

**BEFORE
the
SUBCOMMITTEE ON
ENERGY AND POWER
of the
HOUSE COMMITTEE ON
ENERGY AND COMMERCE
on
EPA'S PROPOSED GHG STANDARDS
FOR NEW POWER PLANTS
and
H.R.____, WHITFIELD-MANCHIN LEGISLATION**

**TESTIMONY
OF
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NATURAL RESOURCES DEFENSE COUNCIL**

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Summary

The United States and other large carbon-polluting nations urgently need to take sensible steps to create an affordable, reliable energy system that is compatible with protecting the climate.

The Clean Air Act, passed by Congress more than 40 years ago, allows EPA to set reasonable standards that can cut harmful carbon pollution. EPA has already adopted successful standards for cars and trucks, the second largest source of U.S. carbon pollution.

EPA has proposed standards for new coal plants that are based on carbon capture technology, which has been proven through use on other large industrial categories. Partial carbon capture can easily achieve EPA's proposed standard with costs that are within the range of alternative investments for new plant owners who may be considering options other than natural gas combined-cycle plants.

EPA also has announced a schedule for guidelines to control carbon pollution from existing power plants, in cooperation with state clean air officials. NRDC's own analysis, using an accepted government and industry utility model, demonstrates that it is feasible to achieve significant reductions in the more than two billion tons of annual carbon dioxide pollution from power plants, with benefits of \$25 to \$60 billion annually, compared to compliance costs of about \$4 billion.

Draft legislation proposed by Representative Whitfield and Senator Manchin would repeal EPA's carbon pollution authority for existing power plants and would allow the power sector to dictate the standards that could be adopted for new coal plants. This legislation would harm Americans by allowing excess carbon pollution from power plants that would stay in the air for centuries, disrupting the climate that sustains our civilization. Ironically, the legislation would not improve the lot of coal producers or communities in coal country. Rather, it would destroy power sector interest in deploying carbon capture and storage systems -- the one technology that could provide a pathway for more sustainable use of coal.

Mr. Chairman and members of the Subcommittee, thank you for inviting me to present NRDC's views on the need for carbon pollution standards for fossil-fueled power plants and on draft legislation authored by Chairman Whitfield and Senator Manchin.

NRDC is a nonprofit organization with more than 350 scientists, lawyers and environmental specialists dedicated to protecting the environment and public health in the United States and internationally, with offices in New York, Washington D.C., Montana, Los Angeles, San Francisco, Chicago, and Beijing.

Founded in 1970, NRDC uses law, science and the support of 1.3 million members and online activists to protect the planet's wildlife and natural environment, and to ensure a safe, healthy environment for all living things. NRDC's top institutional priority is curbing global warming and building a reliable, affordable and clean energy future.

We urgently need effective measures to cut dangerous carbon pollution from U.S. power plants and EPA is proceeding appropriately to use the authority Congress granted it in the Clean Air Act. The draft Whitfield-Manchin bill would repeal EPA's authority to implement standards for carbon dioxide (CO₂) and other greenhouse gas pollutants from existing fossil-fueled power plants and effectively allow the power sector to dictate the terms of any such standards for new coal-fueled power plants. This would be a major weakening of the Clean Air Act and NRDC urges you to oppose this legislative proposal.

Manmade "greenhouse gas" GHG pollution, including CO₂, is disrupting the climate that has supported the rise of modern civilization over the past 20,000 years. If we do not act now to cut these harmful pollutants, we will lock in dangerous changes to our climate system that will result in death, disease and misery for billions of people over hundreds of years into the future. Fortunately, the United States has the economic strength, technical know-how and policy instruments that can show the world that we can address this threat in a manner that secures our economic future.

In 2007 and again in 2011 the U.S. Supreme Court ruled that the Clean Air Act authorizes EPA to set sensible safeguards for CO₂ and other GHG pollutants. EPA has already set GHG standards for new cars and trucks, with the cooperation of domestic and foreign manufacturers. EPA is now in the process of developing standards for the largest U.S. source of CO₂ pollution, fossil-fueled power plants.

Fossil-fueled power plants are also the largest CO₂ source globally. We cannot protect ourselves from the harms of a severely disrupted climate system unless we set effective standards to limit carbon pollution from these plants.

As you know, EPA has proposed, and repropose, CO₂ standards for new natural gas and coal power plants. Under the Clean Air Act, EPA bases new source emission standards on the demonstrated capability of known technology, although source operators are free to use any approach they choose to meet the emission limits. In its recent reproposal, EPA based the proposed standard for new coal plants on currently available systems that capture CO₂ from large industrial gas streams. Once captured, CO₂ is compressed and transported typically via pipeline to geologic formations, where it can be isolated from the atmosphere while it is slowly converted back into a mineral form.

All aspects of these carbon capture and storage (CCS) systems have been demonstrated at commercial scale industrial facilities for decades.¹ They have operated reliably over multi-year periods to capture, transport, and safely dispose of millions of tons of CO₂. They can be readily applied at power plants, although to date, CCS has been used only to capture a small fraction of CO₂ emissions at a handful of power plants, typically for sale to the food and beverage industry.

¹ A useful summary of relevant CCS experience can be found in testimony presented by the Clean Air Task Force on October 29, 2013 before the House Committee on Science, Space, and Technology. See, http://science.house.gov/sites/republicans.science.house.gov/files/documents/HHRG-113-SY18-WState-KWaltzer-20131029_0.pdf

The reasons the power sector has not used CCS more broadly are not because of any technical shortcomings. Rather, the sector has not applied CCS because of a policy failure: up to now, there has been no national requirement to limit carbon pollution from power plants. CCS systems, like SO₂ scrubbers, mercury controls, fine particulate controls, and nitrogen oxide controls, are not free. With rare exceptions, none of these other systems were used before there were regulatory requirements to control these pollutants. Likewise, in the absence of any requirement to limit CO₂ pollution from new or existing power plants, there has been simply no reason for owners and builders of power plants to install CCS systems.

