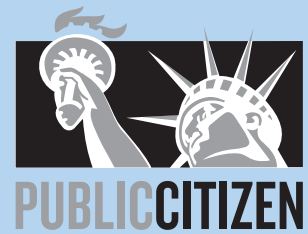# CLEAN POWER, CLEAR SAVINGS

PUBLICCITIZEN

VIRGINIA

The EPA Clean Power Plan Will Cut Virginia Electricity Bills by 7.7 to 8.4 Percent by 2030

Acknowledgments

About Public Citizen

Public Citizen is a national non-profit organization with more than 400,000 members and supporters. We represent consumer interests through lobbying, litigation, administrative advocacy, research, and public education on a broad range of issues including consumer rights in the marketplace, product safety, financial regulation, worker safety, safe and affordable health care, campaign finance reform and government ethics, fair trade, climate change, and corporate and government accountability.

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Introduction

This summer, the Environmental Protection Agency (EPA) expects to finalize its first-ever rule to curb carbon pollution from existing power plants, known as the Clean Power Plan.[1] This report finds that the EPA rule should lower Virginia electricity bills substantially, and that the state can and should do even better.

Detractors often argue that EPA proposal will raise electricity rates. That claim focuses on the wrong question from the standpoint of electricity customers. For a consumer or business focused on costs, the key question is what effect the Clean Power Plan will have on what they actually pay, which means electricity *bills*. Although the EPA projects that the retail price of electricity will rise modestly under the Clean Power Plan compared to a business-as-usual scenario, it also expects the rule to spur improvements in energy efficiency so that people use less electricity. The net result is that electricity bills will fall, not rise.

The EPA estimates that, in addition to mitigating climate change and boosting public health, the proposed Clean Power Plan will lower electricity bills nationwide by 8.4 percent by 2030 compared to a business-as-usual scenario.[2] The agency did not conduct a state-by-state analysis of bill impacts. For this report, Public Citizen analyzed data from the EPA and the U.S. Energy Information Administration (EIA) to project the Clean Power Plan's effect on electricity bills in Virginia.[3] We find that by 2030, electricity bills will be 7.7 to 8.4 percent lower under the Clean Power Plan, saving the average Virginia household $135 to $147 annually. Moreover, these numbers are likely underestimates. Virginia can and should do even better. The Clean Power Plan presents a great opportunity not just to fight climate change, but to lower electricity costs for consumers.

One important caveat to this report's analysis is that actual outcomes will depend on Virginia's policy choices. State officials will decide how to comply with the Clean Power Plan, and they can adopt policies that are better or worse for Virginia's electricity customers. Energy efficiency should feature prominently in the state's compliance plan, as it is the lowest-cost way to reduce carbon emissions. It also happens to save consumers and businesses a great deal of money on their electricity bills. But the choice lies with Virginia policymakers.

This year, the Virginia enacted a law that was billed as "freezing" electricity rates.[4] This analysis does not incorporate that law. Despite being touted as a means to protect consumers from rate increases under the Clean Power Plan, the law freezes rates only through 2020, the year that the Clean Power Plan goes into effect.[5] And it only affects "base rates," which account for roughly half of the charges on an electricity bill. The law does not block rate increases to pay for infrastructure changes, for example, which are precisely the types of costs involved in complying with an anti-pollution rule. The way to benefit Virginia electricity consumers is to improve energy efficiency measures so that people use less power and, as a result, pay lower bills.

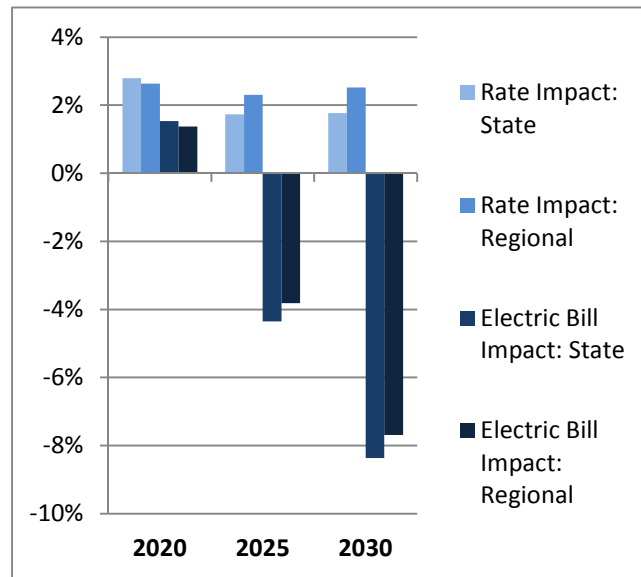## The Clean Power Plan Can Lower Electricity Bills in Virginia

