

Clean Power Means Lower Bills for Consumers

States that use clean energy and energy efficiency programs to comply with the Clean Power Plan can make deep cuts in carbon pollution and help save consumers money on their electric bills.

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If states comply with EPA's proposed Clean Power Plan by investing in high levels of clean energy and widespread energy efficiency, they can save \$40 billion in 2030. Analysis by Synapse Energy Economics shows that households participating in state-sponsored efficiency programs can save an average of \$35 on their monthly bills, and even non-participants can save money in 16 states.

Synapse's path to Clean Power Plan compliance (called the "Clean Energy Future") is cheaper for states and has lower bills for consumers compared to the business-as-usual alternative, and by 2030 it achieves a 58 percent reduction in electric-sector carbon pollution from 2005 levels—nearly twice the EPA's proposed target. Additional information on the Synapse analysis can be found in the first brief in this series, *Lower Electric Costs in a Low Emission Future*, and in an accompanying report to this brief (available at www.synapse-energy.com/consumer-costs-low-emissions-futures).

Electric Bill Savings

We estimate that in 2030, the average U.S. household electric bill would be \$126 per month in the absence of new investments in renewables and efficiency (see Figure 1). If two-thirds of U.S. households took advantage of energy efficiency programs under the Clean Power Plan, however, participating consumers would save \$35 per month, paying only \$91.

Participants in energy efficiency programs pay less for electricity than non-participants, even after accounting for their share of the cost of electricity-saving measures. Synapse's analysis finds that consumers who don't take advantage of efficiency programs would pay \$130 per month, only \$4 more each month than they would have

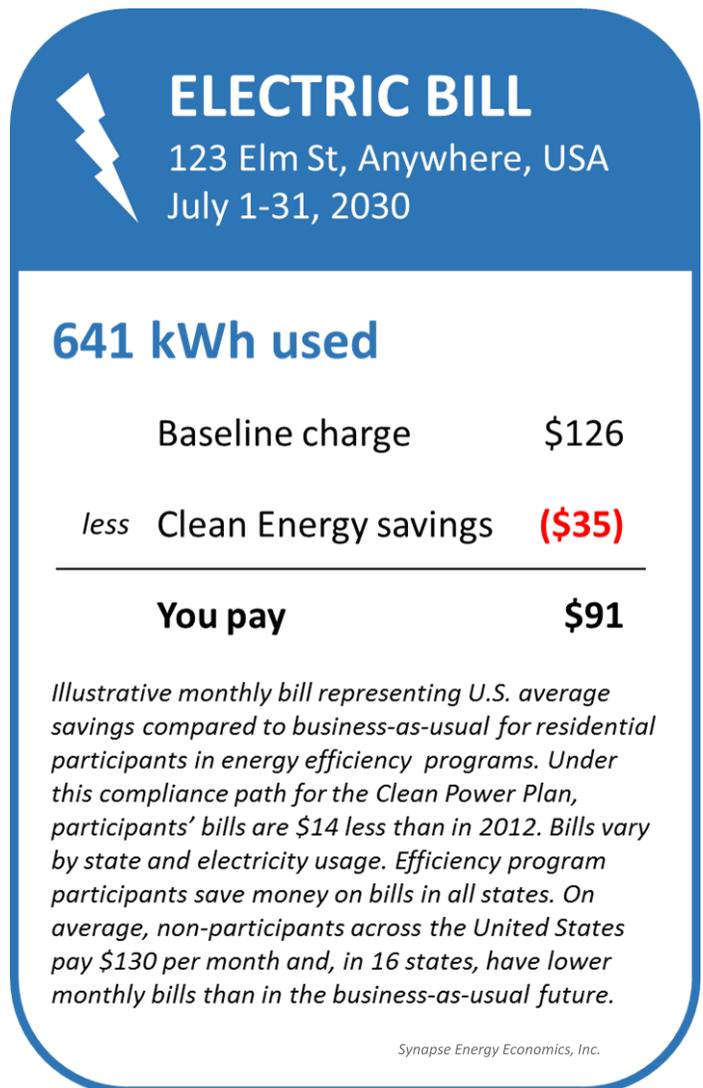


Figure 1. Illustrative 2030 monthly electric bill for average U.S. household with efficiency savings

if no new investments were made.

