



ISSUE BRIEF

ILLINOIS'S CLEAN ENERGY FUTURE



Opportunities to Cut Carbon Pollution Under the Clean Power Plan

Illinois has an opportunity to tap a well of economic growth that could provide new jobs, expand the economy, and help protect future generations from the worst impacts of a changing climate. That opportunity is clean energy, and one way for Illinois to realize clean energy growth is through the U.S. Environmental Protection Agency's Clean Power Plan. Illinois can cut a significant amount of carbon pollution by improving energy efficiency in homes and buildings and by expanding the amount of power it gets from renewable sources like the wind and sun. These investments will create new clean energy jobs, protect Illinoisans' health from the harmful effects of air pollution, and save them money on their electric bills.

Climate change is a clear and present danger to Illinoisans' health and communities, bringing stronger storms, harsher droughts, and rising temperatures—most recently highlighted by findings that 2014 was, globally, the hottest year on record.¹ The National Climate Assessment, a recent report from 13 federal agencies, warned that human-induced climate change impacts are happening today, and worsening in every region of the United States.

Increased temperatures pose severe public health risks for Illinois residents. Without efforts to reduce our carbon pollution, heat waves like the one in Chicago in 1995—which killed more than 700 people—could occur as often as once every two years by the 2050s.² Heat waves far worse than the one in 1995, such as the 2003 European heat wave that resulted in 30,000 deaths, could occur once every two summers by the 2080s. The costs of climate change are rising as well. Climate-related disasters in 2012 cost American taxpayers more than \$100 billion.³ Illinois residents paid an estimated \$4.5 billion in federal taxes, or \$1,100 per taxpayer, to clean up extreme weather events in 2012.⁴

OVERVIEW OF THE CLEAN POWER PLAN

For the sake of our children and generations to come, we have an obligation to reduce the dangerous carbon pollution that traps heat and is fueling climate change. The nation's fossil-fuel power plants are the single-biggest source of carbon pollution in the U.S., accounting for nearly 40 percent of the total. Today we limit mercury, lead, and soot from these power plants, but not carbon pollution. That is changing. On June 2, 2014, the EPA proposed the Clean Power Plan, which sets the first-ever standards limiting carbon pollution. The plan, when in place, would prevent the emission of about 550 million metric tons of carbon dioxide nationwide annually in 2030 and would cut power sector pollution 30 percent below 2005 levels.⁵

Nationwide, the Clean Power Plan can usher in climate and health benefits worth an estimated \$55 billion to \$93 billion in the year 2030, according to an EPA analysis. Its emission reductions would prevent 2,700 to 6,600 premature deaths in the year 2030. These benefits far outweigh the estimated national annual compliance costs of \$7.3 billion to \$8.8 billion annually in 2030, which includes the fuel and operating costs of the electricity system as well as leveled capital costs.⁶ Additionally, the EPA's proposed carbon pollution standards will stimulate investment that puts Americans to work making our homes and businesses more energy efficient. The agency estimates the projected increase in smarter energy use will shrink consumers' electricity bills by roughly 8 percent in 2030 nationwide.^{7,8}

Putting carbon pollution limits on power plants also will give the United States leverage in the international community to elicit strong commitments to reduce pollution from countries around the world. Already the Clean Power Plan proposal helped the United States reach a landmark agreement in November 2014 with China to reduce carbon pollution in both countries.

Energy efficiency investments reduce energy waste in homes and buildings, leading to smaller monthly electric bills while also cutting pollution. These investments create good-paying jobs as demand increases for manufacturers of efficient appliances, construction workers to build efficient homes and weatherize existing ones, and skilled technicians to do energy audits and install efficient technologies. In addition, as energy bill savings put more money into consumers' pocketbooks, there is increased spending on other goods and services—and associated job creation—across the economy.

ILLINOIS'S CARBON POLLUTION TARGET

Every state, Illinois included, has the opportunity to craft its own best strategy to reduce pollution and protect our climate. The EPA is expected to finalize the Clean Power Plan in the summer of 2015, and the following year each state must submit an initial plan to meet its pollution target. Investing in energy efficiency and renewable wind and solar power should be a fundamental part of Illinois's strategy.