The proposed Clean Power Plan aims to cut carbon pollution from power plants by 30 percent from 2005 levels by 2030. Under the plan, the EPA will set a carbon-reduction target for each state, and

then states can decide how to meet their targets.[6] They can comply individually or in regional groups, and they can use a mix of different strategies, like improving the efficiency of existing coal-fired power plants, shifting some electricity generation from coal to natural gas plants, shifting to renewables or nuclear generation, and using energy efficiency to reduce electricity consumption. Energy efficiency should also play a major role, as it is the lowest-cost and most effective strategy for reducing carbon pollution by a wide margin.

Improving energy efficiency means using less electricity to do the same or more work. For example, better insulated homes require less power to heat and cool. There are many other ways to improve efficiency, ranging from switching to more efficient appliances and light bulbs to using combined heat and power (CHP) systems in industrial processes to generate electricity and usable heat in a combined system rather than independently.[7] Efficiency gains are usually so inexpensive that they pay for themselves quickly in reduced electricity costs. A 2014 study by the American Council for an Energy-Efficient Economy (ACEEE) found

Figure 1: Estimated CPP Impacts on Retail Rates and Total Electricity Bills in Virginia

that energy efficiency programs run by utilities return $1.41 to $4 for every dollar spent.[8] For this reason, even if the retail price of electricity increases modestly under the Clean Power Plan, households and businesses will use substantially less electricity due to efficiency measures, and their bills will still decline.

Figure 1 illustrates the projected retail electricity rates and total electricity bills in Virginia under the Clean Power Plan, expressed as percentage changes from a business-as-usual baseline. The EPA's data suggests that the price of electricity will rise only slightly under the Clean Power Plan. If Virginia complies individually, then retail rates will be 2.8 percent higher than business-as-usual in 2020, then just 1.7 percent higher in 2025 and 1.8 percent higher in 2030.[9] If the state complies in a regional group, then the EPA's data suggests that the retail price of electricity will be 2.6 percent higher than business-as-usual in 2020, 2.3 percent higher in 2025, and 2.5 percent higher in 2030.[10] In either case, our analysis of EPA data suggests that electricity *consumption* in Virginia will decline by 1.2 percent in 2020, 6 percent in 2025, and 10 percent in 2030.[11]

The net effect is that thanks to efficiency measures, electricity bills will rise in 2020 by just 1.4 to 1.5 percent and then decline going forward. In 2025, they will be 3.8 to 4.4 percent lower than business as usual. By 2030, electricity bills will be 7.7 to 8.4 percent lower than they would be in the absence of the Clean Power Plan.[12]

Figures 2(a) and 2(b) illustrate the effects of these changes on annual household expenditures, expressed in dollars. We estimate that the average household will see annual electricity bills rise by $22 to $24 in 2020, then decline by $64 to $73 in 2025 and $135 to $147 in 2030 compared to business-as-usual.[13] In other words, the typical household would pay $1,762 for electricity in 2030 without the Clean Power Plan, but would pay $1,615 to $1,627 under the rule.[14]

Figure 2(a): Projected Change in Annual Household Electric Bills in Virginia Under the CPP

Virginia Can and Should Save More Than This Analysis Indicates

The estimated cost reductions in this report are likely understated. This analysis is based on a compliance path that the EPA proposed for Virginia in the Clean Power Plan, but the state has the flexibility and capability to use substantially more efficiency than the EPA envisions. The agency's plan omits entire categories of efficiency measures that states can use, such as building codes and appliance standards.[15] It also assumes that states will ramp up their electricity savings rates relatively slowly and that no state will exceed 1.5 percent annual savings even though eleven states have already set higher targets.[16]