In this path to Clean Power Plan compliance, renewables and efficiency save money for consumers even compared to current expenses: efficiency program participants benefit the most with 2030 average monthly bills \$14 cheaper than they were in 2012.

Lower Bills in Every State

Using less power to provide the same services and lifestyle is a critical component of Synapse’s Clean Power Plan compliance scenario. Each state achieves incremental energy efficiency savings of 2 percent per year by 2029. This level of savings is ambitious, but well within reach. Rhode Island, Massachusetts, Vermont, Arizona, and Hawaii already have annual incremental savings at or approaching 2 percent in 2015, and have been achieving high levels of savings for years.

By 2030, we assume that two-thirds of U.S. households participate in energy efficiency programs in the Synapse compliance scenario. In eight states, more than 90

On average, customers participating in energy-saving programs save \$35 on monthly bills in 2030. percent of households participate. Compared to business-as-usual, households that participate in efficiency programs save on bills, with monthly savings

ranging from \$0.50 in Kansas up to \$94 dollars in North Dakota (see Figure 2). Even non-participants’ bills fall in 16 states, with the nationwide average non-participant household in the compliance scenario seeing bills that are just \$4 higher than in the business-as-usual future.

For efficiency program participants in 42 of the lower 48 states, bills are lower in 2030 than in 2012. Monthly bills are less than \$2.50 higher in 2030 than in 2012 in Kentucky, Maryland, North Carolina, New Mexico and Virginia, and \$4 higher in Rhode Island. Monthly bills could be lowered further by increasing participation and efficiency savings (see Figure 2).

Customers typically see the largest savings in states that build renewables early on and become net exporters of electricity. These first movers save more money than states that operate fossil fuel power plants well into the future, which then become importers once these plants retire.

Overall, clean energy and efficiency investments can save money for a majority of households in every state.

