

The Climate and Energy State of the Union

Ronald Bailey February 15, 2013

In his State of the Union speech, President Barack Obama warned that Americans must take steps now to cut "our emissions of the dangerous carbon pollution that threatens our planet." To justify these efforts, he appealed to the "overwhelming judgment of science," pointing chiefly to recent weather extremes in the United States as evidence for the urgency of action. Skeptics "can choose to believe that Superstorm Sandy, and the most severe drought in decades, and the worst wildfires some states have ever seen were all just a freak coincidence," Obama announced, but the president clearly does not. "Heat waves, droughts, wildfires, floods—all are now more frequent and more intense."

Is he right? Let's take a closer look at those trends the president cites. After that, we can assess the he wants to implement as a response.

Heat, Drought, Fires, and Floods

Let's start, as Obama did, with heat waves. According to the National Oceanic and Atmospheric Administration, last year was the hottest year since 1895 for the contiguous United States, about 3.2 degrees Fahrenheit above the 20th century average. Globally, 2012 was the tenth warmest year on record, and all 12 years to date in the 21st century rank among the 14 warmest since 1880. On the other hand, the Environmental Protection Agency's Heat Wave Index from 1895 to 2011 shows that the frequency and breadth of heat waves in the lower 48 states were dramatically more severe in the 1930s than at any other time in the historical record, although there has been an uptick in recent years. A study in the January 2013 issue of *Climatic Change*, analyzing trends in monthly mean temperatures around the globe since the 1880s, reports that "the number of record-breaking heat extremes has on average increased to roughly 5 times the number expected in a climate with no long-term warming."

With regard to droughts, the Palmer Drought Severity Index for the continental U.S. reveals that the 1930s and 1950s saw the most widespread droughts since the record begins in 1895; the last 50 years have generally been wetter than average. In 1934 about 80 percent of the lower 48 experienced drought. The next worst years were 1954 and 2012, when more than 60 percent of the contiguous U.S. suffered drought. The most recent data show that the drought in the middle section of the country has not yet abated. Interestingly, even as average global temperatures have increased, a study published in *Nature* in November 2012 argued that the index overestimated the increase in global drought and that "there has been little change in drought over the past 60 years."

Last year was America's third biggest year for wildfires since 1960, with just 2006 and 2007 coming out ahead. Each of those years saw more than 9 million acres burn, according to data from the National Interagency Fire Center (NIFC). Between 1960 and 2000, an average of about 3.7 million acres of wildlands burned every year. Since 2000, the average has been about 7 million acres. In the 1930s, by contrast, about 40 to 50 million acres of wildlands burned annually, dropping below 10 million acres by the mid-1950s. (It's hard to get good data on the trends prior to the '30s.) The 52-year average of the NIFC data is 4.5 million acres per year, so the area burned by wildfires each year has declined by more 90 percent since the 1930s. Still, the current trajectory doesn't look good: In December NASA researchers reported that climate models project that "high fire years like 2012 would likely occur two to four times per decade by mid-century, instead of once per decade under current climate conditions."

What about flooding? A 2011 study by the U.S. Geological Survey looked at data from stream gauges collected over the past 127 years in four regions of the U.S. The hydrologists found no "strong statistical evidence for flood magnitudes increasing" with carbon dioxide. The EPA does report that precipitation in the lower 48 is increasing at a rate of 5.9 percent per century. The EPA also notes, drawing on data from 1910 and 2011, that extreme precipitation events (defined as being in the top 10 percent of one-day events) over the conterminous U.S. states are also increasing. Other studies find that the frequency of extreme precipitation events is also increasing globally.

As noted above, Obama also invoked Superstorm Sandy as evidence of dangerous man-made climatic trends. Sandy was especially disastrous because it combined with a snowstorm and came ashore when the local tides were running high. But is Sandy evidence of worsening global hurricane trends? It's worth recalling the reason that Sandy was dubbed a "superstorm": It was no longer a hurricane when it hit the northeastern United States. In his 2011 article for *Geophysical Research Letters*, "Recent Historically Low Global Tropical Cyclone Activity," the atmospheric scientist Ryan Maue reports that accumulated cyclone energy (ACE) has recently been at a 40-year low.

