

It might sound grandiose, but I see building an equitable food system as a way to address crucial issues about humanity's fate on the planet. I am very excited to work at an organization that is clear about having a mission like that—I feel like everything I have done in my life, from my work in academia to my more recent work in philanthropy, has prepared me to be a part of this organization.

One of the things I want to do is make sure we are connecting agricultural issues to people's lives. For example, there are huge public health care costs associated with diseases like hypertension and diabetes. These largely preventable diseases are primarily the result of a food system that benefits some large companies but remains deaf to its effects on our health. Because our food system depends on public investment, it should be about healthy environment, healthy food, and well-being for all of us, not just agribusiness.

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U.S. farm policy seems to have created more problems for sustainable agriculture than it has solved. What do you see as the priority for improvement?

We will be focusing on reversing policies that incentivize too much production of the wrong stuff (grain and meat) and not enough production of the right stuff (fruits and vegetables). These encompass direct government payments as well as insurance programs and access to credit. There's plenty of work to do but, despite the urgency, we see this not as a sprint but a long-distance race.

Which suits you because you're a marathoner?

I've loved running since I was 12 and my goal is to always be in marathon shape. I run five days per week—as many as 16 miles before work—and come in energized, happy, and ready for action.

Photo: © Richard Howard

Setting an Example, Leaving a Mark

When you meet Dr. Frances Lamberts, you know you're in the company of an environmental Renaissance woman. A retired psychologist, Frances is well known in Tennessee as a conservation leader, community educator, and trailblazer of low-carbon living. Visit her hometown of Jonesborough and you will see her impact, in the form of a butterfly garden and a public arboretum focused on native plants—two projects she spearheaded.

> **"UCS's reliable science has been a great resource to me."**

An active UCS member for nearly 30 years, Frances supports the organization through our Partners for the Earth monthly giving program. "I draw regularly on the scientific expertise of UCS so I like reciprocating," she explains. During her 25-year tenure as conservation chair of the League of Women Voters, she regularly used our reports and recommendations to support the League's work in curbing climate change, protecting natural resources, reducing nuclear risks, and expanding clean energy development. "UCS's reliable science has been a great resource to me," she says, informing her legislative advocacy, testimony at public hearings, and the "Eye on the Environment" column she writes for her local newspaper.

Photo: © Charlie Mauk/Jonesborough Herald & Tribune

A Self-Made, Sustainable Eden

Frances has also transformed her life into a model of sustainability. More than a decade ago, she retrofitted her house to use less energy and added a solar water heating system—improvements that earned her an "Energy Efficiency Champion" award from the Southern Alliance for Clean Energy. The raised-bed organic gardens, ducks and sheep, and more than 150 native trees and shrubs on her acre of land—her paradise, as she calls it—produce most of the food she eats. Through these efforts and more, Frances has inspired many others in her community to reduce their environmental impact as well.

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Member of EarthShare

THE IRA CHARITABLE ROLLOVER IS BACK FOR 2013!

If you have savings in an individual retirement account (IRA), you can use it to support UCS while reducing your tax liability.

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The American Taxpayer Relief Act of 2012, passed by Congress on January 1, 2013, allows you to make tax-free charitable distributions of up to $100,000 from traditional IRAs and Roth IRAs.

To take advantage of this opportunity you must:

- be at least 70 ½ years old
- make the gift before December 31, 2013, when the provision is scheduled to expire

As you know, retirement plan assets are typically subject to a heavy tax burden. If you have saved tax-deferred income in an IRA and are currently required to take distributions, any amount you donate directly to UCS will count toward your minimum required distribution. It is an easy, tax-free way to help advance our work on some of the most critical environmental, security, and health issues of our time.

For more information about IRA gifts, please visit the UCS website at *www.ucsusa.org/IRArollover*, or contact John Mace at (800) 666-8276 or *jmace@ucsusa.org*.