

The Clean Power Plan: Green and Affordable

With a 30 percent reduction in emissions from U.S. power generation compared to 2005 levels, households' average electric bills are \$17 per month lower in 2030. Cleaner electricity is less expensive for consumers.

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Reducing Both Emissions and Bills

As state agencies and other stakeholders begin to explore options for compliance with the Environmental Protection Agency's (EPA) Clean Power Plan, critical questions are emerging regarding the costs of compliance to consumers and the role of energy efficiency in reducing both emissions and bills. Synapse modeled various compliance options to determine how big an impact strong energy efficiency policies can have on the achievability and affordability of Clean Power Plan compliance.

Doing the Math on Compliance

The Clean Power Plan requires states to meet targets that together would reduce national electric sector emissions to about 30 percent below 2005 levels. States may choose to comply with a mass-based target (a cap on total emissions in tons) or a rate-based target (a maximum emission rate in pounds per megawatt-hour). It is up to each state's policymakers and other stakeholders to determine how best to achieve the required emission reductions.

Synapse modeled both a business-as-usual reference scenario (called "Not-CPP-Compliant"), in which no actions are taken to achieve Clean Power Plan compliance, and a scenario in which all states are engaged in trading to meet a mass-based emissions cap that includes new sources (called "Synapse-CPP"). Our Synapse CPP compliance scenario includes strong investment in energy efficiency in every state. We found that complying with the Clean Power Plan lowered costs for electricity consumers in this scenario (see Figures 1 and 2). With a least-cost approach to Clean Power Plan compliance, the average U.S. household could see bill savings of \$17 per month in 2030, compared to their costs in 2030 without compliance.

