Inside Energy

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RE: Comments on Virginia SCC Staff Analysis of Customer Bill Impacts of RGGI
DATE : 3/7/2019 **David T. Stevenson, Director**

A Virginia State Corporation Commission (SCC) staff report dramatically under-estimates the potential cost of linking the Regional Greenhouse Gas Initiative (RGGI) program to Dominion Energy Virginia. Several assumptions are changed in this analysis to reflect more likely future occurrences including using; a higher emission allowance cost estimate, extending an allowance cost estimate for the 2031 to 2040 time period, estimating cost of inefficiencies of cycling coal-fired power plants, the cost of the possible premature closing of the Virginia Energy Center power plant, and additional costs to import more power from out-of-state. The impact of including these items could raise the total cost over the 25 year study period from $3.3 billion to $12.9 billion, and could raise the estimated annual average residential electric bill from $83 a year to $324. Virginia may lose half a billion dollars a year in wholesale electricity sales by importing more out-of-sate power costing jobs, and tax revenue. This report also points out even the $83 a year exceeds the willingness to pay to reduce carbon dioxide emissions of almost two-thirds of survey respondents. The staff report also misses $604 million a year in potential liability from a Dormant Commerce Clause lawsuit based on Virginia policy creating a negative consequence for other states. The liability for each year adds $125 a year to residential electric rates.

1) **RGGI allowance permits likely to track the increasing CCR trigger prices not the ECR**

The SCC assumes RGGI allowance prices will track a new minimum price target set by RGGI as an emissions reserve trigger price (ECR). If allowance prices fall below the ECR, allowances are withdrawn from an auction to prop up the allowance price. RGGI also established a cost containment reserve trigger price (CCR) announced in 2013. If allowance prices exceed the CCR more allowances are added to an auction to keep prices from going higher. The SCC comments allowances prices have often been below the cap. However, RGGI has been playing catch up since its inaugural auction in 2008. The natural gas revolution drove natural gas prices lower than the equivalent price of coal at the same time new US EPA regulations forced the shut-down of older, smaller coal-fired plants. Consequently, generation shifted to lower emitting natural gas faster than RGGI could reduce emission targets leaving a glut of allowances for most of the last eleven years. Those trends have mostly run their course. In addition, speculators are likely to play a role in keeping allowance prices high. Speculator participation has varied from zero to 43 percent, and allowance prices rise with speculator participation with a 0.53 correlation. It is much more likely auction prices will follow close to the price signal of the CCR. Over the 2020 to 2030 period the average ECR price, used by the SCC, will be $8.07/ton of CO2. The CCR will average $17.30/ton, 2.14 times as much, so using the CCR price more than doubles the SCC estimated price impact from $83 a year to $178. A $0.44/MWh PJM premium estimate may more likely be $0.94/MWh.

2) RGGI allowance prices are likely to continue rising in the 2031 to 2040 period

The SCC has recommended a 25 year analysis period extending to 2040, but assumes zero allowance cost after 2030 as RGGI has not established ECR or CCR prices beyond 2030. The RGGI coalition has made it clear the ultimate goal is zero emissions, and has already extended RGGI twice along with raising emission allowance price targets. A safer assumption is to expect allowance prices to continue to rise through 2040 at a rate similar to the increase from 2020 to 2030, or 7% a year. The SCC is using a 6.31% discount factor, so it would be reasonable to assume the inflation adjusted price might average about $24/ton between 2031 and 2040. That is 39 percent higher than the CCR average used to calculate the $178 a year residential impact in item 1 which would raise the annual cost to $247 a year. It also adds another $1.32/MWh to the PJM premium estimate for a total cost of $2.26/MWh.

