



Report on Appendix A-1 of the Virginia Energy Plan: Impacts of Proposed Regulations under Section 111(d) of the Clean Air Act

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Executive Summary

Virginia faces a set of complicated choices about how best to comply with new federal rules limiting emissions of greenhouse gases from power plants in the state. In order to solve this problem in a fair and efficient manner, the state will need careful and even-handed analysis of its obligations and opportunities. One early report on this issue came in a study carried out by the Center for Coal and Energy Research (CCER) at Virginia Tech for the Department of Mines Minerals and Energy.¹ Unfortunately, this report is deeply flawed and could lead the public policy debate down an unproductive path. The report contains a number of large errors including a double counting of costs that overstates compliance costs by half. The study establishes an incorrect baseline for calculating the costs of changes needed for compliance. The study fails to provide even-handed treatment of uncertainties, emphasizing only those uncertainties that serve to overstate compliance costs. Finally, the study focuses its analysis only on unrealistic, high-cost options for compliance, while giving only the most cursory and dismissive treatment of the options that most observers believe will form the core of cost-effective compliance options. In short, the report is almost certainly worse than no study at all because it misstates likely costs, analyzes irrelevant options, and gives short shrift to the cases that really matter.

The report:

- ◆ **Double counts compliance costs by about \$400 million annually because the authors added together two different estimates of compliance costs.** It's like going to two car repair shops for bids on fixing your brakes and then adding the different bids together to get the total cost of the repairs. (See page 23)
- ◆ **Overstates expected fossil fuel generation by at least 5,800 gigawatt hours per year by underestimating the likely use of renewable fuels and energy conservation.**
 - The report fails to acknowledge the energy conservation goals in other parts of the state energy plan and assumes that there will be no additional energy conservation efforts in the state after 2012. Even the very modest plans

¹ The economic analysis was performed by Chmura Economics and Analytics.

proposed by Dominion Virginia Power result in savings on the order of 3,000 gigawatt hours per year by 2030. Following the Virginia Energy Plan would have added even more savings. (Page 15)

- The report assumed no added renewable energy from wind or solar even though Virginia's electric utilities expect to comply with the state's 15 percent renewable energy goal either by generating the renewable energy in Virginia or buying it from other states. A conservative estimate puts in-state renew-able generation at around 2,800 gigawatt hours per year by 2030. This doesn't count the purchase of renewables from outside the state, which may be used under some compliance scenarios. (Page 10)
- ◆ **Made a calculation mistake that cut the estimated benefits of emission reductions by more than 40%.** CCER discounted the future benefits twice, a conceptual error that understates the benefits of emission reductions. It also neglected to adjust 2011 dollars into 2012 dollars to account for inflation. Both of these mistakes understate the estimated benefits of reducing carbon dioxide emissions. (Page 33)
- ◆ **Overstated estimates of the negative economic effects of the regulations by mischaracterizing Virginia coal markets.** The study implicitly assumes that most coal mined in Virginia is used for electricity generation and would have no market other than Virginia power plants. This is incorrect. As of 2011, only about a third of Virginia coal was used in electricity generation in Virginia. In 2013, over 45% of Virginia-mined coal was exported to foreign countries. (Page 27)
- ◆ **Used inappropriate and incomplete economic analysis in estimating total economic costs and associated job losses, inflating costs and job losses.** The economic analysis in the report implicitly assumes that people do not make sensible adjustments to changes in economic circumstances and assumes that there are no economic benefits elsewhere in the economy. Both of these assumptions are incorrect. (Page 29)
- ◆ **Assumes unrealistically low capacity factors for Virginia's new natural gas power plants in Warren and Brunswick counties.** A considerable portion of this power would offset higher emitting coal plants and would reduce the compliance gap relative to CCER's assumption. The difference is on the order of 6 million tons of CO₂ per year that would not add to compliance costs, but these emissions are included in compliance cost estimates in the study. (Page 18)
- ◆ **Fails to provide a full analysis of the option of building the third reactor at the North Anna Nuclear Power Station.** Building this plant, with its 11,000 gigawatt hours of non-fossil electricity annually, would bring Virginia into compliance with

the federal regulations on greenhouse gas emissions. Since the building of this plant figures prominently in Dominion Power's resource planning and in the assumptions of the regional electricity transmission organization, the building of the reactor should have been included in at least one baseline scenario. (Page 15)

- ◆ **Overestimated the rate of growth in electricity demand.** CCER assumes a 1.51% annual growth rate in electricity demand. Recent experience has seen much slower growth in demand, and this should have factored into the analysis. At a minimum, CCER should have noted recent lower growth rates and carried out a sensitivity analysis of their high growth rate assumption. (Page 11)
- ◆ **Does not analyze any cases of cooperation between states, even though such cooperation is a known way to lower compliance costs.** In its brief discussion of this issue, CCER provided an incomplete and unbalanced treatment of options for multi-state cooperation. This analysis does not reflect the large scientific literature on low-cost emission compliance options. (Page 36)
- ◆ **Misinterpreted, on at least two occasions, analysis provided by the EPA in the EPA's regulatory impact analysis of its proposed rule.** These mistakes demonstrate a clear lack of expertise in both economics generally and in the analysis of climate policies in particular. (Pages 23 and 33)
- ◆ **Incorrectly characterized the results of a U.S. GAO report on EPA's use of "social cost of carbon" estimates.** The CCER report represents the GAO as being critical of EPA's methodology, when actually the GAO found that EPA followed the appropriate guidelines for using the "social cost of carbon" in its analysis. (Page 32)

Once corrected for double counting, the analysis shows positive net benefits of reducing CO₂ emissions. This is true in spite of the overestimation of compliance costs.

A disturbing fact about this list of errors and inappropriate assumptions is that they all tend to overstate the likely cost of emission reductions and, in turn, the cost of compliance with the new rules limiting emissions of greenhouse gases. Decision makers in the Commonwealth will need to look elsewhere than this report for guidance on best strategies for complying with the new rules.

To avoid such mistakes in the future, agencies with responsibilities related to compliance with these regulations should subject their analysis to peer review by outside experts in the field and should consider whether there would be value in forming a technical advisory committee to help ensure that any analysis done is both unbiased and methodologically sound.