Large coal-based power companies themselves have argued that they cannot finance CCS systems without federal CO₂ standards. For example, in announcing the abandonment of a large-scale CCS project in 2011, the CEO of American Electric Power stated, “as a regulated utility, it is impossible to gain regulatory approval to recover our share of the costs for validating and deploying the technology without federal requirements to reduce greenhouse gas emissions already in place. The uncertainty also makes it difficult to attract partners to help fund the industry’s share.”²

As with other control technologies, there are some rare pioneers for CCS. Currently several plants that will include CCS are either under construction or in the advanced pre-construction stage. Southern Company’s new Kemper County, Mississippi coal plant and the refurbished coal plant at the Boundary Dam site in Canada are examples of CCS-equipped coal power projects nearing the end of construction. The Summit Power project in Texas and the Hydrogen Energy project in California are examples of CCS-equipped projects in the advanced pre-construction stages.

² <http://www.aep.com/newsroom/newsreleases/Default.aspx?id=1704>

Nonetheless, opponents of regulating CO₂ from power plants are arguing that EPA may not legally, or should not, base standards for new coal plants on this technology because it is not already widely used on power plants.

These arguments are wrong, both as a matter of law and of sound policy. The courts have upheld EPA's authority under the Clean Air Act to base New Source Performance Standards for a given industrial category on technologies whose performance has been demonstrated at other industrial categories.³

There is a sound policy basis for this interpretation of the law. In many cases (as is the case here), the failure of a particular industry to employ a demonstrated technology is due to the lack of any legal requirement to limit its emissions. If the law allowed a particular industry to immunize itself from requirements to use available, feasible control technologies just by refusing to adopt them voluntarily, the industry would be put in full control of whether it would ever have to improve its performance. That is precisely what the Whitfield-Manchin legislation would do: the bill as drafted would erect a permanent bar on EPA's basing a standard on CCS or any other technology until the industry decided to deploy that technology, voluntarily and without any government financial support, at numerous coal power plants. The bill would take the keys to clean air and climate protection from EPA and hand them to industry, no questions asked.

Turning to EPA's proposal for new power plants, the agency considered several options for new coal plant CO₂ limits, ranging from no CCS, partial CCS, to full (90%+ capture) CCS. EPA selected partial CCS as the basis for the proposed standard, after considering both technical and cost issues. EPA found that partial CCS was well demonstrated at relevant industrial scales and that when applied to coal power plants, partial CCS would have reasonable economic impacts.

³ See, e.g., *Lignite Energy Council v. EPA*, 198 F.3d 930 (D.C. Cir. 1999).

EPA's cost assessment started with the observation that under current and expected market conditions, new natural gas combined cycle (NGCC) power plants would typically have lower electricity production costs (levelized cost of electricity) than new coal units, even if no CCS were required for the coal unit.

But EPA noted that there might be instances where factors other than electricity production costs might cause investors or regulators to choose to build a coal plant or other non-NGCC power plant.

Accordingly, EPA compared the projected cost (using Department of Energy reports) of a coal unit with CCS to a coal unit without CCS and to other non-NGCC options, such as nuclear, biomass, and geothermal power plants.

In its analysis, EPA concluded the projected costs of a coal plant with partial CCS would range from \$92 to \$110 per Megawatt-hour (MWh) and this compared to a range for other non-NGCC options of \$80 to \$130 per MWh. Specifically, in comparing a new coal unit with *no* CCS to a coal unit with partial CCS, EPA found that applying partial CCS would increase the power production costs⁴ compared to the no-CCS case by 20% -- from \$92 per MWh to \$110 per MWh, if the CCS project received no revenues from the sale of CO₂ for enhanced oil recovery (EOR). If the income from CO₂ sales for EOR is included, the net production cost from the new CCS-equipped unit would range from \$88 to \$96 per MWh, depending on the price received for the captured CO₂.⁵

In sum, EPA's proposal for new coal plants is based on a careful review of industrial experience with large-scale CO₂ capture technology. EPA has compared projected costs of a new coal unit applying partial CCS with several other generation options and concluded the additional power production costs are 20% or less. EPA found these costs to be reasonable, given the substantial reduction in emissions that partial

⁴ Power production costs are only a portion of a customer's bill. Typically, about 40% of the bill consists of transmission, distribution and administrative costs. Moreover, in most systems, any single new power plant is only a small part of the total generating fleet whose costs go into the customer rate base. Thus, the increase in a customer's rates will be smaller than the increase in production costs at a new power plant.

⁵ US EPA, "Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units," at 240. <http://www2.epa.gov/sites/production/files/201309/documents/20130920proposal.pdf>

CCS would achieve at a new coal unit and the importance of providing a policy framework to support the use of CCS if new coal units are built.

EPA has started a process to develop standards for existing power plants under Section 111(d). Some in industry who want to stop both the new and existing plant standards are intimating that the agency must have a secret plan to impose a CCS requirement on every existing plant. There is no basis for this claim, which is designed to sow fear and confusion. Administrator McCarthy has made clear that one should not assume the existing plant standard will mirror the new source one. Even a proposal for existing plants that we at NRDC have developed would not impose a CCS mandate.

The Whitfield-Manchin discussion draft

Chairman Whitfield and Senator Manchin have responded to EPA's actions by circulating a draft bill that would allow coal plant owners to dictate what standards the government would be allowed to adopt for new coal plants. Second, the draft would completely repeal EPA's authority to implement any GHG standard for any existing fossil-fueled utility power plant.

NRDC strongly opposes the Whitfield-Manchin draft bill and if it is introduced, we will urge members to vote against reporting it out of the Subcommittee. The bill would render useless a key provision of the 1970 Clean Air Act—a law proposed and signed by President Richard Nixon—for controlling dangerous pollution from the nation's largest source category of that dangerous pollutant, fossil-fueled power plants. If this bill became law, it would effectively block any effort to curb fossil power plants' unlimited dumping of carbon pollution into our air, pushing us ever faster along the path to unmanageable climate disruption. The power sector now pollutes our air to the tune of more than 2 billion tons of CO₂ carbon pollution every single year, far outpacing the next largest category, motor vehicles.