3) There are additional RGGI costs as power plant efficiency drops

The immediate impact of RGGI allowance costs on coal generating power plants will be dramatically lowered capacity factors. In Maryland and Delaware coal-fired power plant operating hours drop as RGGI allowance prices rise (see Chart 1 below). These power plants were not designed to ramp up and down easily so efficiency drops (see Chart 2). An Environmental Protection Agency spreadsheet calculates the cost to run Selective Catalytic Reduction (SCR) pollution control equipment under various operating conditions (see attached spreadsheet titled "SCR Cost Manual Spreadsheet"). Based on the spreadsheet model the SCR operations cost may rise by $2.45/megawatt-hour, and increased coal usage may add another $0.54, for a grand total of $3/megawatt-hour in added operating cost. An analysis (see attached spreadsheet titled "Virginia Electric Generation and Imports with RGGI Limits") of likely reduced generation from coal-fired power plants in Virginia as RGGI emission caps kick in shows 16.2 million MWh may be produced between 2020 and 2025 under these less efficient conditions. That could add an extra $48.6 million. It also adds another $0.05/MWh to the PJM premium estimate for a total cost of $2.31/MWh.

Chart1

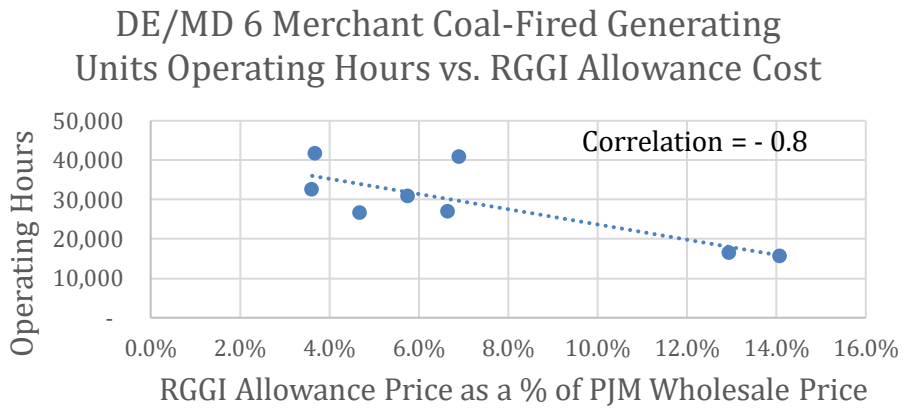
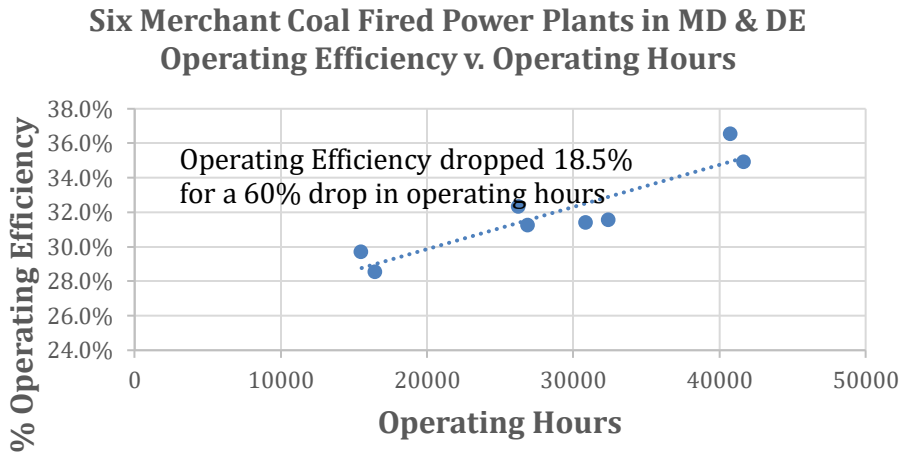


Chart 2



4) Additional power plants may close, and no new plants should be built

The SCC report already assumes ratepayers will have to pay $781 million to prematurely close the Chesterfield and Clover coal-fired plants by 2025. To meet the rapidly falling emission caps Dominion Electric Virginia will also have to close the $1.6 billion Virginia Energy Center just completed in 2012. The plant burns coal, waste coal, and biomass. In addition, the caps will limit the amount of power that can be generated from natural gas-fired power plants starting in 2027. In 2018 natural gas plants generated 50.4 million MWh of power. This will have to fall to 43.6 million MWh by 2030, and 24.9 by 2040 to meet the emission caps. The SCC report assumes new natural gas power plants will be built in Virginia. With a 40 year life, and production of existing plants limited by emission caps, Dominion should not ask for, and the SCC should not approve new power plants in Virginia.