ACE measures each tropical storm's wind energy. Even though Sandy was a monster storm, the North Atlantic ACE measure for 2012 was the 20th highest out of the last 62 years. Less happily, climate

computer models project that future warming will likely cause hurricanes globally to increase in average intensity by between 2 to 11 percent.

On balance, then, currently available scientific evidence indicates that heat waves and wildfires in the U.S. have increased in recent years. On the other hand, there appear to be no strong trends for droughts, floods, and hurricanes in the continental United States. However, most climate computer models suggest that all of these aspects of climate will get worse as the century unfolds.

Carbon Rationing and a Slew of Subsidies

After Obama gestured toward the evidence for man-made global warming, he declared, "The good news is we can make meaningful progress on this issue while driving strong economic growth." In a nod towards climate change bipartisanship, the president mentioned the "market-based solution to climate change, like the one John McCain and Joe Lieberman worked on together a few years ago." That bill was a cap-and-trade scheme that aimed to push carbon dioxide emissions to sixty percent below the 1990 level by 2050.

On Thursday, Sens. Bernie Sanders (I-Vt.) and Barbara Boxer (D-Calif.) introduced a bill that would impose a carbon tax on fossil fuels at the wellhead and mine-head. The idea is the by boosting the price of fossil fuels, consumers and inventors will be incentivized to seek out and develop low-carbon and no-carbon energy sources. Boxer and Sanders are proposing that three-fifths of the \$1.2 trillion collected over the next ten years would be rebated annually to every legal resident and the rest would be funneled toward "investments in energy efficiency and sustainable energy technologies such as wind, solar, geothermal and biomass."

If Congress doesn't adopt some kind of carbon rationing scheme, the president intends to impose one through administrative fiat. ("If Congress won't act soon to protect future generations, I will," he promised.) The president is probably thinking of something along the lines of a plan to cap power company carbon dioxide emissions outlined in December by the Natural Resources Defense Council (NRDC). Under that proposal, the EPA would set emissions standards for each state based on their mix of power plants and then require them to meet various caps. The NRDC claims that its proposal could cut carbon dioxide emissions from America's power plants by 26 percent from 2005 levels by 2020 and 34 percent by 2025, all at a hypothetical cost of a mere \$4 billion.

The president was gung-ho about the country's natural gas boom, noting correctly that it "has led to cleaner power and greater energy independence." He then claimed, "Much of our new-found energy is drawn from lands and waters that we, the public, own together," and promised "my administration will keep cutting red tape and speeding up new oil and gas permits." Oddly, the president seems not to be in any hurry to cut the red tape that is halting the construction of the Keystone XL pipeline that would transport nearly 1 million barrels of crude per day from Canada's oilsands to refineries in the U.S. In any case, very little of the "newfound energy" in the form of oil is drawn from federal lands. Since 2007, 96 percent of the increase in oil production has occurred on private and state-owned lands, not federal lands. On that account, the administration still has a considerable way to go to fulfill the president's promise to speed production by cutting red tape.

The president endorsed a proposal by the Energy Security Leadership Council, a group of corporate CEOs and retired generals and admirals, to establish an Energy Security Trust. Funded by oil, gas, and coal royalties derived from leases on federal lands, the Trust would "be strictly limited to supporting R&D programs related to oil displacement in the transportation sector." The Trust proposal may have some bipartisan credibility, since Sen. Lisa Murkowski (R-Alaska) outlined a similar scheme in her Energy 20/20 plan.

So far billions in federal subsidies have failed to jumpstart an electric car industry, much less produce batteries that are ten times more powerful. Billions in federal subsidies have conjured the bioethanol industry into existence, but scientists still debate whether corn bioethanol actually reduces greenhouse gas emissions. A recent life-cycle analysis of corn ethanol production found that its greenhouse gas emissions could be "roughly 25 percent more than the entire lifecycle emissions of petrol." And that's on top of the questionable morality of turning half of America's corn crop into vehicle fuel.

The president proudly told the assembled members of Congress, "Last year, wind energy added nearly half of all new power capacity in America." One reason for that: Wind power producers rushed to complete projects before the end of the year because they feared that the federal production tax credit (PTC) of 2.2 cents per kilowatt-hour was about to expire. Not to worry. Buried among the tax increases Congress adopted to avoid going over the "fiscal cliff" at the turn of the year was an extension of the wind PTC. To get some idea of just how important this subsidy is, experts estimated that without it wind power installations would have fallen from 12 gigawatts in 2012 to 1.5 gigawatts in 2013.