EPA is using the Clean Air Act to cut carbon pollution substantially from the vehicle sector in a manner that is helping our economy while helping to protect our kids from climate disruption, and has now turned to the same task for power plants, the country's biggest carbon polluters. The Supreme Court has upheld EPA's carbon pollution authority twice, for vehicles in *Massachusetts v. EPA* in 2007, and for power plants in *American Electric Power v. Connecticut* in 2011. This bill effectively repeals the Clean Air Act authority for power plants.

It is a mistake to lay all the troubles of the coal industry on the Clean Air Act, and a mistake to believe that gutting the Clean Air Act will bring back the days of high coal consumption. In fact, this bill's biggest impact, if it were to become law, would be to cause investors and government actors to turn their backs on deploying CCS, the only technology that can make continued coal combustion compatible with our carbon-constrained future.

You all operate under a two-year license, with just one year left before you apply to the people for renewal. I know you take seriously your responsibilities as representatives of the people. In that spirit I ask that you consider the long-lasting damage this bill would do if it became law – your constituents and other Americans would be harmed by it for decades after your term in office.

The billions of tons of excess carbon pollution that power plants could release under this bill would stay in the atmosphere for more than a century, harming our children, grandchildren, and generations that follow. One hundred years from now, half of that excess pollution would still be up there, contributing to illness, flooding, droughts, crop losses, and other harms to real human beings—some of them the very children, grandchildren and great-grandchildren of the constituents who voted for you to protect their interests. Telling EPA it must ignore this pollution would be a toxic legacy akin to telling the Nuclear Regulatory Commission to set standards for radioactive waste only at levels agreed to by nuclear power

plant owners. Consider what you will say to your own grandchildren when they ask you years from now how you voted on this proposal and why.

This bill harms U.S. interests by making it harder for us to get other large polluter nations to cut their carbon pollution. While the U.S. is still history's largest carbon-polluter nation, as measured by cumulative emissions, we cannot protect ourselves by our actions alone. We need a strategy that helps us persuade other large polluter nations that we must all act in concert to protect our common future by moving quickly to a cleaner energy economy.

We are rightly proud of the many areas where the U.S. has been a model for the betterment of the human condition and that record is particularly strong when it comes to health and environmental protection. With the Clean Air Act we have constructed a model of environmental leadership that has helped the U.S. enjoy a reputation in the world that others can only wish they could achieve.

The Clean Air Act has worked: more than 40 years ago we began to cut sulfur emissions from power plants and this incredibly important public health initiative has spread around the world. We set ambitious tailpipe standards from cars and trucks and now the rapidly growing economies of Asia are requiring limits as good as or better than ours. We moved to take lead out of gasoline and the world has followed. And most recently, we acted to cut mercury and other toxins from power plants and this led to successful negotiation of a new international agreement under which other countries will act to cut these dangerous pollutants. When we lead, the world follows.

If this bill became law, it would make it much more difficult for the U.S. to convince other countries to act to cut their own climate-disrupting pollution. Since our citizens will suffer the harm from continuing today's level of carbon pollution around the world, the bill is directly contrary to U.S. interests. It would create exactly the wrong model for other countries: it would be a model of a country that ignores the scientific evidence, directs its environmental regulators to put on blinders to technologies that can

reliably and affordably cut emissions from the largest sources of harmful pollution, and puts the polluters in charge of determining whether the government will be allowed to protect its citizens.

From the perspective of coal advocates, the rationale for this bill appears to be that Congress can protect the volumes of coal consumed by the power sector by prohibiting EPA from setting any meaningful limits on carbon pollution from power plants. This tactic simply will not work.

A careful examination of the forces confronting the coal industry shows that handcuffing EPA cannot be a successful way to improve the lot of coal producers or coal communities. Most U.S. coal use is in the power sector and the power sector has choices for the resources it uses. The bill seems to ignore the obvious fact that power producers are not in business to burn coal. Their business interest is in supplying electricity resources and their fuel and technology choices will be driven by market forces that together are much more powerful than the effects of Clean Air Act standards on power production prices.

The biggest drivers of the market's continuing shift away from coal in the power sector are –

- the comparatively lower costs of natural gas as a fuel,
- the comparatively lower capital costs of natural gas power plants,
- the expanded penetration of renewables, particularly wind,
- the success of demand side management in reducing both annual and peak demands for power,
- and the conviction in much of the investor community, that climate science and observed climate disruptions will lead to public demands for policies to limit carbon emissions, likely before investments in new or refurbished coal plants are recouped.

Ironically, this bill would stop the improvement of the one technology that is essential if coal and natural gas are to continue to be a substantial energy resource: CCS. The bill cannot and will not do anything to deal with the fundamental issues facing the continued use of coal. If it became law (which it almost

certainly will not), it would be at most only an anesthetic that might provide coal producers with some short-term pain relief but at the cost of causing investors and government actors to turn their back on deploying CCS. This would leave the coal industry where it is today: unable and unwilling by itself to build CCS projects that provide cost-cutting practical experience at pertinent scales, trying to maintain sales to power sector customers that are increasingly not wedded to coal and thus quite apathetic about building CCS projects themselves.

Perhaps inadvertently, the bill essentially ensures that coal producers will have no chance of turning CCS into a real option for power sector investors. By telling coal producers' customers (power plant owners) that they can indefinitely avoid any meaningful EPA limits on carbon pollution by simply declining to pursue CCS projects, the bill eliminates any incentive for power producers to put their political and financial muscle into an effort to solve coal's carbon problem.

Indeed, if this bill were law, it would tell power plant owners that pursuing a CCS project would be against their economic interests because it would speed the day when the handcuffs on EPA's authority would be removed.

The reality is that hamstringing EPA will not keep coal from continuing to lose market share in the U.S. Instead, it will cause the power sector to look elsewhere to hedge its bets against the implications of climate disruption. Some in the coal-producing sector may think one can deal with climate disruption by enacting laws decreeing that we shall ignore it. But based on my conversations with many leaders in the power sector, that is not a view shared by the people who will be deciding what investments to make in new and existing power systems.