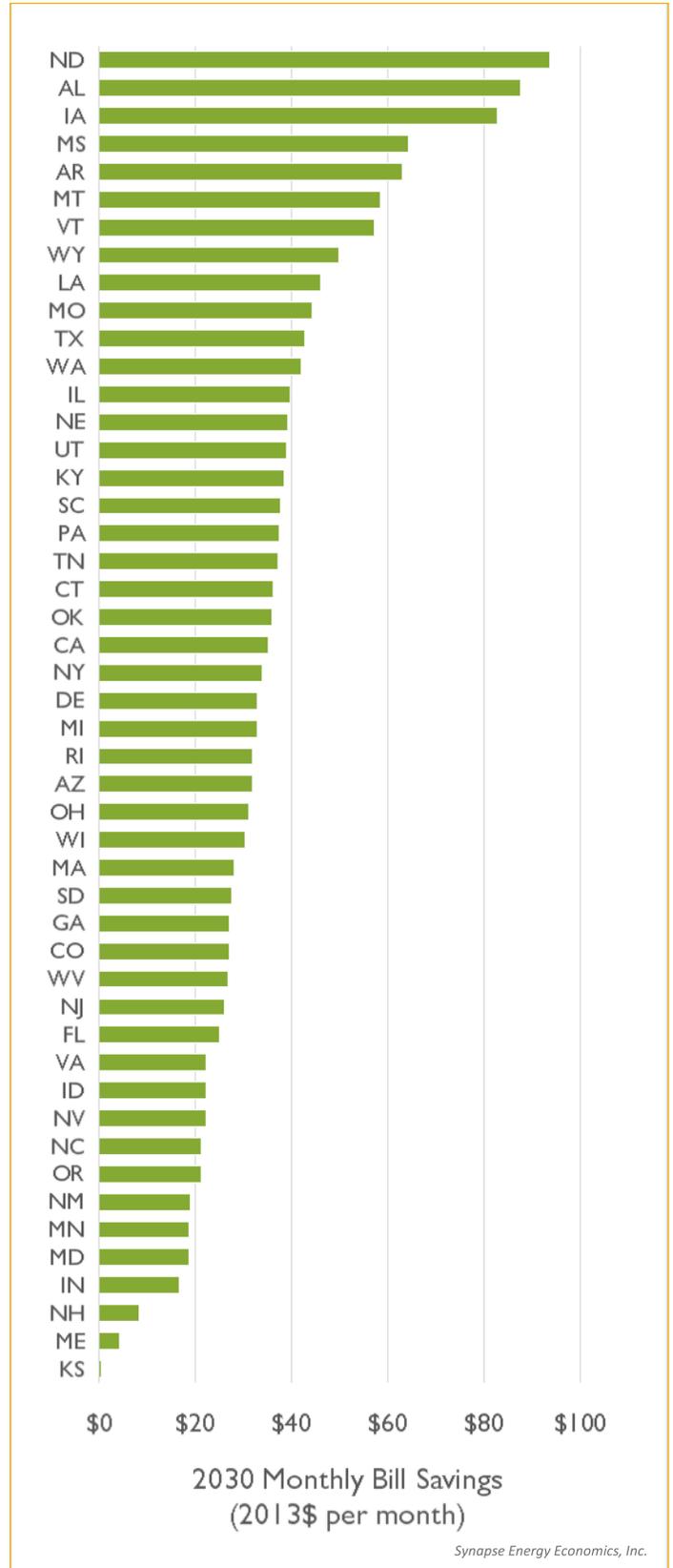


Figure 2. Monthly electric bill savings for average household participating in efficiency programs in 2030

Clean Power Plan Compliance

EPA's proposed Clean Power Plan requires states to keep electric-sector carbon pollution below either an emission rate (measured in pounds per megawatt-hour) or a cap of total tons emitted. These CO₂ limits are designated based on EPA's estimate of each state's capacity to cost-effectively reduce emissions from fossil fuel generation.

Figure 3 shows 2005 total electric-sector emissions for each state (in light grey) and EPA's proposed emissions cap in millions of metric tons of CO₂ (shown as vertical black lines). On average nationwide, the proposed Clean Power Plan calls for a 30 percent reduction in electric-sector CO₂ emissions by 2030.

All states modeled comply with EPA's proposed targets under this pathway to Clean Power Plan compliance.

In the Synapse path to Clean Power Plan compliance, many states' CO₂ emissions are even less than their EPA targets (that is, they "over-comply"). For example,

Texas' Clean Power Plan target for 2030 is 159 million metric tons of CO₂. With investments in efficiency and renewables in Synapse's compliance scenario, Texas emits just 105 million metric tons (shown in yellow).

All states modeled comply with EPA's proposed Clean Power Plan in 2030. Arizona, Minnesota, Mississippi, and Utah require some trading with other states in order to comply with EPA's proposed rule in 2030. Because of other states' over-compliance, renewable energy certificates or other compliance trading credits are plentiful and, therefore, inexpensive. We include these trades' impacts on both rule compliance and consumer bills throughout our analysis.

In the years leading up to 2030, the United States as a whole meets EPA's 2020-2029 interim targets, but 15 states require some trading to achieve compliance. As in 2030, available compliance credits would greatly exceed the demand for these credits, and therefore, the expected cost of these trades is small.