The Clean Power Plan proposal sets a state pollution reduction target by assessing four readily available methods (or "building blocks") for cutting pollution in each state. The target is expressed in intensity—pounds of carbon dioxide per megawatt-hour (MWh) of electricity produced—and Illinois is being asked to reduce its pollution intensity **33 percent by 2030**. The four building blocks the EPA used to establish state targets are: 1) making coal-fired power plants more efficient by increasing the amount of electricity they generate from each ton of coal burned; 2) using natural gas power plants more effectively by dispatching them before coal plants; 3) increasing renewable energy growth, based on a growth rate already being met in the region; and 4) increasing energy efficiency (cutting energy waste) in homes and buildings, thereby reducing the amount of energy that must be generated from fossil fuels to power them. While the carbon pollution targets are based on these building blocks, states can meet the standards in any way they choose. The Clean Power Plan puts Illinois in the driver's seat, with flexibility to design a plan based on its energy mix to chart a low-carbon path forward.

LESS POLLUTION, MORE JOBS, LOWER ELECTRIC BILLS

Cutting carbon pollution will create benefits to consumers on their electric bills and will boost job growth in Illinois. According to a Natural Resources Defense Council (NRDC) analysis, setting a standard to reduce more carbon pollution than the EPA's current proposal would do even more to create jobs and reduce consumer energy bills. If Illinois were to ramp up energy efficiency and renewable power to the higher but still relatively modest levels NRDC analyzed,⁹ **Illinois would see the creation of 7,200 new jobs**, and the state's households and businesses would **save \$803 million on their electric bills** in 2020.¹⁰ Because of the benefits to consumers' bills and to the state's job growth, NRDC recommended that the EPA require more pollution reductions nationally than currently in the Clean Power Plan proposal.

Illinois could create far more jobs than determined in the NRDC analysis by further boosting renewable energy and energy efficiency. If the state increases its renewable portfolio standard (RPS) to 35 percent by 2030 and expands energy efficiency programs to achieve a 20 percent reduction in electricity load by 2025, Illinois would generate more than 32,000 total jobs in the state, from solar photovoltaic construction workers to utility technicians to retail electronics store employees.¹¹

GRID RELIABILITY IN ILLINOIS

For 40 years, our country has been able to dramatically reduce pollution under the Clean Air Act while keeping the lights on and costs low. Grid operators like MISO and PJM, each of which operates portions of the Illinois grid, routinely plan ahead to meet changing electricity needs. Smart grid planning, coupled with supply- and demand-side investments, will position grid operators to be able to fulfill electricity demand while states implement the Clean Power Plan. In recent years, billions of dollars have been invested in new transmission infrastructure to make sure electricity can be distributed wherever and whenever it is needed. Energy efficiency savings continue to temper demand, which makes it easier for producers and grid operators to ensure adequate electricity supplies.

Moreover, since 2005, changes in the nation's power supply and shifts in state policies have already resulted in a 15 percent reduction in carbon pollution from power plants.¹² Increases in energy efficiency and renewable energy have displaced fossil generation, and lower-cost natural gas plants have increasingly displaced coal-fired power plants. The grid has easily accommodated these changes through management and planning. This bodes well for our ability to maintain electricity reliability as we cut carbon pollution under the Clean Power Plan. In addition, renewable energy can actually increase reliability of the electric grid. Thanks to more precise weather forecasts and improved technologies, grid operators are increasingly able to predict renewable energy power output. Wind power can be used to help stabilize the grid with high-quality power.¹³ Unlike fossil fuel and nuclear sources, which can have large, abrupt, and unpredictable changes in electricity output, changes in wind and solar generation tend to be gradual and predictable.¹⁴ This means that wind and solar need less backup generation than fossil fuel or nuclear sources. In fact, increasing renewable energy output sevenfold

(35,000 MW) in the PJM power region would increase the need for fast-acting backup electricity sources by 1 percent of the added renewable energy capacity (340 MW).¹⁵ For comparison, the PJM region currently maintains 3,350 MW of expensive fast-acting backup sources—enough to power 3.3 million homes—to ensure that it can keep the lights on in case a large fossil-fuel or nuclear power plant unexpectedly breaks down. Thanks to management, planning, and improved grid technologies, Illinois can cut pollution, increase energy efficiency, and add renewable energy capacity while maintaining a strong and reliable electric grid.