Some claim that today there is a "war on coal," while others, considering the health and environmental costs inflicted by today's use of coal to make electricity, say it is a "war by coal." But these charges and countercharges will not get us where we need to go as a society. What all of us need, both coal

promoters and coal critics is a broader consensus on sensible steps we can take to put our energy system on a more sustainable course. I continue to believe that it is possible to forge a consensus that includes a role for coal, at least as our society transitions in an orderly manner to resources that will function reliably to power growth without disrupting the climate we depend on to sustain modern economies.

A bill approved by this committee in 2009 and passed by the House a few months later demonstrates that it is possible to garner the support of many legislators far from “coal country” for policies that would give coal an opportunity to define a role for itself as a continuing part of the U.S. energy mix. That bill, authored by two Democrats from states not dependent on coal, included about \$60 billion in financial support for deployment of CCS on coal-fueled power plants. It is worth noting as well, that many environmental organizations that believe coal use must be phased out quickly nonetheless supported this legislation.

The Waxman-Markey bill did not become law but it does stand as a reminder that it is possible to broaden political support among elected officials from around the country for policies that could in fact provide a pathway for coal to earn a continuing role as a significant U.S. energy resource.

The Whitfield-Manchin draft bill would create a huge obstacle to reviving any potential consensus for incentives to deploy CCS. It is based on a fundamentally flawed strategy: that by barring EPA from considering practical, available technologies that can reduce power plant carbon pollution, Congress can spur new coal plant investments and keep old coal plants running indefinitely. Succeeding with this strategy would require investors, power company managers, and state utility regulators to deny both economic and climate risks.

A new coal plant without CCS is simply not equipped to manage the risks that it will face in the marketplace. Some coal producers may be able to persuade themselves that it makes sense to spend several billion dollars on a machine that will be the dirtiest new power option in the United States. But

coal producers won't be building power plants and the people who will be, are not going to believe that this bill provides them a stable platform for investing billions in projects that won't even be on line for perhaps another decade.

Power sector investors are increasingly learning from Wayne Gretzky: they are skating to where the puck will be, not where it is now. This bill tries to tell them there is no puck and that just won't fly.

Section-by-section discussion

The core substantive provisions of the bill are found in sections 2 and 3.

Section 2 of the discussion draft establishes a special hurdle for any new source performance standards for GHGs from new coal-fueled power plants. EPA would be barred from setting a GHG emission limit for new coal plants unless the limit has already been achieved at a minimum of six coal units located at six different U.S. generating stations. The stations must be in parts of the country that represent different operating characteristics of generating units. Third, EPA must ignore any results from any CCS projects that receive any government funding or financial assistance. Finally, the bill would require a separate standard for units using coal with average heat content of 8300 or less British Thermal Units per pound, with a requirement that the standard be no more stringent than the level achieved by three units, in different U.S. locations, using such lower-rank coal.

These criteria are designed to prohibit EPA from setting a GHG standard for new coal units that is any better than what at least six existing units are already achieving. By ruling out any units with CCS systems that have received any government financial assistance, the bill creates a condition for any meaningful GHG standard that is effectively impossible to meet. Suppose we assume that in this era of projected minimal new coal unit construction, six new coal units with CCS would be built. Under the bill, the owners of such plants could prevent EPA from basing a standard on their performance, by taking just one dollar of federal, state, or local financial assistance. What do you think they would do?

This is policy reminiscent of Kafka. If this bill became law, the most that EPA could do respecting GHG pollution from new coal units would be to adopt a do-nothing standard.

Section 3 of the draft repeals the Clean Air Act authority to reduce GHG pollution from existing or modified fossil power plants under section 111 of the Act. It does this by specifying that any such standards or guidelines shall not be effective unless Congress enacts a law specifying an effective date. This is a remarkable example of a sweeping repeal of an important law, based on nothing but speculation of how EPA *might* exercise its current Clean Air Act authority.

At this stage, the President and EPA have only set forth a schedule for the issuance of proposed and final guidelines under section 111(d) and a date for submission of state plans. One would hope that members of this Subcommittee would want to at least examine whether there might be steps that could be taken under section 111(d) that could become a reasonable program for reducing carbon pollution from the power sector.

Even in coal country not everyone believes that this Clean Air Act authority should be repealed. For example, the Chairman's own Commonwealth of Kentucky has provided a white paper to EPA outlining a framework for 111(d) guidelines that it describes as demonstrating that "we can achieve reductions to meet President Obama's goals in a meaningful manner that does not jeopardize our state's economy."⁶

NRDC has carried out analyses, using the contractor and utility model used by EPA and various power companies, that we believe demonstrate that significant reductions in carbon pollution from existing fossil power plants are possible, with benefits for Americans that would far outweigh the modest costs of compliance. As outlined in the attached Issue Brief,⁷ by implementing guidelines that would permit compliance using a range of power system resources, states could reduce power sector carbon pollution

⁶ Letter of October 22, 2013 from Leonard K. Peters, Secretary, Kentucky Energy and Environment Cabinet, to EPA Administrator Gina McCarthy.

⁷ NRDC, "Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants, Creating Clean Energy Jobs, Improving Americans' Health, and Curbing Climate Change," December 2012, IB:12-11-C. <http://www.nrdc.org/air/pollution-standards/files/pollution-standards-IB.pdf>

by 26% from 2005 levels by the year 2020 at a compliance price tag of about \$4 billion per year. But this program would deliver public health and climate protection benefits of \$25 to \$60 billion per year – benefits 6 to 15 times greater than the costs. Under the program analyzed by NRDC, pollution cuts could be achieved without increasing natural gas consumption or natural gas prices above business as usual projections. Wholesale electricity prices were not projected to increase above the business as usual case either.⁸

NRDC's proposal is one example of the opportunity to use the Clean Air Act creatively to start addressing the problem of continuing carbon pollution from America's power plants. Whether one prefers NRDC's approach, the approach developed by Kentucky, or some other approach, EPA has a process underway that should not be overridden by a poorly considered repeal of this important Clean Air Act authority. There will be ample opportunities for all voices to make their views known in the process EPA has begun. And the courts are available to review EPA's decisions to assure that they follow the law that Congress has already written.