5) More power will need to be imported

With restricted power generation electric generators will need to purchase more power from out-of-state. PJM pricing models add charges for line losses for the increased transmission distance, and congestion charges for jamming up interstate transmission lines. Lower operating time tends to raise capacity prices in importing states. The Maryland Public Service Commission staff hired a consultant to estimate the value of these charges for their recent offshore wind docket, and found it totaled $1.97/MWh for extra imported power (file:///C:/Users/dtste/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/LevitanAssociates_UpdatedTables_27Mar17.pdf). The increase in imports will rise from 1.5 million MWh in 2020 to 30.8 million in 2040 when Virginia will be importing almost half its power, as RGGI state Delaware did in 2018. The cumulative extra cost of importing 290 million MWh of power is estimated to be $572 million between 2020 and 2040. At an average wholesale

electric price of $37/MWh, Virginia may lose half a billion dollars in electric generation a year costing jobs and tax revenue.

6) Staff report misses the potential cost of legal liability

The staff report misses the potential cost of legal liability from raising electric rates in other states by linking the Regional Greenhouse Gas Initiative (RGGI) program to Dominion Energy Virginia. The Staff report states:

"SCC Staff estimates that Virginia linking to RGGI will cause PJM power prices to increase by an average of $0.44 per megawatt hour over the 2020 to 2030 time period. Hourly PJM energy prices are determined by the marginal unit that clears the market each hour. The imposition of additional costs on Virginia fossil fuel units for the required offsetting CO_2 emissions allowances under RGGI will generally lead to higher cost marginal units setting the hourly PJM energy price, thus putting upward pressure on PJM energy prices."

Establishing a state policy that raises costs in other states is a violation of the "Dormant Commerce Clause" of the US Constitution that prohibits a state from creating a negative consequence for another state related to interstate commerce. Only Congress can pass such a law applying to all states. We have shown the potential for RGGI participation to raise the marginal costs at Virginia fossil fuel plants may be as high as $2/31/megawatt-hour, not $0.44. By raising PJM average wholesale energy rates by $2.31/MWh covering 608 million megawatt-hour year in non-RGGI PJM states, RGGI may cost non-RGGI states $1.4 billion a year. If non-RGGI states sued and won, Virginia's share of the potential lability is $604 million a year (43 percent of the Virginia/New Jersey/Maryland/Delaware RGGI state total generation). Spread over Virginia's 117 million megawatt-hour total electric demand the liability would be $5.20/megawatt-hour, and could raise residential electric rates $125 a year.

Conclusion

The SCC report estimates linking Dominion Energy Virginia to RGGI will add $3.3 billion in cost, and impact residential electric rate by rising $83 a year. This exceeds the willingness of electric customers to pay the added cost. A recent study by the University of Michigan ("National Surveys on Energy & Environment", willingness to pay Q31, http://closup.umich.edu/national-surveys-on-energy-and-environment/nsee-data-tables/nsee-2017-spring/#Q31) concluded 34 percent of the U. S. population is not willing to pay anything extra for CO_2 reduction, with another 28 percent only willing to pay $50 a year. Almost two thirds of the public is unwilling to pay for this program at the SCC estimated cost. Adding the costs described in these comments could raise the estimated cost of linking to RGGI to $12.9 billion, and could raise residential electric rates to $324 a year. Table 1 summarizes the changes. The staff report also misses $604 million a year in potential liability from a Dormant Commerce Clause lawsuit based on Virginia policy creating a negative consequence for other states. The liability for each year adds $125 a year to residential electric rates.

Table 1: Cost impacts from the SCC Report to this revised analysis - $ billion

	SCC	Revised
Energy Cost	0.4	2.3
Net allowance cost 2020-2030	0.8	1.7
Net allowance cost 2013-2040	0	5.2
Premature plant closings	0.8	2.4
Other Costs	1.3	1.3
Total	3.3	12.9