Thanks to federal wind and solar subsidies, the amount of power produced by wind turbines has increased from 52,000 gigawatt-hours in 2009 to 139,000 gigawatt-hours in the past year. Solar power net generation rose to 2,400 gigawatt-hours in the past year from 900 gigawatt-hours in 2009. To provide some perspective, Americans consumed 4,000,000 gigawatt-hours of electricity in 2010, which means

that wind power contributed 3.5 percent and solar power less than one-thousandth of the electricity consumed by Americans.

Finally, President Obama announced, "I'm also issuing a new goal for America: Let's cut in half the energy wasted by our homes and businesses over the next 20 years." Hold on. If energy in our homes and business is actually being "wasted" why not cut all of the waste, not just half? I suspect what the president really means is that he would like us to double the energy efficiency of our houses and businesses. The president is basically adopting the goal set in the Energy 2030 report issued last week by the Alliance to Save Energy. This plan proposes a slew of tax breaks, direct subsidies, and other inducements to encourage Americans to use less energy.

Do Americans need to be lured by subsidy carrots and beaten with tax sticks to convince them use energy more efficiently? Perhaps not. Broadly speaking, Americans have been doing that all along. The Energy Information Administration's (EIA) 2013 Annual Energy Outlook report notes that between 1990 to 2011, energy use per dollar of GDP declined on average by 1.7 percent per year. It also projects that energy use per 2005 dollar of GDP will decline by 46 percent from 2011 to 2040. Part of that decline will result from government energy efficiency policies, but most will occur because of the market-driven efforts of consumers and businesses to save themselves money.

President Obama's ambitious energy efficiency goals will have to cope with the phenomenon of energy rebound. Energy and money saved in one place often gets spent elsewhere. For example, the EIA notes that houses built between 2000 and 2009 were 30 percent bigger than before 2000, but use 2 percent more energy. Residential energy efficiency improvements have been more than offset by consumer desires for larger houses. Similarly, an MIT study last year found that if Americans today were driving cars with the same average size and power of vehicles in 1980 that "the country's fleet of autos would have jumped from an average of about 23 miles per gallon (mpg) to roughly 37 mpg." Instead, gas mileage increased to only an average of 27 mpg. Americans chose to channel 60 percent the fuel efficiency savings into bigger and more powerful cars. In any case, a new analysis of energy efficiency engineering estimates suggests that the "energy efficiency gap" is much smaller than the president thinks it is.

Let's Make A Deal?

The president is right about this: The balance of current scientific evidence shows that the increasing concentration of greenhouse gases in the atmosphere, chiefly by burning fossil fuels, is likely boosting average global temperatures. The U.N. Intergovernmental Panel on Climate Change estimates that doubling the carbon dioxide in the atmosphere over its pre-industrial level of 280 parts per million is

likely to raise the global average temperature by around 3 degrees Celsius (5.4 degrees Fahrenheit). It's now at more than 390 parts per million. To the extent that Obama has accurately identified some deleterious trends, most researchers also agree that rising temperatures will, toward the end of this century, significantly exacerbate them. So if man-made global warming is going to become a big problem, how much would the president's proposals do to fix it? Not much.

One problem is that global warming is, well, global. Assuming the projected trajectory of overall global emissions by all countries, climatologist Chip Knappenberger of the Cato Institute, calculates that if the U.S. were somehow to entirely eliminate all of its greenhouse gas emissions right now that would reduce future warming by only 0.2 degree Celsius by 2100. In other words, the globe would warm by 2.8 degrees instead of 3.

Another problem with Obama's proposals is that many of them have already been tried and have failed. Carbon cap-and-trade in Europe, for example, has cost consumers \$277 billion for "almost zero impact" on cutting carbon dioxide emissions. Scores of billions in federal energy subsidies and tax breaks squandered over the past several decades have produced similarly dismal results.

Assuming that the federal government is going to do something about climate change, it oddly turns out that something like the Boxer and Sanders carbon tax and rebate scheme is the least economically damaging proposition. Barack Obama is always urging a "balanced approach" to solving problems. So in that spirit, here's an idea: Remove all regulations on carbon dioxide emissions and eliminate all energy subsidies and tax breaks in exchange for a revenue-neutral, fully rebated carbon tax. Deal?