The Clean Air Act is a showcase success story for America. It has worked to save tens of thousands of lives and avoid countless illnesses, while creating new markets for American technical ingenuity. This great creation of Congress can work to cut carbon pollution too and we urge the members of the Subcommittee to give clean air a chance.

Thank you for inviting me to testify. I will be happy to answer any questions you may have.

⁸ <http://www.nrdc.org/air/pollution-standards/files/pollution-standards-report.pdf>, Figure 11.2

ATTACHMENT

NRDC ISSUE BRIEF ON CARBON POLLUTION STANDARDS

FOR EXISTING POWER PLANTS

Using the Clean Air Act to Sharply Reduce Carbon Pollution from Existing Power Plants, Creating Clean Energy Jobs, Improving Americans' Health, and Curbing Climate Change

On the night he was re-elected, President Obama told the nation that he wants "our children to live in an America...that isn't threatened by the destructive power of a warming planet." In his first post-election press conference the President defined how by saying, **"we can shape an agenda that says we can create jobs, advance growth and make a serious dent in climate change and be an international leader."**

We agree. Climate and energy experts at the Natural Resources Defense Council have crafted a groundbreaking proposal to do just that.

This administration can create jobs, grow the economy, and curb climate change by going after the country's largest source of climate-changing pollution—emissions from the hundreds of existing power plants. NRDC's proposal shows how the Environmental Protection Agency, 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 emissions 26 percent 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, and creating thousands of jobs across the country. Further, NRDC's analysis shows that the benefits—in saved lives, reduced illnesses and climate change avoided—far outweigh the costs, by as much as 15 times.

Having endured a year when climate change contributed to damaging floods, widespread wildfires, record drought and superstorm Sandy, which cost Americans hundreds of lives and hundreds of billions of dollars, we can't afford to wait any longer to act. For the health and welfare of Americans, for the nation's economy, and for the stability of the planet, now is the time to reduce pollution from America's power plants, dramatically increase the energy efficiency of our economy and reduce the threat of climate change.

We know where the pollution is; now we just have to go get it.

THE IMPERATIVE TO CUT CARBON POLLUTION

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. coastline, states and cities must rebuild for this new reality. But simply preparing for more extreme weather is not an answer by itself. Future storms will be stronger and do even worse damage unless we act now to curb the carbon pollution that is driving dangerous climate change.

To this end, nothing is more important than reducing carbon dioxide (CO₂) emissions from the largest industrial source of pollution: electricity-generating power plants. In the United States these plants emit about 2.4 billion tons of CO₂ each year, roughly 40 percent of the nation's total emissions.

To be sure, the EPA has taken important first steps by setting standards that will cut the carbon pollution from automobiles and trucks nearly in half by 2025 and by proposing standards to limit the carbon pollution from new power plants. But the EPA has yet to tackle the CO₂ pollution from hundreds of *existing* fossil-fueled power plants in the United States.

The EPA has both the authority and responsibility to reduce pollution from these plants under the 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 the private sector.
- 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.

Using the same sophisticated integrated planning model used by the industry and the 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 America's power plants by 26 percent from 2005 levels by 2020 and 34 percent by 2025. The price tag: about \$4 billion in 2020. But the benefits—in saved lives, reduced illnesses, and climate change avoided—would be \$25 billion to 60 billion, 6 to 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.

EPA HAS THE LEGAL AUTHORITY AND OBLIGATION TO REDUCE CARBON POLLUTION

The Clean Air Act has been remarkably successful over its 40-year history. Most Americans now breathe much cleaner air, our cities are no longer enveloped in smoke and smog, the nation's lakes and rivers are recovering from acid rain, and the ozone layer that shields us from dangerous ultraviolet radiation is healing after the phase-out of CFCs and other ozone-destroying chemicals.

The Clean Air Act can also help stem the threat of climate change by reducing carbon pollution. In 2007, in *Massachusetts v. EPA*, the U.S. Supreme Court ruled that the EPA has the authority and responsibility to curb heat-trapping pollutants under the Clean Air Act, rejecting the Bush Administration's claim that greenhouse gases are not pollutants under that law. In that case, the nation's highest court ruled that if the science shows CO₂ and other heat-trapping pollutants endanger public health and welfare, then the EPA must set standards to reduce their emissions from new cars and trucks.

In President Obama's first term, the EPA responded to the Supreme Court decision by presenting overwhelming scientific evidence that CO₂ and the other heat-trapping pollutants do indeed endanger public health and welfare. The administration then set new standards in 2010 and 2012 to dramatically cut the carbon pollution from new cars and SUVs and from heavy trucks and buses.

In a second Supreme Court decision in 2011, *American Electric Power v. Connecticut*, the high court ruled that it is also the EPA's responsibility to curb the carbon pollution from the nation's power plants. The legal authority for power plant standards comes from Section 111 of the Clean Air Act, which directs the EPA to set "standards of performance" (typically a maximum emissions rate) for stationary sources like power plants that emit harmful air pollutants. Section 111(b) covers new facilities, while Section 111(d) gives the EPA and states shared responsibility for curbing pollution from existing facilities. Under Section 111(d), the EPA issues guidelines on "the best system of emission reduction," and then each state is required to adopt and submit a plan for setting and meeting emissions standards.

In April 2012, the agency took the first step toward addressing power plant pollution by proposing the "Carbon Pollution Standard for New Power Plants" under Section 111(b). The standard would require that new plants emit no more than 1000 pounds of CO₂ per megawatt-hour (lbs/MWh). To put that in context, coal power plants typically produce about 2100 lbs/MWh, while natural gas-fired plants emit 1000/MWh or less. Power companies building new facilities could thus meet the standard with existing natural gas power plant technologies, zero-emitting renewables, or with efficient coal plants equipped with systems to capture and sequester carbon dioxide.

