Cutting Carbon Pollution
Protecting Americans from Climate Change

For more than 40 years, the U.S. Clean Air Act has proven itself an effective, efficient, and flexible tool that has protected public health while fostering economic growth and innovation.\(^1\) Using Clean Air Act authority, climate and energy experts at the Natural Resources Defense Council (NRDC) have crafted a groundbreaking proposal to cut the emissions that drive climate change and create jobs and grow the economy by going after the country’s largest source of climate-changing pollution—emissions from the hundreds of existing power plants.

by Starla Yeh

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State-Specific Standards

Unless heat-trapping carbon pollution is sharply reduced, negative impacts on the health of our families, communities, economy, and our planet will only grow. Already, climate change is increasing the numbers of record heat waves, droughts, and floods—and these extreme weather events will become even more powerful and frequent, threatening both lives and the global economy. In the wake of Superstorm Sandy, which devastated swaths of the U.S. Northeast coastline, states and cities must rebuild for this new reality, but simply preparing for more extreme weather is not an answer in and of itself. Future storms are expected to intensify and do even worse damage unless we act now to curb the carbon pollution that is driving climate change. To this end, nothing is more important than reducing carbon dioxide (CO₂) emissions from the largest industrial source of pollution: electric power plants. In the United States, these plants emit approximately 2.4 billion tons of CO₂ each year, roughly 40% of the nation’s total CO₂ emissions.

The U.S. Environmental Protection Agency (EPA) has both the authority and responsibility⁴ to reduce pollution from these plants under the U.S. Clean Air Act, the nation’s bedrock air pollution law adopted in 1970. NRDC has crafted an effective and flexible approach to cut carbon pollution from existing power plants that:

- uses the legal authority under the Clean Air Act;
- recognizes differences in the starting points among states;
- charts a path to affordable and effective emissions reductions by tapping into the ingenuity of the states; and
- provides multiple compliance options, including cleaning up existing power plants, shifting power generation to plants with lower emissions or none at all, and improving the efficiency of electricity use.

The NRDC plan has two key elements:

1. EPA would set state-specific emissions rates, reflecting the diversity of the nation’s electricity sector, as well as the state-by-state structure of Section 111(d); and
2. Power plant owners and states would have broad flexibility to meet standards in the most cost-effective way, through a range of technologies and measures.

Here’s how it would work: EPA would first tally up the share of electricity generated by coal- and gas-fired plants in each state during the baseline years (2008–2010 was used for this analysis). Then, the agency would set a target emission rate for each state for 2020, based on the state’s baseline share of coal and gas generation. The state standards proposed and analyzed in NRDC’s December 2012 report were calculated by applying a rate of 1,500 lb of CO₂/MWh for the baseline coal-fired generation share and 1,000 lb of CO₂/MWh for the baseline gas-fired generation share. Based on several model iterations, NRDC selected these nominal target rates to optimize emission reductions and compliance costs.

For example, a state that now gets 90% of its fossil-fueled electricity from coal and 10% from gas would be required to reduce its 2020 emissions rate to 1,450 lb/MWh by 2020 \([90\% \times 1,500) + (10\% \times 1,000)]\). In contrast, a state with 90% gas-fired generation would have a target of 1,050 lb/MWh \((10\% \times 1,500) + (90\% \times 1,000)\). A state starting with a 50–50 ratio of coal and gas generation would have a target of 1,250 lb/MWh. The allowable emissions rate would drop further in 2025.

The emissions standard for each state would be an overall emission rate average of all fossil fuel plants in the state. An individual plant could emit at a higher or lower rate.

Each covered plant with an emission rate above the...
An innovative feature of the proposal is the inclusion of energy efficiency—state-regulated energy efficiency programs could earn credits for avoided power generation and avoided pollution. Generators could purchase and use those credits toward their emissions compliance obligations, effectively lowering their calculated average emissions rate. Energy efficiency is one of the lowest cost energy resources and emission reduction options. States could use this provision to slash emissions without costly and lengthy power plant retrofits or new construction, reducing the overall cost of the regulations.

Using NRDC’s assumptions and the same sophisticated integrated planning model used by some in the industry and EPA, NRDC calculated the pollution reductions that would result from the proposed approach—and the costs and benefits of achieving those reductions. The plan would cut CO₂ pollution from U.S. power plants by 26% from 2005 levels by 2020 and 34% by 2025. The price tag: approximately $4 billion in 2020. But the benefits—in saved lives and reduced illnesses from reduced emissions of hazardous air pollutants (between $11 and 27 billion), and climate change avoided (between $15 and $33 billion)—would be $26 billion to 60 billion, 6–15 times greater than the costs. For Americans’ health and welfare, for the nation’s economy, and for the health of the planet, we can’t afford not to curb the carbon pollution from existing power plants.