THE ELECTRICITY SECTOR IN ILLINOIS TODAY

Figure 1 shows that in 2013 Illinois generated most of its electricity from coal (43.5 percent) and nuclear (47.8 percent) sources. The rest of the state’s energy mix came mostly from natural gas (3.3 percent) and non-hydro renewables (5.1 percent).¹⁶ Illinois spent \$1.9 billion on fossil fuels for electricity generation—of which \$1.65 billion went toward coal—in 2012 alone.¹⁷

As shown in Figure 2, energy efficiency and renewable energy technologies are zero-carbon, low-cost options that can help meet the goals of the Clean Power Plan. Energy efficiency is the lowest-cost resource to meet the state’s carbon pollution reduction goals because electricity savings can be achieved at costs well below those of new generation, resulting in lower electricity bills for homes and businesses. Further, with technological advances and taller wind turbines that have improved performance, wind power has become competitive with new natural gas plants in many parts of the country.^{18,19} Solar power also is becoming increasingly competitive, as a result of rapidly declining

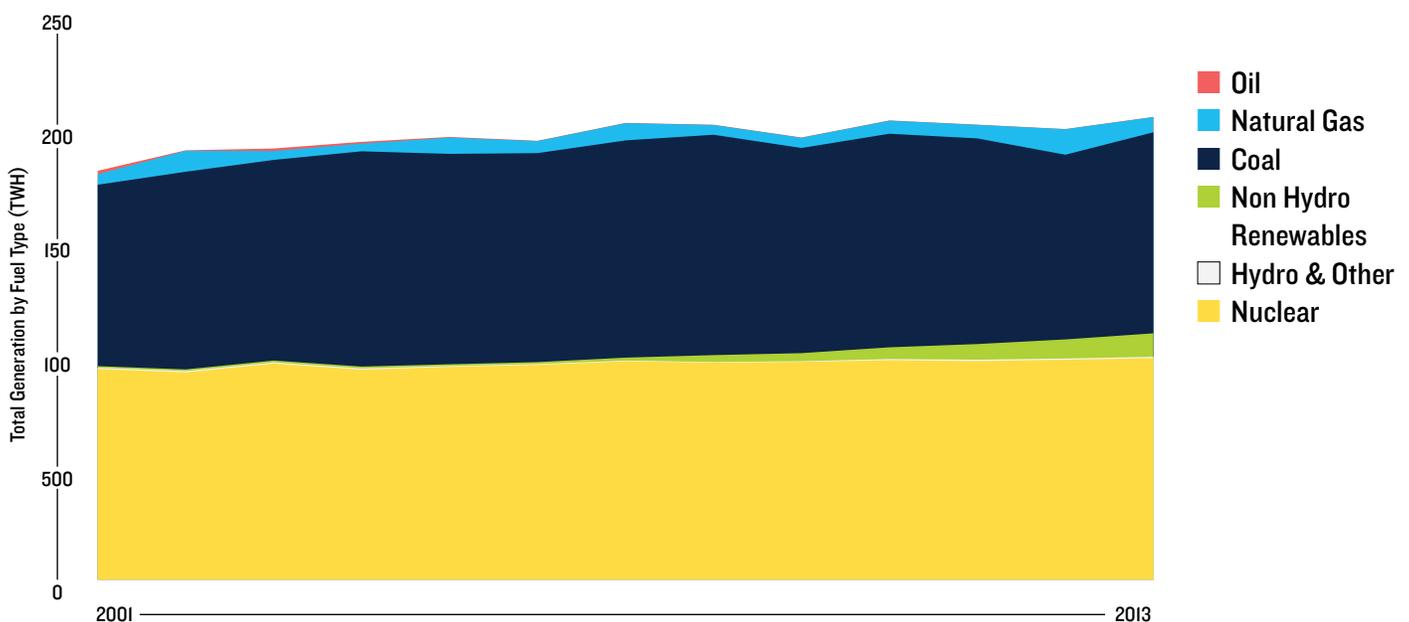
costs for solar panels, and most analysts expect that these costs will continue to decline over the next decade.²⁰

Illinois has ample renewable resources, and current policies are capitalizing on the clean energy potential of the state. For example, Illinois has the 15th-best wind potential in the nation and in 2014 ranked fifth in total installed wind capacity.²¹ The previous year, Illinois ranked fourth for wind capacity but subsequently slipped behind Oklahoma. While Illinois’s renewable policies help put the state on track to meet EPA’s reduction target, it should strengthen its RPS to maintain its position as a state leader on renewables.