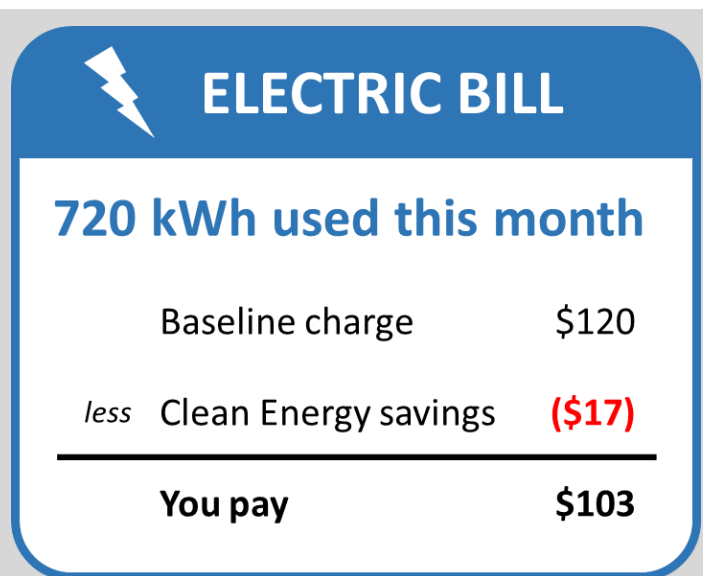


Figure 1. Illustrative 2030 monthly electric bill for the average U.S. household

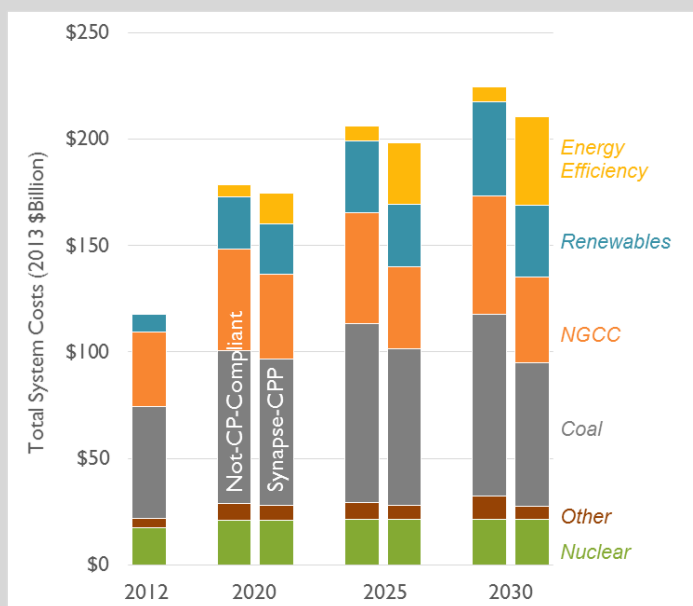


Figure 2. U.S. costs in the Not-CPP-Compliant and Clean Power Plan-compliant Synapse-CPP scenario

Bill Savings in Every State

The accompanying report to this factsheet, *Cutting Electric Bills with the Clean Power Plan*, presents modeling results for the 48 continental United States.

Synapse’s state-by-state modeling found that Clean Power Plan compliance resulted in utility bill savings in every state under the Synapse-CPP scenario. The states that stand to save the most money from Clean Power Plan compliance are those that have achieved little in the way of energy efficiency savings to date. States that currently have strong energy efficiency standards still see bill savings, but on a smaller scale.

For states with energy efficiency standards already in place, savings range from \$2 to \$17 per month. For states that do not currently have energy efficiency standards or other programs supporting efficiency measures, electric utility bill savings in 2030 can range up to \$44 per month. States with big bill savings also tend to have higher-than-average poverty rates. Of the eight states with the largest bill savings, five have poverty rates higher than the national average.

What Does Energy Efficiency Have to Do with the Clean Power Plan?

Energy efficiency has a critical role in meeting both rate-based and mass-based Clean Power Plan targets. For states that choose rate-based compliance approaches, the rule explicitly allows energy efficiency measures to receive a credit for each MWh of energy saved. This credit can then be sold to polluters who must meet a pounds-per-MWh rate-based target.

Some confusion persists about how energy efficiency measures can be applied to mass-based compliance. Fortunately, the answer can be summarized in two sentences:

- (1) In any situation, **energy efficiency is a cost-effective way to reduce demand for electricity**, both reducing emissions and helping to avoid or defer other mass-based compliance actions.
- (2) **States can take action to develop customized plans** to further encourage energy efficiency as a means for meeting mass-based compliance.

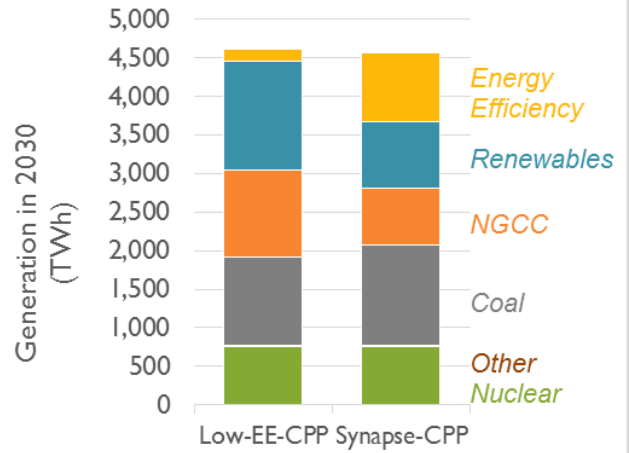


Figure 4. 2030 generation in Synapse-CPP compared to a Clean Power Plan-complaint “Low EE” scenario