### Table 1. Changes in net job years and utility bills by state from carbon standard in 2020.

<table>
<thead>
<tr>
<th>State</th>
<th>Total net change in job-years</th>
<th>Change in average monthly utility bill (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>5,000</td>
<td>1.82</td>
</tr>
<tr>
<td>Florida</td>
<td>14,000</td>
<td>-0.31</td>
</tr>
<tr>
<td>Illinois</td>
<td>7,800</td>
<td>-2.47</td>
</tr>
<tr>
<td>Iowa</td>
<td>5,100</td>
<td>1.06</td>
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<tr>
<td>Maine</td>
<td>-200</td>
<td>-3.19</td>
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<tr>
<td>Michigan</td>
<td>9,300</td>
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</tr>
<tr>
<td>Minnesota</td>
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<td>6.02</td>
</tr>
<tr>
<td>Montana</td>
<td>3,600</td>
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<td>New Hampshire</td>
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<td>North Carolina</td>
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<td>Oregon</td>
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<tr>
<td>Pennsylvania</td>
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</tr>
<tr>
<td>Virginia</td>
<td>5,000</td>
<td>-4.35</td>
</tr>
</tbody>
</table>

*Note: Estimates do not include future energy savings from efficiency measures or positive productivity impacts from reduced climate change.*
Job Creation

Based on the results of the analysis described above, NRDC asked independent research and consulting firm Synapse Energy Economics Inc. to examine the impacts that these carbon standards would have on jobs, electric bills, and gross domestic product (GDP), using widely-accepted economic modeling techniques. Synapse’s analysis found that a carbon standard for power plants, if implemented according to NRDC’s proposal, could create 210,000 jobs nationwide in 2020 (specifically, “job-years,” or one year’s worth of employment) and reduce the average household’s monthly electricity bill by $0.90. As a result of the job increases and electric bill savings, the impact on the nation’s GDP in 2020 would be negligible.⁷

These results were similar in individual states. Of the 14 states included in the study, every state but one would experience job growth as a result of cutting carbon pollution from power plants, with the increases ranging from 1,300 to 14,000 jobs. Maine would experience an estimated loss of 200 jobs compared with the number it would have in 2020 without the implementation of NRDC’s proposal for carbon standards. As shown in Table 1, residents in all but three of the 14 states would experience lower electricity bills in 2020 under the proposal compared to business-as-usual. It is important to note that these estimates do not include savings beyond 2020 from efficiency measures, and also exclude other economic benefits such as avoided climate impacts and positive productivity.⁸

These savings would occur because the energy efficiency program costs included in the electricity bills would be lower than the cost of electricity that would otherwise be required. While electricity rates (cents per kilowatt-hour) could go up modestly in some cases, electricity bills (rate multiplied by usage) go down, on average, because energy efficiency improvements reduce overall electricity consumption. Energy efficiency upgrades are the primary driver of job gains, creating 236,000 additional direct jobs in 2020. Shifts in other sectors (including not just power plants but also industries that supply inputs to their production) reduce the...
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A&WMA Member Emeritus Douglas Muschett, co-founder and past chair of the technical committee ES-4, Climate Change and Sustainability, announces his new educational Web site www.SeriousSustainability.org, which includes discussion of sustainability concepts, analytical tools, and publications.

net increase to 210,000. The increase in jobs stemming from increased deployment of energy efficiency programs has one very important benefit: These jobs cannot be outsourced and are in industries that have been especially hard hit by the recent recession. Because the bulk of investment is in making our buildings and homes more efficient, efficiency creates a lot of jobs that require a broad range of homegrown expertise, including electricians, carpenters, construction equipment operators, roofers, insulation workers, industrial truck drivers, construction managers, and building inspectors.

Conclusion

In his remarks on June 25, 2013, President Obama announced a robust plan for tackling climate change, noting that we have an obligation to protect our children and their future from climate change. The centerpiece of that plan is the task of cleaning up the dangerous carbon pollution from power plants. According to data from U.S. Energy Information Administration (EIA), CO₂ emissions from the power sector have declined 10% since 2005, but power plants remain our biggest source of carbon pollution and further reductions are both essential and achievable. While they must observe strict limits for arsenic, mercury, lead, and other emissions, they face no limits for their CO₂ pollution.

Under NRDC’s proposal, EPA, in partnership with the states, can set new carbon pollution standards under existing authority in the Clean Air Act that will cut existing power plant CO₂ emissions 26% by 2020 (relative to peak emissions in 2005). The approach includes an innovative provision that will drive investment in cost-effective energy efficiency, substantially lowering the cost of compliance, lowering electricity bills, reducing illnesses, and saving lives across the country. Recent analysis demonstrates that NRDC’s proposal for reducing carbon pollution from power plants by 26% will add more than 200,000 jobs to the U.S. economy, and save Americans money on their electric bills. Considering that climate change is already upon us and already affecting communities all across the nation, a path forward to less carbon, more jobs, and lower bills is the right one to take.

References


6. The analysis has been conducted using ICF’s IPM®, a power sector production cost linear optimization model that integrates wholesale power, system reliability, environmental constraints, fuel choice, transmission, capacity expansion, and all key operational elements of generators on the power grid.


8. A series of studies led by Dale Jorgenson at Harvard University found that implementing the Clean Air Act actually increased the size of the economy. Even after accounting for capital being diverted away from other uses, Jorgenson observed, improved health and a more productive workforce increased net economic output. The research concluded that by 2010, GDP was approximately 1.5% higher than it would otherwise have been since 1970, and this excludes all of the environmental benefits (e.g., ecological preservation) not accounted for in GDP estimates; available online at www.epa.gov/ocir/pdf/hottopics/2011_0208_white_paper.pdf.