To help reduce its need for fossil-fuel power, Illinois already has an energy efficiency standard requiring annual savings of 1.4 percent of retail sales. In order to meet this standard, utilities must offer and implement energy efficiency programs to help residential and commercial customers save money on their electric bills. Illinois has two policies that govern utility investment in energy efficiency. Section 8-103 of the Public Utilities Act contains the energy efficiency portfolio standard (EEPS), and under section 16-111.5B of the Illinois Power Act (IPA), efficiency programs can be expanded if they are cost effective. Figure 3 represents the efficiency savings resulting from both the EEPS and IPA for the investor-owned utilities ComEd and Ameren.

By the end of 2016, NRDC estimates these energy programs will have resulted in cumulative net savings of nearly \$1 billion for Illinois residents and prevented 12 million tons of carbon pollution.²² A separate NRDC report found that investments in energy efficiency could save Illinois businesses \$448 million in 2020 alone.²³ Illinois can build on this progress as it creates its carbon pollution reduction plan.

FIGURE 1: ILLINOIS’S ELECTRICITY GENERATION SOURCES (2001–2013)



Source: Energy Information Administration

FIGURE 2: COSTS OF ELECTRICITY GENERATION BY SOURCE (\$/MWH)

Energy efficiency is the cheapest of all energy resources. Wind and utility solar PV are competitive with new natural gas combined cycle plants..