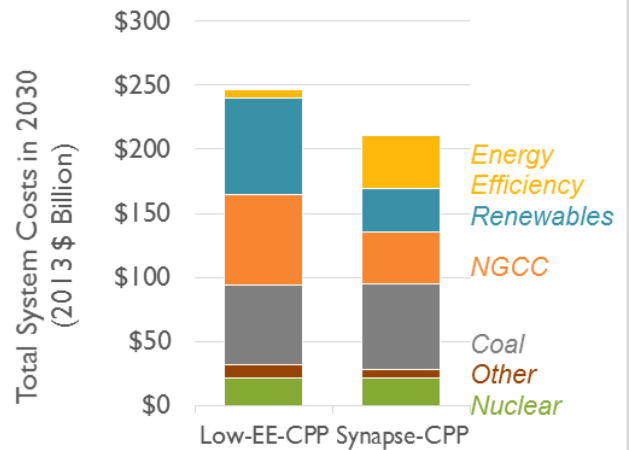


Figure 5. 2030 costs in Synapse-CPP compared to a Clean Power Plan-complaint “Low EE” scenario

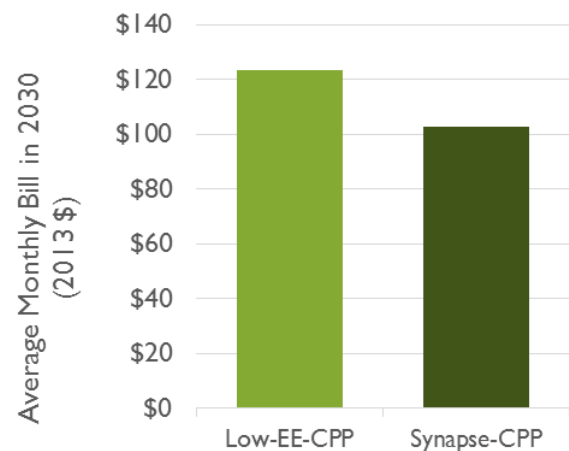


Figure 6. 2030 monthly bill in Synapse-CPP compared to a Clean Power Plan-complaint “Low EE” scenario

Under the mass-based Model Rule (i.e., the “off-the-shelf,” approvable template for states that do not want to create an optimized plan) there is no automatic direct incentive for energy efficiency, unless states choose to create one. In states that choose mass-based compliance, polluters must possess an emissions allowance (measured in tons of CO₂) for each ton they plan to emit. Each state’s total number of allowances—aggregated across all emitting units—may not be greater than its target. If demand for electricity is lower as a result of energy efficiency savings, polluters will be called upon to generate less electricity, emissions will fall, and the statewide emissions cap will be more easily achieved.

How Much Difference Does Energy Efficiency Make?

In addition to our Synapse-CPP scenario with strong energy efficiency investment that reaches 3 percent annual incremental efficiency savings in every state, we analyzed a second Clean Power Plan compliant scenario—called “Low-EE-CPP” that assumes minimal levels of energy efficiency investment. States with existing efficiency savings targets meet them, but all other states cease energy efficiency investments in 2015.

Figures 4, 5, and 6 compare the results of the Synapse-CPP strong efficiency compliance and the Low-EE-CPP compliance scenarios. Because of energy efficiency savings, power generation can be reduced while maintaining the same level of energy services in both scenarios. Total electric system costs are 17 percent lower in the Synapse CPP scenario: efficiency savings are cheaper than any other resource. Average household electric utility bills are \$21 less expensive each month than they would be if Clean Power Plan compliance were met with less energy efficiency.

Including Cost-Effective Energy Efficiency in the Clean Power Plan

There are several strategies for getting direct credits for

energy efficiency in mass-based approaches. The mass-based Model Rule of the Clean Power Plan suggests allocating up to 5 percent of allowances to low-income energy efficiency measures for use in the first few years of compliance.

States, however, can choose a mechanism that provides stronger incentives to new energy efficiency measures:

States can give allowances directly to those providing efficiency measures. If states file their own implementation plan, they have the freedom to adjust the annual allocation of new allowances. For example, states could simply hand some number of allowances over to energy efficiency providers in return for creating new efficiency programs. The providers can then sell allowances to polluters, generating revenue and offsetting the costs of installing new lightbulbs, insulation, and energy-efficient appliances.

