Review of Nicholas Institute Modeling of Mixes of Rate-Based and Mass-Based States for Clean Power Plan Compliance

Clean Air Council – Following are thoughts on the August 16, 2016 Nicholas Institute (Duke University) presentation on their Clean Power Plan (CPP) modeling, from which the following information is taken. The presentation is called:

Webinar: Ongoing Evolution of the Electricity Industry: Effects of Market Conditions and the Clean Power Plan on States Nicholas Institute for Environmental Policy Solutions, Duke University August 16, 2016

The page numbers refer to pages in the presentation where maps show the assumed distribution of rate-based and mass-based states.

This table summarizes what I believe to be the most useful information in this energy modeling study. It is the best study currently available on the effect of some states choosing a rate-based program for CPP compliance and other states choosing a mass-based program. Studies assuming all states will go mass-based or all states will go rate-based provide boundary information, but are unrealistic.

Note that Emission Rate Credit (ERC) and allowance prices are a good indication of potential increases in the price of electricity for ratepayers from implementation of the CPP. That is because power plants will include the value of the ERCs or allowances in their bids for providing electricity to the wholesale market. Because of this, the CPP could result in increases in the price of electricity which are much higher than the costs of compliance for the power plants.

Nicholas Institute Predicted Price of ERCs and Allowances for Mixes of Rate-Based and Mass-Based States for 28 States in Eastern USA, Not Including RGGI States

Page	Number of rate states (out of 28)	ERC price (\$/MWh)	Number of mass- based states (out of 28)	Allowance price (\$/ton)	Price ratio	Notes on rate-based states
23	4	2.60	24	4.50	0.56	nuclear states (including NJ)
24	9	4.40	19	4.30	1.07	nuclear states + central plains states
26	13	6.90	15	5.70	1.21	includes all mid-Atlantic states
25	14	7.50	14	4.40	1.70	includes all southeastern states
27	28	14.90	0	none	N/A	Unlikely scenario

NEW JERSEY ERC NEED IF RATE-BASED PROGRAM AND ALLOWANCE NEED IF MASS-BASED PROGRAM (based on NJDEP staff estimates of need)

NJ ERC need estimate = about 12 million ERCs per year in 2030

NJ allowance need estimate = about 24 million allowances per year in 2030

Therefore, the NJ ERC price would have to be 2 times the NJ allowance price for the total cost of ERCs (if NJ were rate-based) to be greater than the total cost of allowances (if NJ were mass-based).

CONCLUSIONS

- 1. Since the ratio of ERC price to allowance price is lower than 2 for all mixes evaluated, rate-based would be lower total cost for NJ for all these mixes.
- 2. Lowest ERC prices occur when only the states that produce many ERCs are rate-based. The more states that are rate-based, the higher the ERC demand, and the higher the price of ERCs.
- 3. If all states are rate-based, the ERC price is highest. This will not happen, because mass-based is obvious choice for most states.
- 4. Some of the mixes include states as rate-based when they would most likely be mass-based (West Virginia, Kentucky, Ohio, and Mississippi for example). If the models were rerun without these states being rate-based, the price of ERCs would be even lower.

Another interesting analysis is on page 22, which predicts the net exports (or imports) of ERCs from each state if all the USA is rate-based, except RGGI and California, and if there is nationwide trading of ERCs. It indicates that NJ could be a fairly large exporter of ERCs, 16.7 million ERCs per year in 2030. That number of excess NJ ERCs is near the upper end of the range of excess ERCs that NJDEP staff have predicted could result from continued implementation of New Jersey's Energy Master Plan. (It could also be much lower, even an ERC deficit, depending on the final EPA CPP rules.) In comparison, NJDEP staff estimated our ERC need at about 12 million ERCs. So 16.7 excess ERCs is a big number for NJ.

While nationwide rate-based programs are unlikely, the Nicholas Institute analysis on page 23 can be used to give an indication of what states might choose rate-based programs, based on predictions of significant amounts of excess ERCs. That would include NJ, SC, and the central plains states. Those states that would be significant ERC importers, such as WV, would likely choose a mass-based program to minimize ratepayer costs. Considering the export analysis and other information in the Nicholas report, the mixes of rate-based and mass-based states can be refined to better reflect probable choices. Also, since the actual choice of each state would affect ERC and allowance prices in other states, a model of rate-based and mass-based states that reflect those <u>actual</u> choices would eventually be needed to better estimate exports of allowances or ERCs, and prices of allowances or ERCs. Overall, the Nicholas analysis of mixes of rate-based and mass-based scenarios is very useful information on how state generation portfolios and CPP choices matter.

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Source: New Jersey Department of Environmental Protection, August 18, 2016