A recent ACEEE analysis shows one way Virginia could do better on efficiency. It finds that the state could enact a broader set of energy efficiency policies that by 2030 would save electricity customers $2 billion in 2030 alone,[17] as they would use 19,605 fewer gigawatt hours of electricity.[18] This scenario involves a 1.5 percent savings target, like EPA's, but it adds building codes, combined heat and power, and energy efficiency standards for five products.[19]

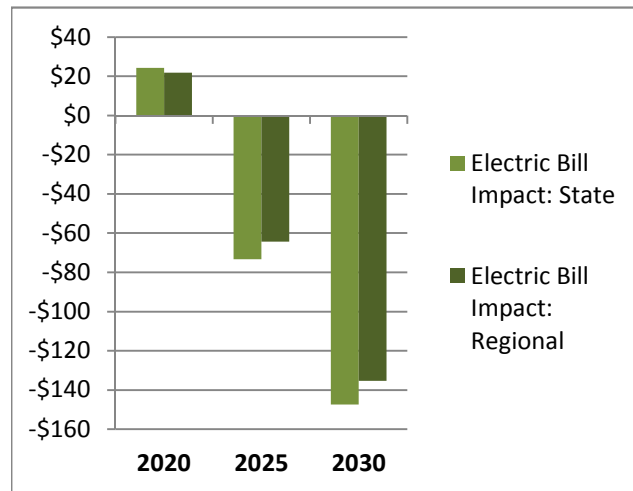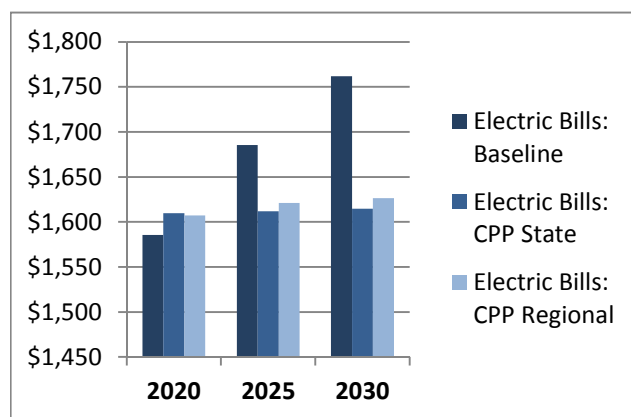A second reason why this report likely underestimates the potential savings under

Figure 2(b): Projected Annual Household Electric Bills in Virginia Under the CPP and Business-as-Usual

the Clean Power Plan is that it relies on EPA's excessively high estimates of the cost of efficiency programs. The agency starts its analysis by treating efficiency measures as 60 to 100 percent more expensive than the evidence indicates, using in the EPA's own words, a "conservative" cost estimate for efficiency programs that is higher than the costs indicated by the "up-to-date, more comprehensive results" from "newer" studies.[20] Then the agency boosts the costs further by assuming that they escalate dramatically as the rate of energy efficiency savings increases.[21] This assumption is no more obvious than the opposite one, that efficiency becomes cheaper due to economies of scale, increased experience with efficiency measures or other factors. To support its assumption, the EPA relies on a single study that actually rejects the EPA's interpretation, stating, "These findings *cast doubt* on the hypothesis that programs with higher electricity savings levels are associated with higher CSE [cost of saved energy] values."[22] In short, EPA's cost estimates for efficiency are—as the EPA stated multiple times in its proposal—"notably conservative."[23] Virginia will likely make efficiency gains at much lower cost than the EPA projects, which means even greater savings for electricity customers.

Conclusion

The Clean Power Plan offers Virginia a great opportunity not just to curb climate change, but to lower electricity bills. We project that if the state follows the possible course envisioned by the EPA, then annual electricity bills will fall by 7.7 to 8.4 percent by 2030, which amounts to $135 to $147 in annual savings for the average household. These numbers are likely too low, as they incorporate the EPA's admittedly conservative take on energy efficiency. Virginia can and should choose to exceed the EPA's expectations. Stronger improvements in energy efficiency will lead to even lower electricity costs for Virginia consumers and businesses.