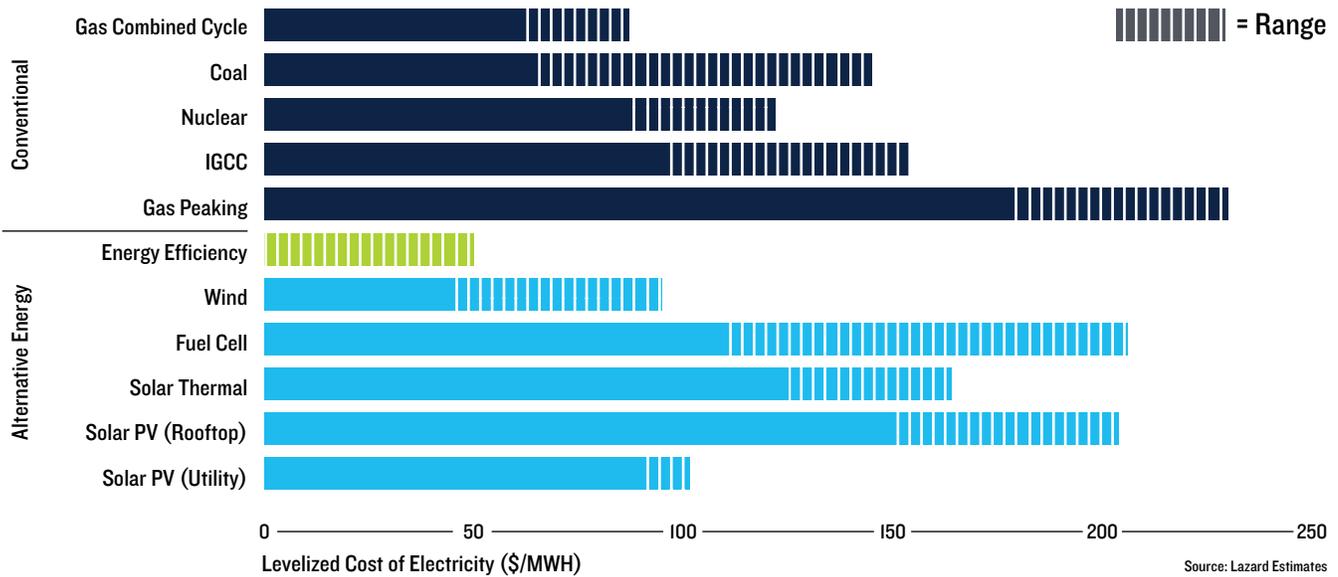
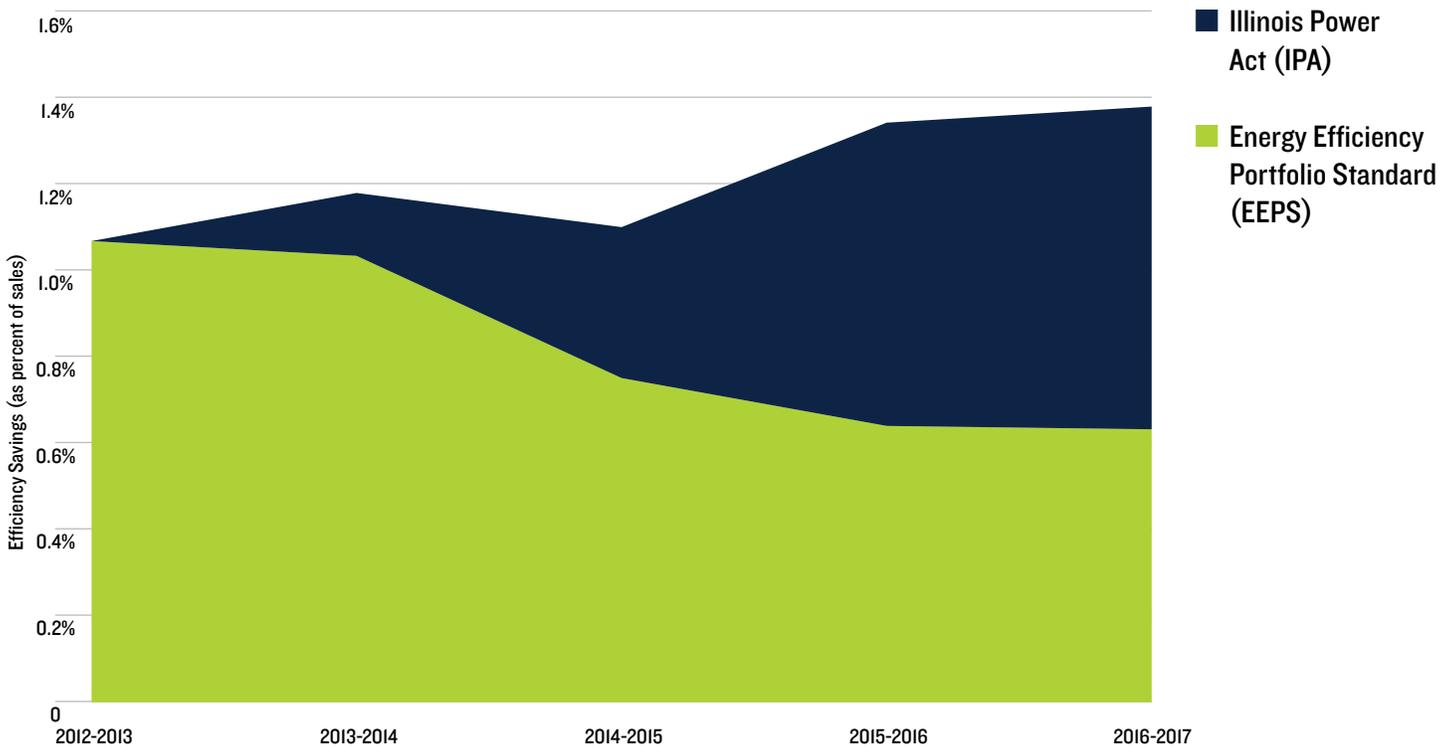


FIGURE 3: ILLINOIS EFFICIENCY SAVINGS FOR INVESTOR-OWNED UTILITIES (2012-2017)

The figure illustrates savings from both the energy efficiency portfolio standard (EEPS) and the Illinois Power Act (IPA). The IPA provides for the expansion of energy efficiency programs if they are cost-effective.

