

September 9, 2005

Mr. Karl S. Michael
Senior Project Manager
Energy Analysis
NYSERDA
17 Columbia Circle
Albany, NY 12203-6399

SUBJECT: Electric Power Research Institute (EPRI) Sponsored Modeling Results

Dear Karl,

As we discussed earlier this year, EPRI has contracted with ICF Consulting (ICF) to run a limited set of modeling scenarios in conjunction with and using modeling assumptions defined through the Regional Greenhouse Gas Initiative (RGGI) process. As you might recall, EPRI sponsored this project to help better understand the impact on CO₂ when nuclear energy is not available in the region since funding was not available for these reduced nuclear capacity runs through RGGI. This letter transmits initial results for all scenarios currently under contract.

We request that these results be posted to the RGGI public website and shared with RGGI Stakeholders at the next meeting on September 21st. We have provided a copy of this letter and attachments to our utility company advisors, the Nuclear Energy Institute and the Edison Electric Institute for their information. We intend this to be completely public information; it can be shared freely.

The following comments provide additional details and clarification for the attached set of slides and three spreadsheet files:

The modeling scenarios all assume 31% of the nuclear capacity in the region does not receive license renewal and are defined as follows:

- Using RGGI Reference Case assumptions (labeled as EPRI Ref)
- Using RGGI High Emissions Reference Case assumptions (labeled as EPRI High Ref)
- Using RGGI Reference Case and 25% Below 1990-Level Cap assumptions (labeled EPRI 25% Cap)

The RGGI Reference Case and RGGI High Emission Reference Case assumptions used were those available this summer when the modeling was begun. EPRI realizes that RGGI

Mr. Karl Michael
NYSERDA
September 9, 2005
Page 2

is in the process of releasing new reference cases, and it is our understanding that the assumptions we used and those to be released shortly are not different enough to significantly impact the results. The value of these runs can be found by comparing the results achieved by RGGI and the results achieved by EPRI using the same reference assumptions but different nuclear capacity levels.

With one exception, EPRI used the same publicly available assumptions as the RGGI Staff Working Group. Since the Renewable Demand Curve was not available in the public domain, ICF, working with EPRI, back calculated the renewable assumptions. ICF has advised us that the results are very similar.

The key results for these scenarios are summarized below:

EPRI Reduced Nuclear Reference Case results for 2024:

- Natural gas builds increase from 21 GW in the RGGI region when all nuclear power plants receive license renewal to approximately 26 GW in the Reduced Nuclear Scenario where nuclear capacity is 31% less than today's level.
- Regional CO₂ emissions rise from 144 million tons to 159 million tons in the Reduced Nuclear Scenario.

EPRI Reduced Nuclear High Emissions Reference Case results for 2024:

- Coal builds in the RGGI region increase from 11 GW to 15 GW in the High Emissions Reduced Nuclear Scenario, while natural gas additions drop from 13 GW to 8 GW.
- Imported electricity rises from almost 50 TWh to 70 TWh.
- CO₂ emissions rise from 169 million tons to 195 million tons in the High Emissions Reduced Nuclear Scenario.

Under the Reference Case and 25% Below 1990-Level CO₂ Cap Scenario:

- Natural gas builds increase from 16 GW in the RGGI region in 2024 when all nuclear power plants receive license renewal to approximately 21 GW in the Reduced Nuclear Scenario where nuclear capacity is 31% less than today's level.
- CO₂ allowance prices almost double over the whole analysis period, rising from \$7/ton to \$13/ton in 2024.
- Imports are significantly increased, more than doubling in 2024 to above 100 TWh.

Mr. Karl Michael
NYSERDA
September 9, 2005
Page 3

As you are aware, EPRI has a desire to supply unbiased information and analyses as CO₂ cap and trade programs are considered in the Northeast. We hope the results provided here are informative and useful. In the future we hope to continue to provide additional information and analyses.

Let me know if you have any questions or comments.

Sincerely,

Layla Sandell
Manager
Advanced Nuclear Plants' Systems

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Brellenthin, J., TVA
Clark, C., EPRI
Cunningham, D., PSE&G
Dorsey, B., Entergy
Dupuis, L., Dominion
Holdsworth, E., EEI
Keuter, D., Entergy
Kozak, L. A., Southern
Machiels, A., EPRI
Melancon, S., Entergy
Miller, M., EPRI
Quillian, M., NEI
Quinn, J., Constellation
Smallridge, L., FP&L
Steen, D., FirstEnergy
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