The EPA's assessment, widely shared in the private sector, is that even without the proposed carbon pollution standard new power supply needs will be met by a combination of natural gas, renewables, energy efficiency, and other resources because the construction of new conventional coal-fired power plants is uneconomic. The new source standard is expected to be finalized in the next few months.

EPA, however, still hasn't addressed the largest source of carbon pollution, *existing* power plants. NRDC's approach addresses the challenge of creating equitable regulations for these sources under Section 111(d), recognizing that the type and mix of power plants varies among the states. If all existing power plants were limited to 1000 lbs of CO₂/MWh, for instance, states with a high percentage of coal-fired plants would face a much larger task compared to those with lots of natural gas plants or renewables. The flexible approach NRDC proposes will help reduce the carbon pollution from existing power plants in a fair, affordable, and achievable manner.

STATE-SPECIFIC STANDARDS AND FLEXIBLE COMPLIANCE OPTIONS

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).

(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: the 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 this report were calculated by applying a rate of 1500 lbs of CO₂/MWh for the baseline coal generation share and 1000 lbs of CO₂/MWh for the baseline gas-fired generation share.

For example, a state that now gets 90 percent of its fossil-fueled electricity from coal and 10 percent from gas would be required to reduce its 2020 emissions rate to 1450 lbs/MWh [(90 percent x 1500) + (10 percent x 1000)]. In contrast, a state with 90 percent gas-fired generation would have a target of 1050 lbs/MWh [(10 percent x 1500) + (90 percent x 1000)]. A state starting with a 50:50 ratio of coal and gas generation would have a target of 1250 lbs/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.

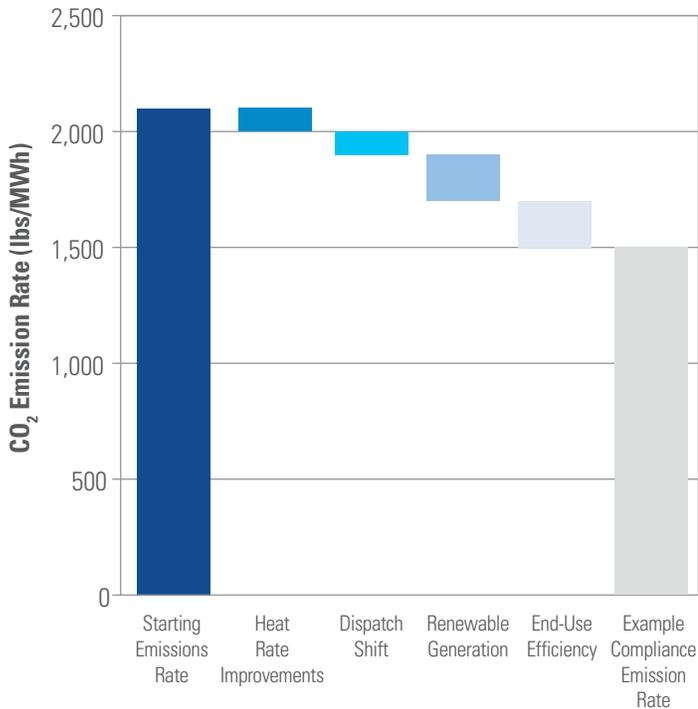
Each covered plant with an emission rate above the state standard could meet the standard by using one or more compliance options: First, a plant could reduce its own CO₂ emission rate by retrofitting a more efficient boiler or installing CO₂ capture systems, for instance, or it could burn a mixture of coal and cleaner fuels, such as gas or certain types of biomass.

Second, the owners of multiple power plants could average the emissions rates of their plants, meeting the required emission rate on average by running coal plants less often, and ramping up generation from natural gas plants or renewable sources instead. They could retire coal plants and build new natural gas and renewable capacity, if needed, creating a cleaner overall electricity-generating fleet. Low- or zero-emitting sources, such as wind and solar, would earn credits that generators could use to lower their average emissions rate. The plan also allows trading of credits between companies within a state, and across state lines among states that choose to allow it, further lowering the overall costs of compliance.

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 towards 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.



