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September 20, 2018

VIA ELECTRONIC DELIVERY & OVERNIGHT MAIL

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Testimony of
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New Jersey Draft Energy Master Plan
Building a Modern Grid
September 24, 2018

Good morning. My name is Joseph Accardo, Deputy General Counsel and Chief Regulatory Officer for PSEG. Thank you for the opportunity to provide thoughts and comments with respect to Governor Murphy's proposed 2019 Energy Master Plan and today's "Building a Modern Grid" stakeholder meeting. This is the fourth of five stakeholder meetings designed to gather input from members of the general public, community leaders, environmental groups, and business and industry leaders on the proposed EMP. I am pleased to provide PSEG's perspective on the importance of continuing to build, strengthen and modernize the electric infrastructure.

PSE&G owns and operates 1,700 circuit miles of electric transmission and 22,000 circuit miles of electric distribution in service of 2.2 million customers here in New Jersey. In addition, PSE&G owns and operates 58 miles of gas transmission and 17,800 miles of gas distribution

mains to service 1.8 million customers in New Jersey. Like our country's interstate highway system, electric and gas transmission and distribution infrastructure is essential to New Jersey's economic well-being and quality of life. It has helped power the industrial northeast for more than a century. Unfortunately, a significant portion of New Jersey's transmission and distribution system dates back to the early 1900's and needs to be replaced and upgraded to handle the increasing demand for clean and reliable power. In recent years PSE&G has worked to replace, upgrade, modernize and sometimes move parts of the grid to ensure our system can withstand extreme weather and other threats. For even as our customers are using less gas and electricity, their reliance on clean and reliable energy has never been greater.

Our investments must be targeted and prudent. We must push back against the myth that investments in a modern electric grid are not needed in periods when the demand for power is flat. Recent events in North and South Carolina are all-too-painful reminders of Superstorm Sandy, which devastated our region and cost customers 775 million hours of lost electricity. Since Superstorm Sandy, PSE&G has made significant infrastructure improvements that have reduced unplanned transmission outages by over 60 percent. Watching our fellow citizens struggle with the effects of Hurricane Florence has yielded an appreciation for NJ's robust grid and the need to continuously strengthen and modernize it. The high-voltage grid must also be storm-hardened and modernized for an environment that can be hostile to our electrified society. The customer benefits are clear and unassailable.

As we move further into the 21st Century, the electric grid must be upgraded to adapt to more distributed generation and energy storage, a shift in the electric generation mix, a move away from central generation, and a world that places a high premium on system resilience.

Edge-of-grid technologies like energy storage and electric vehicle infrastructure are important complementary pieces to that investment. The need for continued strong investment in building a modern grid requires an investment in grid facilities as a first option (rather than a last resort) when it comes to meeting local and regional reliability needs. In virtually all instances, a robust modern grid will retain its importance and vitality as a complement to, and facilitator of, technology and markets.

At PSE&G, our goal is to enable more renewable energy resources to interconnect while maintaining the reliability of the grid for all customers. As such, we continue to develop innovative tools to help the State achieve the 50% renewable goal by 2030. From the Solar Loan Program to the Solar4All Program, from creating a customer-friendly process enabling residential customers to install rooftop solar to providing very generous solar limits for distribution circuits and substations, PSE&G has been a leader in the effort to accommodate more residential, commercial and large solar farms.

With that said, it must also be recognized that some areas in southern and central NJ have experienced tremendous growth in the adoption of renewable energy, particularly solar, that has tested the limits on individual electric circuits. It is undeniable that part of building a modern grid will be planning for and developing new tools to equip the grid to accommodate large amount of renewables.

PSE&G's recent Energy Strong II filing represents the next step in PSE&G's efforts to further strengthen the utility's gas and electric systems to withstand storms, improve reliability, significantly enhance resiliency and meet the Governor's goal of 50% renewable energy by 2030. Through hardening stations and circuits and increasing system automation, the Energy

Strong II program will improve reliability and enhance resiliency. In addition, by building a secure distributed communication network and new operational tools PSE&G is working to modernize the system to not only increase resiliency but also implementing the foundational tools to safely and reliably integrate new, clean and renewable generation sources.

Building a modern grid gives us the optionality to adapt to whatever the future holds, and a modern and resilient transmission and distribution system will be among the most valuable energy assets we have. Distributed generation resources, energy storage, and other new technologies will not supplant the need for a modernized electric grid. Rather, these resources and technologies will depend more than ever on the grid for their economic justification and deployment. Growing demand for electric vehicles, the declining cost of renewable generation, the imperative to reduce carbon emissions, improvements in battery technology, and other developments coupled with the requirements of intermittent distributed generation resources near load centers make a modernized electric grid an invaluable, essential asset for an energy-dependent society.

