THE **COSTS** OF NEW EPA RULES TO **VIRGINIA**

THE BEACON HILL INSTITUTE
AT SUFFOLK UNIVERSITY

Thomas Jefferson Institute
for Public Policy

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Foreword

The Environmental Protection Agency (EPA) has become one of the most aggressive regulatory agencies in the federal government. In its quest to contain what its leadership sees as the threat of "global warming" or the less controversial term, "climate change," the EPA has proposed a set of regulations which will, according to many experts, significantly harm not only our country's coal industry, but the ability of those at the lower rung of the economic ladder to make their financial ends meet on a monthly basis.

This summer the EPA will publish its final regulations that will limit CO2 emissions on new and existing electricity power plants and lower the existing limits on mercury emissions from power plants. The impact of these regulations will be significant and Virginia will feel the results as will the rest of the country.

The Thomas Jefferson Institute is releasing this short study to show the impact that these new regulations will have on our state. The Virginia impact is carved from a larger report on the national impact of these same regulations that was published in January of this year. That national report is available on our website at: www.thomasjeffersoninst.org.

This report, "The Costs of New EPA Rules to Virginia," was researched and written by the economic scholars with the Beacon Hill Institute at Suffolk University in Boston. It used its respected STAMP model (State Tax Analysis Modeling Program) that the Thomas Jefferson Institute has used in the past here in Virginia.   In this case, the model estimates the impact of these new EPA regulations.

The impact of these new regulations will be huge with thousands of workers losing their jobs and scores of coal mines closing here in Virginia. Electricity prices will skyrocket – somewhere between 20-30% and some estimates point to even larger increases. And the impact on our environment – the reduction of CO2 – will be almost negligible.

Virginia will need to reduce its CO2 levels by 38% from its 2012 levels and the costs to our state's industries will be $1.7 billion by 2030. Those costs will be paid for by our citizens in higher prices. Our electric bills will increase by 25% and we will lose over 38,000 jobs that would not be lost if these EPA regulations were not implemented here in Virginia.

So what does Virginia do under these circumstances? One option will be for the General Assembly to refuse to implement a state plan under these new regulations. That approach almost passed the General Assembly in this year's session and it will come up again next January following the elections this year. It will be a major controversy next year because of the potential impact these regulations will have on Virginia.

A major legal challenge will take place immediately after these regulations are published. It will take at least two years for that court challenge to get to the United States Supreme Court. So it seems to make sense for Virginia to halt any effort to implement these new regulations until the courts decide whether they are legal under current law and under our Constitution. This will be a huge legal battle so why should Virginia spend its limited financial resources in an effort to impose new regulations that could be tossed out of court? Prudence seems to point toward taking no action at this time to implement these new regulations.

This report is presented so that our elected and non-elected leaders can have better information as they debate these new EPA regulations and how Virginia should respond. Nothing in this report is meant to influence pending legislation and this report does not necessarily reflect the opinions of the members of the Board of Directors of the Thomas Jefferson Institute.

Michael W. Thompson, Chairman & President
Thomas Jefferson Institute for Public Policy

The Cost of New EPA Rules to Virginia

Through the Environmental Protection Agency (EPA), the Obama administration has unveiled an unprecedented scope of regulation. The new regulations include CO_2 emission limits on new and existing electricity power plants and new lower limits on mercury emissions from electricity power plants.[1] The EPA aims the new rules directly at coal-fired electricity power plants, which provides 35 percent of the electricity generation in the United States.[2] The EPA rules are ambitious since coal is a dispatchable electricity source and provides the bulk of base load electricity to the nation's electric grids.

The rules for new plants would limit CO_2 emissions to 1.1 pounds (lbs.) per kilowatt hour (kWh) hour of electricity production.[3] This is less than half of the current average of 2.14 lbs. per kWh.[4] The rule on existing coal plants would set the national goal of reducing CO_2 emissions per megawatt hour of energy produced by 30% below the 2005 levels by 2030. In Virginia the goal is a reduction of 38% based on 2012 levels according to Dr. David Schnare, an environmental attorney who spent almost 30 years at EPA and now heads the Energy and Environment Legal Institute. The mercury rule would set an emissions limits range from between 0.0002 lbs. per Gigawatt hour (1,000,000 kilowatt hours) to 0.04 lbs. per Gigawatt hour.[5]

The EPA rules will force utilities to close coal-fired generation plants or adopt expensive and unproven technologies, such as carbon capture and storage.

The EPA estimates that that these new regulations will incur over $50 billion in annual costs. However, the EPA contends that many of these regulations will provide tens of billions of dollars in benefits that will more than offset these enormous costs. Most of these benefits are in terms of improved health.