Figure 1: Generator Compliance: Illustrative Example



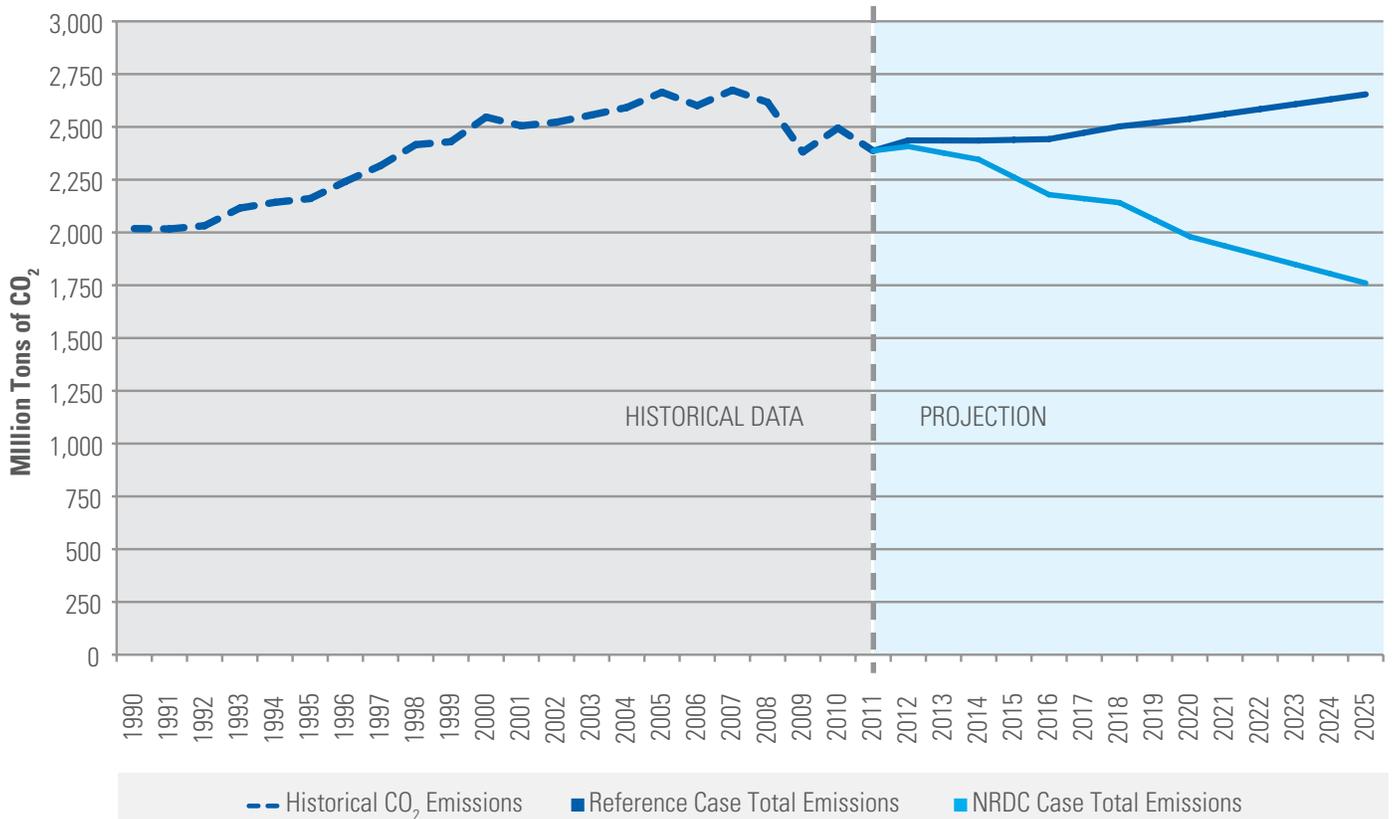
Improving energy efficiency also cuts costs to consumers and businesses. Switching to more efficient light bulbs, adding weather-stripping or insulation in buildings, or installing more efficient appliances and equipment, for example, can save a typical household more than \$700 per year—about one-third of the \$2,200 average annual utility bill.

Energy efficiency programs should include rigorous requirements to ensure that credited reductions in electricity use are real and verifiable. These requirements are addressed in the proposal.

The range of compliance options enables a 26 percent reduction in emissions of climate-change-causing CO₂ emissions from existing power plants by 2020 compared to 2005 levels (or equivalently, a 17 percent reduction compared to 2011 levels; see Figure 1: Generator Compliance: Illustrative Example; and Figure 2: Power Sector CO₂ Emissions Projections (Million Short Tons)).

States would have additional options. They could follow the EPA model program. They also would have the freedom to adopt alternative approaches—such as those already implemented in California and the Northeast States (through the Regional Greenhouse Gas Initiative)—as long as the states demonstrate those approaches will achieve equal or lower emissions.

Figure 2: Power Sector CO₂ Emissions Projections (Million Short Tons)



THE BENEFITS OF IMPLEMENTING THE PROPOSAL

NRDC asked ICF International to analyze the proposed approach using the company's proprietary Integrated Planning Model (IPM®). Used routinely by both the utility industry and regulators to determine cost-effective ways of meeting the nation's electricity needs and to assess the effects of regulations, the IPM® models the entire electric power sector. It integrates extensive information on power generation, fuel mix, transmission, energy demand, prices of electricity and fuel, environmental policies, and other factors.

For this analysis, NRDC made a series of conservative assumptions about fuel prices, energy demand, and policies to plug into the IPM®—and also assumed that new EPA rules limiting emissions of mercury, air toxics and further reducing sulfur dioxide and nitrogen oxides would be implemented.