A modern grid will depend on continued investment both in distribution assets and the transmission highway that moves generation to distribution lines. A core element of the next generation grid is therefore a reliable and resilient transmission network. Transmission is and will continue to be the backbone of our electric system, and the ability of the modern grid to respond to the dynamic needs of the customer is predicated on the efficient and reliable flow of power through the high voltage network.

PSE&G has been actively involved in upgrading and reinforcing its transmission system over the last several years. We have made, and continue to make, investments that maintain

reliability, make our system more resilient to protect against extreme weather and man-made threats, replace aging infrastructure, and modernize our facilities to make them smarter and more adaptable for the new technologies our customers are seeking.

Our investments have also included large and challenging Extra High Voltage (EHV) transmission projects covering hundreds of miles in some of the most densely populated areas in the nation. Collectively, these projects have achieved multiple objectives – not only replacing aging infrastructure, but also addressing reliability concerns, improving resiliency, reducing congestion and increasing access to lower cost generation resources.

On the natural gas side, our Gas System Modernization Program (GSMP) improvements are reducing methane emissions caused by leaks in older infrastructure, installing additional safety devices like excess flow valves, and supporting increased use of natural gas for traditional applications, as well as emerging technologies such as residential fuel cells, combined heat and power equipment, and compressed natural gas vehicles. Cast iron and unprotected steel gas pipes represent less than 25 percent of PSE&G's infrastructure, but they account for more than 65 percent of distribution system's methane gas leaks each year. Our objectives remain to provide our customers and the communities we serve with the safe and reliable gas for their present and future needs while reducing greenhouse gas emissions, and providing a positive impact on employment and the New Jersey economy.

Energy storage also offers some extremely promising benefits for modernizing the electric grid: energy storage enables higher levels and better integration of renewable energy onto the electric grid, provides resiliency for critical infrastructure and enables electric lines to handle greater capacity during times of peak electric use. As you know, the Governor has set a

target of 600 MW of energy storage in the state by 2021, and 2,000 megawatts of energy storage by 2030. PSE&G has already taken up the Governor's challenge and is investigating ways to more effectively integrate energy storage into its infrastructure to provide resiliency and maintain reliability as the amount of grid connected solar increases. PSE&G's Solar 4 All® program currently has a 3 megawatt (dc) pilot program that integrates solar with other battery technologies to provide grid reliability and resiliency for critical facilities during prolonged power outages. We have four solar storage projects in operation in our service territory as part of this pilot program: Hopewell Valley Central High School, Cooper University Hospital in Camden, the Caldwell wastewater treatment plant and the Pennington Department of Public Works building.

PSE&G is also developing a new program to increase the amount of energy storage capacity on PSE&G's electric distribution grid through five distinct energy storage efforts:

- Solar Smoothing, which makes the grid more reliable and mitigates voltage fluctuations on the grid produced primarily by changes in cloud cover;

- Distribution Deferral, which boosts capacity on select electric lines and defers the need for distribution system upgrades, saving millions of dollars.

- Mobile Storage for Outage Management, which leverages storage to reduce peak demands at substations that are under construction, resulting in more efficient construction projects.

- Microgrids for Critical Facilities, which enables critical facilities to maintain a reliable supply of electricity during an unplanned outage.

- Peak Reduction for Public Sector Facilities, which will locate energy storage systems at public sector facilities that will, in turn, help these customers manage costs by reducing electric use at peak times.

It's clear that customers are using energy differently today than in previous generations. Predictable usage curves that decades ago determined the optimal lay-out for the grid are currently being reimagined to account for on-site generation, electric vehicle charging, and the need for consumers to be "plugged in" at all times.

Continued investment is not optional if we are to meet challenges of an electrifying economy, installing modern digital technologies, deploying and serving more distributed resources, enhancing regional and interregional energy markets, lowering electricity prices for consumers, and strengthening the grid against physical, cyber, and natural disruptions.

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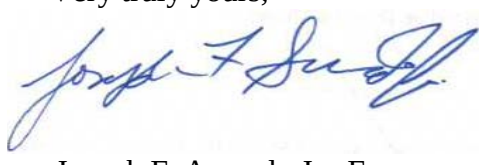
In conclusion, PSE&G continues to look forward to working with the Board and all stakeholders to ensure that we make the necessary grid modernization investments that are the very foundation of our state's economy and way of life.

Very truly yours,



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