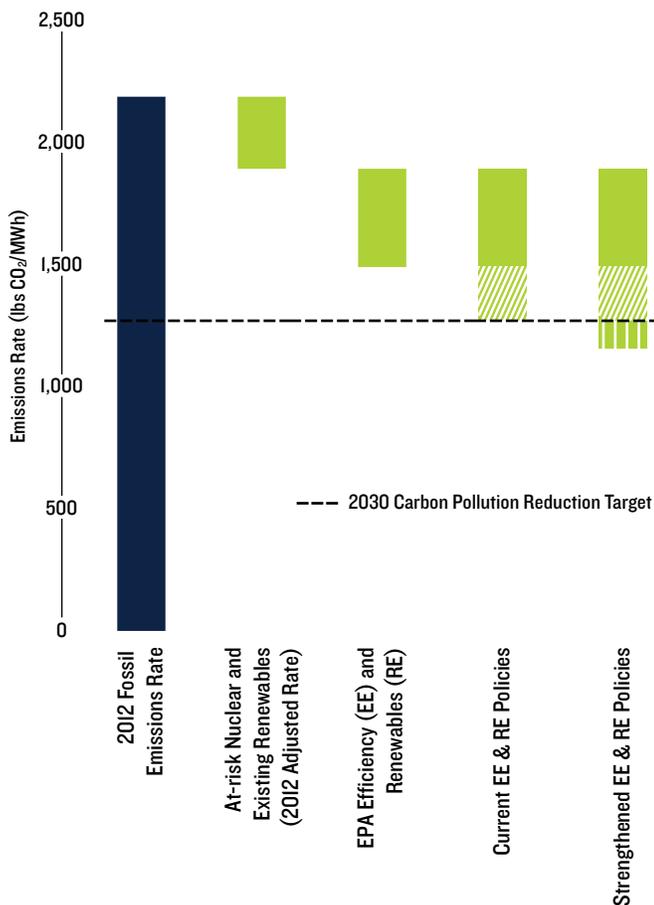


A CLEAN ENERGY FUTURE FOR ILLINOIS

Illinois is well positioned to meet its carbon pollution reduction target under the Clean Power Plan. Illinois can achieve at least 30 percent greater savings than is currently being achieved. By strengthening the energy efficiency standard to 2 percent savings, Illinois’s annual carbon pollution reductions would grow to 15.1 million tons in 2020 and 18.9 tons in 2025. Illinois is making progress on renewable energy as well, with more than 9 million megawatt-hours already generated annually.²⁴

FIGURE 4: AN ILLINOIS PATHWAY TO CUT CARBON POLLUTION

Illinois can exceed its 2030 pollution reduction target (1,271 lbs CO₂/MWh) with increased investment in clean energy resources. The state’s current standards are stronger than the EPA’s assumptions, illustrated by the shaded green bar. The right-hand bar represents pollution reductions if Illinois strengthens its efficiency standard to 20 percent by 2025 and its RPS to 35 percent by 2030.



Illinois is well positioned to meet its Clean Power Plan target by increasing its commitment to energy efficiency and renewable energy. In fact, as shown in Figure 4, the state can reach its final 2030 target by achieving its existing policy goals, and it has the opportunity to go further.²⁵ Illinois should raise its energy efficiency target to achieve a 20 percent reduction in electricity demand by 2025 and strengthen its renewable portfolio standard to 35 percent by 2030. These commitments will create 32,000 jobs in the state and will send a strong signal that Illinois presents a great investment opportunity.²⁶ In addition to these economic benefits, Illinois would lower its carbon pollution rate 9 percent below the EPA’s final target and would reap even greater climate and health benefits.

Investment in energy efficiency and renewable energy is the key to Illinois’s pollution reductions and clean energy future.

STATES CAN CHOOSE FROM A RANGE OF POLICY APPROACHES

A smart, effective, and forward-looking Illinois plan can reduce market barriers that may hinder the development of clean energy. Table 1 shows the policy options available to states under the flexibility provided by the EPA’s Clean Power Plan and offers recommendations for how states can achieve economic and environmental benefits as they cut carbon pollution. The Clean Power Plan also provides states the option to pursue partnerships with other states to reduce carbon pollution. Table 1 addresses the option of regional approaches, which present a number of potential advantages over single-state plans such as consumer savings, reduced compliance costs, increased flexibility, and avoided electricity market distortions.

CONCLUSION

Illinois leaders have an opportunity to chart a clean energy future. Under the proposed Clean Power Plan, states have incredible flexibility to design their own best, most cost-effective plan to cut carbon pollution. Energy efficiency is the lowest-cost resource Illinois can use to both cut carbon pollution and create thousands of new, homegrown jobs.

Illinois’s energy future rests in its own hands. Illinois will need to submit an initial state plan to the EPA in 2016 to demonstrate how it will reduce carbon emissions from its power plant fleet. The Clean Power Plan presents Illinois with the opportunity to improve public health, foster new economic development, and help stabilize our climate.