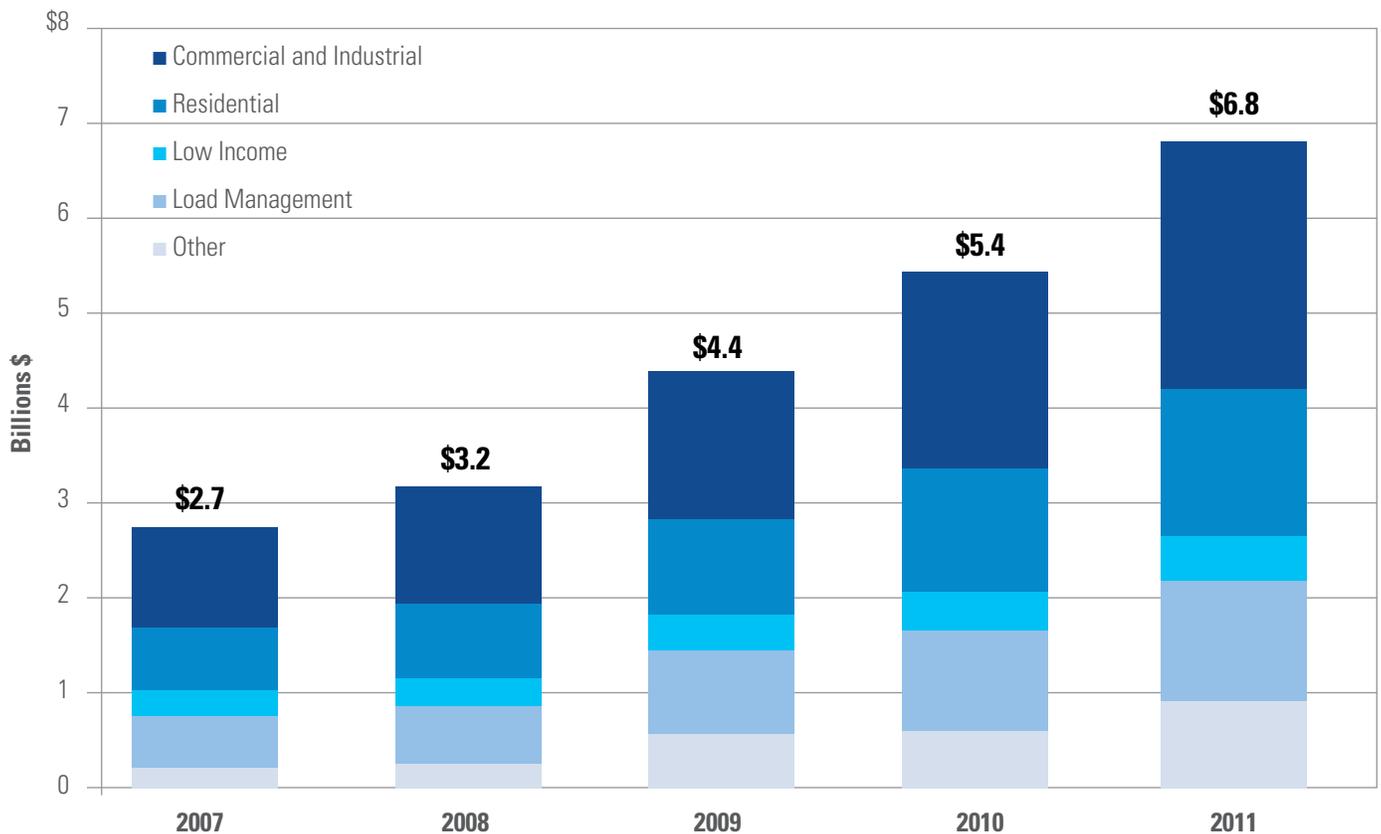
Modernizing the Electricity Sector

The results from the model show that the proposed approach would begin to modernize and clean up America's electricity sector while modestly *reducing* the nation's electricity bill. This is because energy efficiency programs adopted in response to the incentives created by the approach would cause overall demand to decline by 4 percent, rather than

increase by 7 percent. Meanwhile, coal-fired generation would drop 21 percent from 2012 to 2020 instead of increasing by 5 percent without the proposed carbon standard. Natural gas generation would rise by 14 percent, while renewables rise by about 30 percent (assuming no new state or federal policies to expedite an increase in market share for renewables).

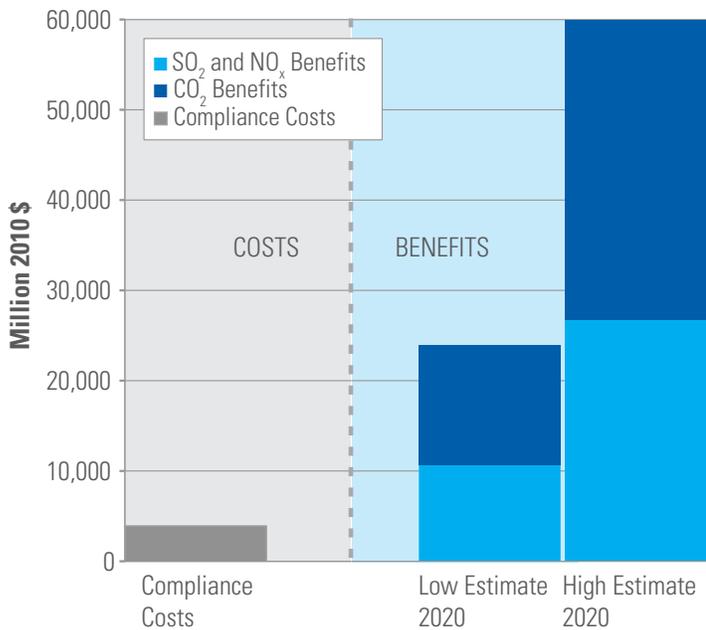
Investments in energy efficiency and demand response are the lowest cost compliance pathway—much cheaper than building new power plants or installing pollution control equipment—so including this flexibility significantly reduces overall costs. Energy efficiency consistently delivers over three dollars in savings for every dollar invested, which is one of the many reasons utilities have scaled up annual investment from \$2.7 billion in 2007 to nearly \$7 billion in 2011, with a corresponding increase in energy savings. See Figure 3: U.S. Electric Efficiency Program Investments, 2007-2011. Efficiency investments reduce the need to build additional power plants and infrastructure, reduce wholesale power prices, and deliver significant bill savings to individuals and businesses. Because substantial reductions in CO₂ can be achieved through energy efficiency without building many new power plants or installing lots of expensive pollution control equipment, the total costs of compliance would be low—netting out at \$4 billion in 2020.

Figure 3: U.S. Electric Efficiency Program Investments, 2007-2011



Source: CEE, 2011 State of the Efficiency Program Industry.

Figure 4: Estimated Costs and Benefits From Reductions in SO₂, NO_x, and CO₂ (2020)



Health and Environmental Benefits

The benefits of the proposal far outweigh the costs. Carbon dioxide from power plants contributes to the severity of heat waves, droughts, floods and rising sea levels, all of which bring an enormous toll in human lives, devastation and economic disruption. The value of reducing carbon pollution is estimated at \$25 to \$59 per ton, or more.

The proposal also brings cuts in emissions of traditional pollutants like sulfur and nitrogen oxides spewing from power plants beyond what current regulations would achieve. The emissions reductions delivered by implementing the proposal would prevent more than 23,000 asthma attacks, avoid more than 2,300 emergency room visits and hospital admissions per year and prevent thousands of premature deaths.

The benefits of reducing CO₂ and the traditional pollutants are both substantial, and add up to \$25 to \$60 billion. That's 6 to 15 times higher than the costs of complying with the proposal (see Figure 4: Estimated Costs and Benefits From Reductions in SO₂, NO_x, and CO₂ (2020)).

What's more, this approach would stimulate investments of more than \$90 billion in energy efficiency and renewables between now and 2020, boosting local and state economies. Establishing such CO₂ emission standards now will give the power industry the investment certainty it needs to avoid billions of dollars of stranded investment in obsolete power plants.



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