Below are my responses to the IEP presentation on Friday, Nov. 1.

Insufficient GHG Emissions Reductions

The 2018 IPCC report called for a 45% cut in global GHGs (over the 2010 level) by 2030 in order to prevent global warming from exceeding 1.5^{o}C beyond which the effects of climate change are likely to be much more dramatic and irreversible. The EMP/IEP must support the IPCC goal and set a 2030 target to cut GHGs by 45% (or an amount based on New Jersey's emissions that supports this global objective). New Jersey's 2010 GHG emissions were 112.5MMT. A 45% reduction from this level means that NJ's target GHG emissions for 2030 should be 62MMT. The IEP preferred least cost scenario objective appears to be about 75MMT (only a 33% reduction from 2010). **If we don't meet the IPCC's target it will not matter what is done in 2050.** RMI must be asked to run scenarios with this objective in order to determine what is required to achieve it.

The IEP plan does not consider the possibility that any new gas infrastructure projects will be completed and put in service, even those that have been completed since the current administration took office (IEP GHG emissions clearly do not include the 5MMT of annual GHG emissions from Sewaren 7) or are under construction. If, for example, the PennEast pipeline is constructed, its annual 15MMT of CO2e emissions will completely invalidate the IEP plan. At the very least RMI should be instructed to run a few scenarios modeling the effects from these projects and determine the impact on the current plan. What is the BPU/DEP strategy for handling such an unexpected increase in GHGs?

Cost Assumptions

Little data was provided on specific costs or methodologies and assumptions leading to the cost data. Since the model is significantly constrained by having a least cost objective, this data must be provided in detail for analysis by stakeholders. This should include assumed costs for all sources of energy, storage and distribution.

It is strongly suggested that a more reliable means of assessing ratepayer willingness-to-pay be developed, rather than the type of investigation the DEP is conducting to determine ratepayer cost sensitivity. One method would be to present residents with alternative scenarios regarding the environment (including increased health issues and health care costs, storm and flooding damage, increased energy usage for cooling, sea level rise, etc.) in focus group settings and ask about willingness to pay to achieve a satisfactory environment. Apparently, there was no such concern or research about ratepayer reactions to the $300M annual increase due to the nuclear bailout that is not considered beneficial to ratepayers. Why, therefore, is there such concern now over a plan that is intended to **save residents from climate change disaster**?

The RMI scenarios did not include the effects of climate change on costs. For example, energy load increases from the use air conditioning more months of the year due to increased global temperatures. These must be included.

The increased nuclear bailout costs if nuclear plant lives are extended must be included.

On page 44 of the IEP presentation "Scenario Net Cost over Time," Variation 5 "no new gas and nuclear retires" costs less than "Least Cost," through 2044. Why not choose the former for now while pushing hard to reduce the spike beginning in 2045, and as we

get closer to that time period, revisit the available options? In other words, defer the nuclear extensions as there is no need to make that decision now. It can certainly wait a decade or two, especially as we're already giving them a $300M handout.

The Governor and the EMP have cited economic benefits to residents from this plan, including new jobs in renewable energy technologies, new construction and increased investment in renewable technology that will help New Jersey's economic growth. In addition there is clear evidence today that the cost of energy from renewables is at par, and in some cases, below the cost of energy from fossil fuels and are forecasted to continually decrease. Therefore, there must be savings over current costs from this transition and it does not appear this is being taken into account in ratepayer research. All of these costs should be included in a GDP view of the tradeoffs in the IEP plan in order to assess the total economic impact of this transition on New Jersey's economy.

Overall, we must all reject the limitations imposed by the least cost assumptions. We are facing an existential threat to our world. This threat will only be addressed by a strong leadership approach that sells residents on the need for these changes, not the approach of an accountant watching pennies.

Data Credibility

The misleading results from using the 100-year impact on CO2e from methane in this analysis have been demonstrated several times. This plan addresses a 30-year period and using the 100-year value for methane's global warming power is simply bad science and bad modeling practice. A new report, published November 5, 2019 by 11,258 scientists in 153 countries from a broad range of disciplines warns that the planet "clearly and unequivocally faces a climate emergency." It provides six broad policy goals that must be met to address it. Among those policies is "**quickly cutting emissions of short-lived climate pollutants, such as soot and methane, which could slow short-term warming.**"

RMI must be asked to run their models with both the 20-year and 100-year values for methane's global warming power in order to properly assess the impact of these assumptions. In addition, we need to understand the methane leakage factor (if any) being used in this model as well as any assumptions about black carbon.

It is noted with interest that the IEP model shows decreases in natural gas usage starting in 2020, before the expected date of the GWRA targets and regulatory procedures for reducing GHGs. It also shows reductions in gasoline usage starting in 2020. At the same time, as stated above, there are about a dozen new natural gas infrastructure projects either under construction or in various states of planning and permitting. This raises credibility issues. Please provide the assumptions behind these expected decreases in natural gas and gasoline usage.

The GHG numbers in the IEP presentation (labeled 'current,' but without a date) differ from those in the EMP for 2016. Electricity in 2016 was 20.7MMT and is now 17MMT. Vehicles in 2016 were 47MMT and now are 43MMT. Please explain these differences, as they do not seem reasonable.

Overall, the credibility of the DEP's GHG numbers is questionable based on the limited information provided as to how they were produced. DEP's latest GHG numbers on its website are from 2015. It is important to understand how the DEP calculates GHG

numbers. How much is based on actual air sampling and how much is estimated and the estimating assumptions. While this may have not been that crucial in the past, going forward this has new importance as **the EMP's entire success or failure is based on GHG reductions** and credibility is extremely important.

Forcing Functions

Forcing functions are those forces that will create change in our energy mix to achieve the IEP forecast. These include economic, statutory and regulatory forces along with enforcement of statutes and regulations. There is very little in the IEP plan about these forces. Stakeholders need to understand what these must be in order to achieve the forecasted results. Stakeholders need to be able to compare them to actual efforts in the legislature and regulatory agencies to assess their reasonableness. This is related to the surprising forecast of natural gas reduction in 2020 described above without any explanation as to its cause.

Clean Energy

The IEP forecasts the need for continued use of hydrocarbons such as biogas, to meet the insufficient goal of an 80% reduction in total GHGs by 2050. As previously stated, a number of environmental organizations disagree with the redefinition of clean energy to be carbon neutral and find the arguments for the need to continue to burn hydrocarbons insufficient. RMI must be asked to run a scenario showing the impacts of completely carbon free energy production by 2050 so we can assess the viability of this target.

There is no mention in the IEP of Class II renewables such as hydroelectric. Has this been assessed? If so, what are the results and if not, why not?

The volume of solar energy forecasted in the IEP report cannot be produced without lifting the solar cap. What are the IEP assumptions around this issue? What are assumptions on the solar generation of electricity in terms of solar from residential roof-tops vs. utility farms or other construction solutions?

Timeframe and Next Steps

Changes of this magnitude in the EMP/IEP and analyses such as this modeling that inform them requires a much more robust and interactive public process than just a webinar and a comment period that ends 11/15. The BPU/DEP should extend the comment period, release all the assumptions and details, with enough time before the close of comments to digest them, and conduct public meetings where there can be meaningful back and forth with the public and any other stakeholders affected by the modeling.

In particular, since a number of New Jersey environmental organizations were not invited to attend the June workshop to provide inputs on scenarios, all of the requests above on new scenarios should be run before the end of the comment period. In addition, all must have the opportunity to meet with RMI to discuss those scenarios as well as all other assumptions and data used in the development of their plan.

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