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[1] Nam D. Pham and Daniel J. Ikenson, A Critical Review of the Benefits and Costs of EPA Regulations on the U.S. Economy, NDP Consulting, http://www.nam.org/~/media/423A1826BF0747258F22BB9C68E31F8F.ashx (November 2012).

[2] http://www.eia.gov/electricity/state/unitedstates/index.cfm,

[3] U.S. Environmental Protection Agency, "Regulatory Impact Analysis for the Proposed Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units (September 2013), http://www.epa.gov/ttnecas1/regdata/RIAs/EGUGHGNewSourceStandardsRIA.pdf, accessed May 8, 2014.

[4] http://www.eia.gov/tools/faqs/faq.cfm?id=74&t=11,

[5] EPA. "Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards." (December 2011), 1-6.

The EPA's cost and benefit estimates have come under criticism from a number of observers. The EPA calculations of cost tend to be much lower than industry estimates and benefit calculations are inflated.[6] The EPA analysis suffers from the following:

1. The use of decades-long amortization schedules for capital expenditures obfuscates the full financial burden that will be imposed over a short time period;

2. The failure to estimate likely macroeconomic impacts of its proposed regulations; and,

3. The mis-identification of source reduction; most of the benefits derive from co-benefits from other pollutants regulated under different rules while the primary pollutant is reduced only minimally

The cost of EPA regulations will not be experienced uniformly across all states, as states with a higher concentration of coal fired power plants will experience higher costs from the regulations. Virginia derives 35 percent of its electricity from coal. While the average retail electricity price is 9.07¢/kWh, or 28th highest in the country, the average price of electricity has jumped by 27 percent from 2007 to 2012. Not a coincidence, electricity generation from coal has dropped by 60 percent over the same period.[7]

Over the same five-year period, electricity generation using natural gas exploded in Virginia by 130 percent; at the same time, the natural gas price plunged by 39 percent. One would have expected that the drop in the price of natural gas and the shift to its use by electric utilities would have driven down electricity prices. It is likely that high demand for natural gas at times of peak electricity and heating demand cause the natural gas spot prices to soar as natural gas supply is unable to meet this elevated demand. This scenario played out in the Northeast and Midwest this past winter, when the so called Polar Vortex (a long cold spell) caused natural gas demand to soar to over $35 per million British Thermal Units (BTUs) from under $5. The problem was especially problematic in New England, where natural gas produces over 55 percent of the electricity generation capacity. [8]

The new EPA rules will further reduce, if not eliminate, the use of coal over the next 15 years and send electricity prices soaring even higher.

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[6] Ibid.

[7] Virginia Department of Mines, Minerals and Energy, 2014 Virginia Energy Plan, Section 2 - Electricity , http://www.dmme.virginia.gov/DE/LinkDocuments/2014_VirginiaEnergyPlan/8Section2Electricity.pdf, 2-7.

[8] Roger Bezdek and Frank Clemente, "Protect the American People: Moratorium on Coal Plan Closures Essential," http://instituteforenergyresearch.org/wp-content/uploads/2014/06/Protect-the-American-People.-Moratorium-on-Coal-Plant-Closures-Essential.pdf (June 2014).

In this paper, the Beacon Hill Institute at Suffolk University (BHI) estimates the costs for Virginia of these new EPA rules and the impact on the state's economy. To that end, BHI applied its STAMP® (State Tax Analysis Modeling Program) to estimate the economic effects of the EPA rules.[9] We report the dollar values in 2012 Net Present Value dollars using a 3 percent inflation rate. Table 1 displays the cost estimates and economic impact data for 2030.

Table 1: The Cost and Economic Impact of new EPA Rules on Virginia (2012 $)

Net benefits (cost)	2030
CO_2 Rule for New Power Plants (millions $)	-336
CO_2 Rule for Existing Power Plants (millions $)	-592
Utility Mercury Emissions (millions $)	-817
Total net cost to Virginia (millions $)	(1,744)
Electricity Prices (cents per kWh)	2.22
Percent change (%)	25%
Total Employment (Jobs)	-38,115
Investment ($ millions)	-515
Real Disposable Income ($ millions)	-4,451

We estimate that the CO_2 emission rule on new power plants will cost Virginia $336 million in 2030; the rule for existing plants will cost $592 million and the mercury emissions rule will cost $817 million. In total the three regulations will cost Virginia $1,744 million dollars. The regulations will drive up electricity prices in Virginia by 2.22 cents per Kilowatt hour, or 25% by 2030.