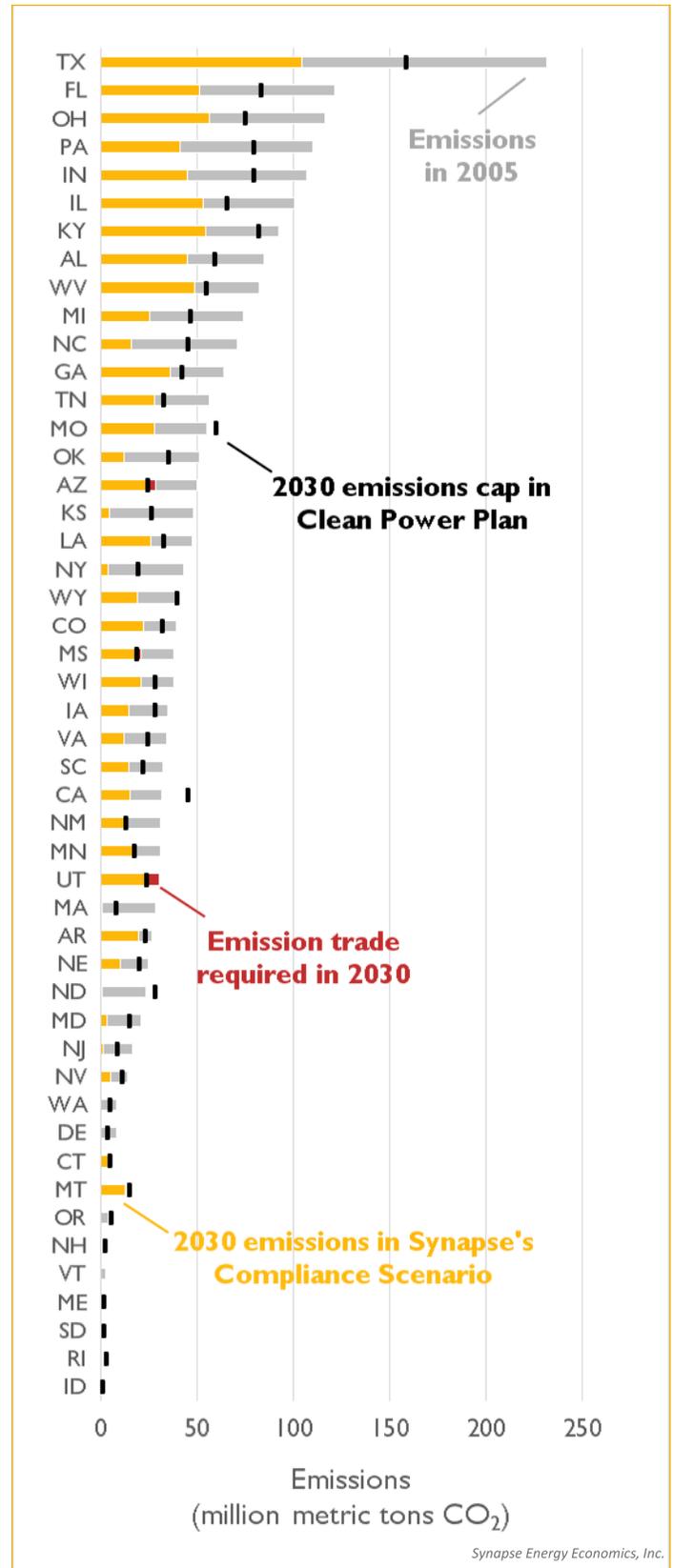


Figure 3. CO₂ emissions (Clean Power Plan target and Synapse compliance scenario) in 2030 compared to 2005

Methodology and Assumptions

The scenario for compliance with the Clean Power Plan (“Clean Energy Future” scenario) and the business-as-usual case (the “Reference” scenario) were modeled using ReEDS (see Table 1 for scenario assumptions). ReEDS is a national, long-term capacity expansion and dispatch model built by the National Renewable Energy Laboratory. These scenarios were then analyzed for Clean Power Plan compliance using Synapse’s Clean Power Plan Planning Tool (available at www.cp3t.com).

In Synapse’s analysis, electric costs to supply energy 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 those consumers not participating in energy efficiency programs, the per-kilowatt-hour cost of supply is then multiplied by each state’s average monthly residential usage to estimate a monthly bill. We assume participants reduce usage by an average of 30 percent per month through energy efficiency.

For a report detailing this brief’s methodology, assumptions, and results, see www.synapse-energy.com/clean-power-plan-means-lower-bills-report.

	Reference Scenario	Clean Energy Future Scenario
Energy Efficiency	Existing federal appliance and building standards, minimal state efficiency policies	Incremental efficiency savings of 2% each year by 2029
Renewables	Renewables comply with existing state laws	70% of generation from renewable resources by 2040
Gas	Net 24 GW new gas-fired capacity built by 2040	Net 78 GW gas-fired capacity retired by 2040
Coal	Coal plant retirements limited to announcements to date	All coal plants built before 2005 retired by 2040
Other	No electric vehicles integrated as electric-grid storage	25% of cars and trucks integrated as electric-grid storage by 2040
	Demand response reaches 10% maximum sales by 2040	Demand response reaches 15% maximum sales by 2040
	13 GW new storage resources by 2040	51 GW new storage resources by 2040
Hydro	10 GW new run-of-river and improved capture of hydro resources by 2040	18 GW new run-of-river and improved capture of hydro resources by 2040
Nuclear	All nuclear units operate for 60-year lifetimes	All nuclear units operate for 60-year lifetimes

Table 1. Comparison of Reference and Clean Energy Future scenario assumptions

This brief is the second in a series exploring the impacts of the proposed Clean Power Plan on consumers. After the release of the final Clean Power Plan later this summer, we will provide updated analysis. For information on how to sign up for webinars on these briefs see www.synapse-energy.com/project/consumer-costs-low-emissions-futures.

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).

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