Methodology

This study relies principally on the EPA's analysis of its proposed Clean Power Plan. The EPA has proposed two possible sets of state targets, which it calls Option 1 and Option 2, and it envisions that states might comply individually or in regional groups. Therefore, it analyzed four potential scenarios, in which states meet Option 1 or Option 2, individually or regionally. This study considers only Option 1, the stronger of the two sets of targets, but it analyzes both the individual state compliance scenario (termed "State" in charts) and the regional cooperation scenario (termed "Regional" in charts).

Household consumption. EPA provides business-as-usual ("BAU") sales data for the years 2012 through 2040, using 2012 historical data and making projections forward.[24] We use EPA's BAU sales estimates for the years 2020, 2025 and 2030 as the baseline figures for electricity consumption in Virginia. To calculate average household electricity consumption, we begin with EIA data on household electricity consumption in 2013.[25] EIA's household data does not include projections of future consumption. We develop household BAU values for 2020, 2025 and 2030 by adjusting the 2013 household consumption figure proportionately to the growth in EPA's aggregate BAU sales data for those periods. In other words, we assume that household electricity consumption will rise or fall at the same rate as general consumption.

To calculate household consumption under the Clean Power Plan, we use the EPA's projections of Virginia's cumulative energy efficiency savings for each year to modify the estimates for household consumption.[26]

Household costs. For each Electricity Market Module (EMM) region, the EPA's Regulatory Impact Analysis provides an estimate of electricity rates in the base case and under each compliance scenario for the years 2020, 2025 and 2030.[27] Virginia encompasses portions of four regions: SERC Reliability Corporation Virginia-Carolina (SRVC), Reliability First Corporation West (RFCW), SERC Reliability Corporation Central (SRCE), and Reliability First Corporation East (RFCE).[28] The EPA's analysis treats electricity rates as the same across each region, and this report follows the EPA in that regard.

To calculate average rates for Virginia as a whole, we weight each region's rate projection by its proportion of state electricity sales on the EIA's 2012 form 861 (this is the sales data that the EPA uses).[29] SRVC accounts for 80.1 percent of sales, while RFCW accounts for 17.9 percent, SRCE for 1.4 percent, and RFCE for 0.8 percent. To calculate household costs for each scenario, we multiply our estimate of household consumption by these projected electricity rates.

The following table contains the numbers represented in this report's illustrations:

	Rate Impact: State	Rate Impact: Regional	Electric Bill Impact: State	Electric Bill Impact: Regional	Electric Bill Impact: State	Electric Bill Impact: Regional	Electric Bills: Baseline	Electric Bills: CPP State	Electric Bills: CPP Regional
2020	2.8%	2.6%	1.5%	1.4%	$24.28	$21.74	$1,585.52	$1,609.80	$1,607.26
2025	1.7%	2.3%	-4.4%	-3.8%	-$73.33	-$64.31	$1,685.32	$1,611.99	$1,621.01
2030	1.8%	2.5%	-8.4%	-7.7%	-$147.31	-$135.38	$1,761.97	$1,614.66	$1,626.59

ENDNOTES

[1] EPA, *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Proposed Rule*, 79 FED. REG. 34,830 (June 18, 2014).

[2] EPA, REGULATORY IMPACT ANALYSIS FOR THE PROPOSED CARBON POLLUTION GUIDELINES FOR EXISTING POWER PLANTS AND EMISSION STANDARDS FOR MODIFIED AND RECONSTRUCTED POWER PLANTS 3-43 (2014) (hereinafter RIA).

[3] In February 2015, Public Citizen and the Virginia Citizens Consumer Council released a report focused on the "rate freeze" bill that was pending in the Virginia legislature at the time. *See* PUBLIC CITIZEN AND VIRGINIA CITIZENS CONSUMER COUNCIL, RATE FLEECE (2015), http://www.citizen.org/documents/virginia-dominion-power-rate-fleece-report-february-2015.pdf. That report cited bill projections by ICF International. This report's analysis differs from ICF's in two ways: This report uses projections of Virginia electricity sales rather than electricity generation as a proxy for consumption, and it projects not just the percentage change in bills, but also the dollar value of that change.