These increased energy prices would inflict significant harm on the Virginia economy. The state economy would shed 38,115 jobs by 2030. The job losses and price increases would combine to reduce real incomes as firms, households and governments spend more of their budgets on energy and less on other items, such as home goods, entertainment and clothing. As a result, real disposable income would fall by $4,451 million per year by 2030. Furthermore, annual investment in the state would fall by $515 million. The investment losses are mildly offset by the need to increase investment in other electricity technologies.

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[9] Detailed information about the STAMP® model can be found at
http://www.beaconhill.org/STAMP_Web_Brochure/STAMP_HowSTAMPworks.html and
http://beaconhillinstitute.blogspot.com/2014/05/in-defense-of-stamp-as-tax-modeling-tool.html

Conclusion

The EPA has used its rulemaking authority under the Clean Air Act to force coal to either shutdown or adopt expensive and untested technologies. These policies will have grave effects on the cost and/or the reliability of the national electricity supply.

These EPA rules are aimed at reducing CO_2 emissions from producers of coal power plants by either shutting them down or making their cost uncompetitive in the market place. If the electricity production from coal is eliminated, the diversity of the electricity supply sources will fall and become more dependent of natural gas and its price fluctuations. If the new expensive and untested carbon capture and sequestration technology is adopted electricity prices will increase.

The higher electricity costs threaten the state's industrial base. The rules proposed by the EPA would therefore inflict large negative impacts on the economy of Virginia. The state would experience significant declines in employment, wages, disposable income and investment upon implementation of the policy. Virginia policymakers need to be aware of these serious consequences that come with these EPA rules.

Methodology

BHI utilized its STAMP (State Tax Analysis Modeling Program) model to identify the economic effects and understand how they operate through a state's economy. STAMP is a five-year dynamic CGE (computable general equilibrium) model that has been programmed to simulate changes in taxes, costs (general and sector-specific) and other economic inputs. As such, it provides a mathematical description of the economic relationships among producers, households, governments and the rest of the world. It is general in the sense that it takes all the important markets, such as the capital and labor markets, and flows into account. It is an equilibrium model because it assumes that demand equals supply in every market (goods and services, labor and capital). This equilibrium is achieved by allowing prices to adjust within the model. It is computable because it can be used to generate numeric solutions to concrete policy and tax changes.[10]

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[10] For a clear introduction to CGE tax models, see John B. Shoven and John Whalley, "Applied General-Equilibrium Models of Taxation and International Trade: An Introduction and Survey," Journal of Economic Literature 22 (September, 1984): 1008. Shoven and Whalley have also written a useful book on the practice of CGE modeling entitled Applying General Equilibrium (Cambridge: Cambridge University Press, 1992).

BHI calculated the impact of the fossil fuel price increases on the price level for each of the (27) sectors of the economy within the STAMP model. Using the Energy Information Agency's (EIA) national data on GHG emissions by the residential, commercial, and industrial as well as transportation sectors; we allocated the national emissions to the STAMP sectors.[11] We then used data from the U.S. Census Bureau's Economic Census as a proxy for the size of each industry in each state relative to the national data.[12] We applied the cost of carbon, adjusted to be equivalent to 3.67 metric tons of CO2, to GHG emissions in each sector, which gives us our total cost to the economy. We converted these price increases in dollars into percentage changes based on the annual value of production in each sector.

We simulated these changes in the STAMP model as a percentage price increase on fuel to measure the dynamic effects on the state economy. The model provides estimates of the proposals' impact on employment, wages and income in Virginia. Each estimate represents the change that would take place in the indicated variable against a "baseline" assumption about the value that variable for a specified year in the absence of the cap-and-trade policy.

[11] U.S. Department of Energy, Energy Information Agency, American Energy Outlook 2009, Table 18: Carbon Dioxide Emissions by Sector and Source, Internet, available at www.eia.doe.gov/oiaf/servicerpt/stimulus/excel/aeostimtab_**18**.xls.
[12] 2002 Economic Census, Summary Statistics by 2002 NAICS, United States, Internet, available at http://www.census.gov/econ/census02/data/us/US000.HTM.

About the Beacon Hill Institute

The Beacon Hill Institute at Suffolk University in Boston focuses on federal, state and local economic policies as they affect citizens and businesses. The institute conducts research and educational programs to provide timely, concise and readable analyses that help voters, policymakers and opinion leaders understand today's leading public policy issues.

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"… a wise and frugal government, which shall restrain men from injuring one another, shall leave them otherwise free to regulate their own pursuits of industry and improvement, and shall not take from the mouth of labor the bread it has earned. This is the sum of good government, and this is necessary to close the circle of our felicities."

Thomas Jefferson, 1801