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Via Electronic Mail

Michael Winka
Senior Policy Advisor
New Jersey

RE: 2019 Energy Master Plan Comment Summary– Building a Modern Grid

Dear Mr. Winka:

We appreciate the opportunity to provide the following summary of comments to the New Jersey Energy Master Plan (EMP) that we intend to present at the workshop on building a modern grid.

Ingersoll Rand (NYSE:IR) is a global company that advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Thermo King® and Trane®—work together to increase industrial productivity and efficiency, enhance the quality and comfort of air in homes and buildings, and commercial transport; and to protect food and perishables. We manufacture CALMAC Ice Bank® thermal energy storage tanks in Fair Lawn, NJ that work with our Trane® chillers and integrated controls to create distributed energy storage systems. To date, more than 120 MWh of thermal energy storage (TES) has been installed throughout New York City with more than 1 GW installed globally.

TES provides C&I customers with the ability to materially time shift their energy usage during hot summer months. It relies on chillers that make ice typically at night (charging) which is then

used to provide air conditioning service during the day (discharging).[1] This process enables building owners to use off-peak energy during peak times. TES is also highly durable, efficient and safe, with no flammable or hazardous materials. CALMAC TES tanks have a useful life as long as 30 years with little maintenance cost and achieves round trip efficiencies approaching 97%.[2] Moreover, it can provide cooling service for at least eight hours at a time, and almost all of its components can be recycled at the end of its useful life. Overall, TES lasts 2 to 4 times longer than batteries at a fraction of the cost.[3]

The deployment of TES can also help New Jersey achieve its clean energy goals. TES is well suited to "storing" the wind energy it uses at night for daytime use.[4] This enables emission-free energy to be utilized during the day and reduces the need for peaking fossil fuel plants.

We are encouraged that the EMP will address current barriers to new and enhanced infrastructure, facilitate the utilization of new and developing technologies, and ultimately identify a path to provide affordable distribution of energy as the state transitions to 100 percent clean energy by 2050.[5] Our summarized comments are presented below.

Current Barriers to New and Enhanced Infrastructure

One of the current barriers to accelerating a new and enhanced infrastructure is a general lack of incentives for energy storage. Currently, the spot market electricity prices tend to be 40% lower at night.[6] Although this is driving some adoption of TES, our experience in other markets indicates that more incentives are necessary to accelerate the market. Specifically, stable

[1] http://www.trane.com/commercial/north-america/us/en/products-systems/equipment/chillers/ancillary-chiller-equip/ice-making.html.
[2] Batteries by comparison have round trip efficiencies closer to 85% and useful lives of 10 years, according to the 2017 Lazard Levelized Cost of Storage. The report also found that batteries can degrade and must be replaced to maintain capacity. https://www.lazard.com/media/450338/lazard-levelized-cost-of-storage-version-30.pdf
[3] CALMAC analysis as published in Distributed Energy Magazine, January 2018. http://www.trane.com/commercial/north-america/us/en/about-us/newsroom/blogs/thermal-storage-and-batteries-working-together.html
[4] https://tc0609.ashraetcs.org/documents/research/TC0609%20ASHRAE%20RP-1607%20Research%20Summary%2020180125.pdf
[5] https://nj.gov/emp/energy/
[6] Analysis of PSE&G Day-Ahead LMPs

incentive programs along with demand charges and/or time of use rates drive demand while establishing value over the long term. This helps customers like building owners plan for the types of investments that will benefit the grid.

Utilizing New and Developing Technologies

New and developing technologies can help New Jersey meet its clean energy goals. Specifically, TES can help integrate renewables like wind by providing time shifted, emissions-free nighttime energy for daytime use during hot summer months. Additionally, TES can be used as an automated demand response asset by both C&I customers as well as utilities which allows for more system flexibility.

Affordable Distribution of Energy to All Customers

Accelerating the adoption of energy storage like TES into the New Jersey market will help make energy more affordable to C&I customers because it takes advantage of the lower nighttime costs of energy.

We support New Jersey in its path to a cleaner energy future. Please feel free to contact me directly with additional questions.

Respectfully Submitted,

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