States can auction allowances and give the revenues to efficiency providers. Instead of handing over allowances to efficiency providers, states could instead pay the providers directly using revenues generated from allowance auctions. Rather than using a “free allocation” method, some states pursuing mass-based compliance may choose to auction allowances to polluters. The revenue raised in these auctions could be used to fund energy efficiency programs. For example, the Northeast’s Regional Greenhouse Gas Initiative (RGGI) has auctioned allowances and funded efficiency in just this way since 2009. In 2014 alone, \$367 million were raised in the RGGI auction. The lion’s share of this was redistributed to energy efficiency, thereby reducing the costs of the electric system for all consumers.

For years we’ve known that energy efficiency is one of the most cost-effective ways to reduce and avoid emissions from generators. That story hasn’t changed, and the Clean Power Plan provides significant flexibility to states to harness this resource. It is up to each state to decide whether or not to file a plan that encourages energy efficiency as a means to cost-effectively achieving the statewide cap on emissions.

Methodology and Assumptions

Synapse modeled these scenarios using the Regional Energy Deployment System (ReEDS) model developed by the National Renewable Energy Laboratory (see Table 1 for a brief overview of assumptions). In Synapse’s analysis, costs to supply electricity include the variable costs of fuel and operations, leveled capital costs of new investments in generation and transmission, energy efficiency and solar rooftop program costs, the costs of

purchasing power from other states (or the revenues from selling power), the costs (or revenues) of CO₂ compliance trading, the sunk costs of previous investments (whether still in use or not), the cost of environmental retrofits, and the cost of distributing electricity to customers. For a report detailing this brief’s methodology, assumptions, and results, see synapse-energy.com/cutting-electric-bills-with-clean-power-plan.

	Not CPP Compliant	Low EE CPP	Synapse CPP
Energy Efficiency	States comply with existing efficiency standards; states without standards are assumed to implement no additional energy efficiency	States implement minimal energy efficiency	States reach 3 percent annual incremental energy efficiency savings by 2029 based on Massachusetts’ current plan
Renewables	States comply with existing renewable energy standards at minimum	States comply with existing renewable energy standards at minimum	States comply with existing renewable energy standards at minimum
Gas and oil	Net 14 GW new NGCC capacity built by 2030	Net 19 GW new NGCC capacity built by 2030	Net 7 GW new NGCC capacity built by 2030
Coal	Coal plant retirements limited to announcements to date	Coal plant retirements limited to announcements to date	Coal plant retirements limited to announcements to date
	Environmental controls installed per current regulations	Environmental controls installed per current regulations	Environmental controls installed per current regulations
Nuclear	All nuclear units operate for 60-year lifetimes	All nuclear units operate for 60-year lifetimes	All nuclear units operate for 60-year lifetimes
Carbon Caps and Trading	RGGI states and CA must meet CO ₂ emissions caps from existing programs; no caps in other states	RGGI states and CA must meet CO ₂ emissions caps from existing programs; other states must meet CPP mass-based cap covering new and existing resources	RGGI states and CA must meet CO ₂ emissions caps from existing programs; other states must meet CPP mass-based cap covering new and existing resources
	RGGI states trade allowances among themselves	RGGI states may only trade allowances with one another; all other states trade together in a single market	RGGI states may only trade allowances with one another; all other states trade together in a single market

Table 1. Synapse assumptions used in the ReEDS modeling

ABOUT SYNAPSE

Synapse Energy Economics, Inc. is a research and consulting firm specializing in energy, economic, and environmental topics. Since the Clean Power Plan was proposed in June 2014, Synapse staff have been actively analyzing and modeling the impacts of the rule. This work includes analyzing state-specific compliance options and providing planning support and resources to non-governmental organizations and state agencies. Synapse developed its open source Clean Power Plan Planning Tool, or CP3T, to assist state agencies and other stakeholders in planning for compliance (www.cp3t.com).

ACKNOWLEDGEMENTS

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