TABLE I. STATE POLICY OPTIONS FOR CLEAN POWER PLAN COMPLIANCE.

States have ample flexibility under the Clean Power Plan to choose the best method to reduce pollution.

	Flexible Intensity-based	Mass-based with Trading	Carbon Fee	Portfolio/Resource Standards
Environmental Goal, Units, & Outcome	State has emissions intensity goal in pollution per unit of electricity generated (lbs/MWh)	State has emissions limit in total, fixed amount (tons), regardless of amount of electricity generation	State establishes a carbon fee (\$/ton) at price estimated to deliver the emissions goal; price is fixed but emissions outcome is uncertain	State sets minimum requirements for efficiency and renewable resources at levels estimated to deliver the emissions goal
Market Structure & Trading	Fossil power plants that pollute above the intensity standard must buy credits from others that operate below the standard	State agency issues allowances (tons) equal to the emissions limit; allowances can be auctioned or allocated; fossil power plants have to hold an allowance for every ton of emissions	State agency estimates the carbon fee (\$/ton) needed to achieve the emissions goal; revenue could be returned to utility customers through rebates, energy efficiency investments, or other state goals	Eligible resources are identified (i.e., efficiency and renewables) and energy (MWh) is tracked using generator certificate tracking systems; the distribution utilities need enough certificates to show they are meeting the required standard
Electric System Reliability	All of these market-based approaches provide significant flexibility for plant operators, grid operators, and regulators to ensure that reliability requirements are met. If a plant is needed in the short term it can keep operating by buying allowances or credits or by paying a fee. A unit could be designated as “must-run” for reliability reasons until the reliability constraint is addressed, and other facilities would adjust their performance to accommodate the output from that plant.			
Regional Approaches	<p>There are significant benefits associated with states pursuing consistent regional approaches to compliance. The primary benefits are:</p> <ol style="list-style-type: none"> 1) LOWER COST—A larger market should be more efficient and reduce costs 2) EQUAL TREATMENT—Generators, market participants, and consumers should face consistent market signals, costs and benefits 3) IMPROVED ENVIRONMENTAL OUTCOME—Regional approaches avoid different price signals across a market region and on either side of state boundaries. This would help avoid emissions leakage and higher national emissions than anticipated 4) REMOVE OR REDUCE RELIABILITY CONCERNS—A larger market and additional flexibility further reduces reliability concerns 			

ENDNOTES

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- 7 EPA, “Fact Sheet: Clean Power Plan Overview,” www2.epa.gov/carbon-pollution-standards/fact-sheet-clean-power-plan-overview, accessed December 15, 2014.
- 8 Wholesale power prices do not necessarily correlate with total compliance costs, which also include capital investments. Energy efficiency and renewable energy require capital investments but lower the overall fuel and operating costs of the electricity system, and correspondingly can suppress wholesale power prices. This effect, along with smarter energy use, leads to the EPA’s finding of overall bill savings as a result of the proposed rule.
- 9 In NRDC’s analysis, performed prior to the release of the Clean Power Plan, Illinois’s 2020 and 2025 carbon pollution targets were 1,479 and 1,191 lbs/MWh, respectively, whereas the EPA’s proposed interim (2020–2029) average target is 1,366 lbs/MWh. However, the targets are not directly comparable; for example, in the NRDC analysis new sources were covered under the standard, whereas in the EPA proposal they are not covered. At the national level, NRDC’s proposed targets were more ambitious, resulting in a 36 percent reduction in CO₂ emissions below 2005 levels by 2020.
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- 24 Rebecca Stanfield, "Illinois Is Ahead of the Curve on Meeting Power Plant Standards," NRDC Switchboard, June 2014, switchboard.nrdc.org/blogs/rstanfield/this_wednesdayschicago_tribune.html.
- 25 In this chart, the EPA's rate calculation methodology was followed: Efficiency and renewable generation were added to the denominator without reducing emissions in the numerator. In practice, these clean energy resources would also displace fossil generation and corresponding emissions, but that was beyond the scope of this analysis.
- 26 Illinois Science & Technology Institute, "Project Focus: The Impact of Energy Policy on Illinois Jobs," February 2015.