[4] *See, e.g.*, Jacob Geiger, *Governor Signs Bill to Freeze Dominion Rates, Suspend Reviews*, RICHMOND TIMES-DISPATCH, Feb. 24, 2015, http://www.richmond.com/business/local/article_b356b0cb-473d-5cb0-ad1c-6c5a076d45c1.html.

[5] *See id*.

[6] 79 FED. REG. at 34,832.

[7] CHP systems, used most commonly in the steel, chemical, paper, and petroleum-refining industries, are vastly more efficient than generating electric power and heat separately. *See* ACEEE, COMBINED HEAT AND POWER AND CLEAN DISTRIBUTED ENERGY POLICIES 1 (2009).

[8] ACEEE, THE BEST VALUE FOR AMERICA'S ENERGY DOLLAR: A NATIONAL REVIEW OF THE COST OF UTILITY ENERGY EFFICIENCY PROGRAMS 24 (2014) (hereinafter BEST VALUE).

[9] RIA at 3-40–3-42.

[10] Public Citizen analysis of EPA data. For the methodology, see the final section of this report.

[11] Public Citizen analysis of EPA data.

[12] Public Citizen analysis of EPA data.

[13] Public Citizen analysis of EPA and EIA data.

[14] Public Citizen analysis of EPA and EIA data.

[15] *See* ACEEE, CHANGE IS IN THE AIR: HOW STATES CAN HARNESS ENERGY EFFICIENCY TO STRENGTHEN THE ECONOMY AND REDUCE POLLUTION 7 (2014) (hereinafter CHANGE IS IN THE AIR).

[16] *Id*. at 8.

[17] ACEEE, CHANGE IS IN THE AIR, at 76.

[18] *Id*. at 64. ACEEE also calculates that these policies would create 13,000 jobs by 2030. *Id*. at 77.

[19] ACEEE, CHANGE IS IN THE AIR, at 4.

[20] *See* PUBLIC CITIZEN ET AL. COMMENT ON THE CLEAN POWER PLAN 10 (2014) (discussing GHG ABATEMENT at 5-51)), http://www.citizen.org/documents/public-citizen-et-al-comment-on-epa-clean-power-plan-20141201.pdf.

[21] The EPA's analysis assumes that costs increase by 20 percent as the rate of efficiency savings increases from 0.5 percent to 1 percent, and increase by another 20 percent when one boosts the savings rate to 1.5 percent. *See id*. At 9; GHG ABATEMENT at 5-53.

[22] ACEEE, BEST VALUE at 30 (emphasis added).

[23] 79 FED. REG. at 34,874:1, 34,874:3.

[24] These numbers are in the tab labeled "Intermediate Data" in the spreadsheet entitled, *Scenario 1: 1.5% savings target, 0.20%/year ramp rate, and 3% real discount rate*, at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0602-0153. For the EPA's methodology, see EPA, BACKGROUND AND DRAFT METHODOLOGY FOR ESTIMATING ENERGY IMPACTS OF EE/RE POLICIES (2014) http://epa.gov/statelocalclimate/documents/pdf/EPA%20background%20and%20methodology%20EE_RE_02122014.pdf.

[25] *See* EIA, ELECTRIC SALES, REVENUE, AND AVERAGE PRICE, Table 5A, at http://www.eia.gov/electricity/sales_revenue_price/.

[26] These estimates are on the tab labeled "Opt 1 - Cum Savings %" on the spreadsheet entitled *Data File: GHG Abatement Measures Appendix 5-4 (XLS)*, at http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-technical-documents.

[27] RIA at 3-40–3-42.

[28] RIA at 3-43.

[29] The sales numbers are in the tab labeled "F861_2012_file2" in the spreadsheet entitled, *Scenario 1: 1.5% savings target, 0.20%/year ramp rate, and 3% real discount rate*, at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0602-0153. We added utilities' EMM regions to these sales numbers using data that EIA provided to Public Citizen.