October 12, 2018

Grace Strom Power, NJ BPU Chief of Staff and Chair, EMP Committee
New Jersey Board of Public Utilities
44 South Clinton Avenue
Trenton, NJ 08625

Dear Ms. Strom Power:

Enel respectfully submits comments for consideration as the Committee develops the 2019 Energy Master Plan in accordance with Governor Murphy's Executive Order 28. Enel supports New Jersey's 100% clean energy vision, and is eager to collaborate with the Murphy Administration, the Energy Master Plan Committee, the state's utilities, and other stakeholders to develop a comprehensive roadmap for clean energy innovation in New Jersey.

Enel is a global energy company operating in more than 30 countries with 72 million customers. Enel provides demand response and other advanced energy solutions to many of the largest energy users in the Garden State. Enel has deployed energy storage in over a dozen locations in the northeast. In addition, Enel builds and operates over 100 clean energy power plants across North America, including in the Garden State's regional grid, PJM.

Below, Enel recommends key goals and activities that can help the state achieve its important clean energy goals. Enel is available to respond to comments and looks forward to participating in the next stages of the 2019 Energy Master Plan. Please do not hesitate to contact me should you have any questions regarding our comments.

Respectfully submitted,

Brian Kauffman

Manager, Regulatory Affairs, Enel X North America

cc: Katie Guerry, VP, Regulatory Affairs, Enel X North America
Jack Thirolf, AVP, Regulatory and Institutional Affairs, Enel Green Power North America

New Jersey 2019 Energy Master Plan

Comments of the Enel Group Companies, October 12, 2018

Table of Contents

I. Introduction

Enel appreciates the opportunity to provide comments and recommendations to the New Jersey 2019 Energy Master Plan Committee. We commend Governor Murphy and the EMP team for launching this new vision. We presented and shared testimony at the Building the Modern Grid meeting and supplement those comments herein. Indeed, New Jersey has a valuable opportunity. Advanced, **clean energy jobs** are driving the economy throughout the country and the globe: a recent study found that Texas actually has more people employed in the new energy industry, than the oil and gas industry. New Jersey, with its exceptional human resources and prime location, can become a center of this economy in the Northeast.[1] Success in creating jobs is dependent upon success in the areas below.

[1] For more information on jobs see https://info.aee.net/clean-energy-jobs-reports. For the Texas study see https://www.texasadvancedenergy.org/#report

II. Recommendation Snapshot

Enel respectfully offers the following key recommendations:

- As a principle, encourage **competitively driven third-party investmen**t in grid modernization and clean job development and limit utility ownership of energy storage.
- Establish a goal of **100% clean energy** consumption as a complement to 100% clean energy production.
- **Plan for scenarios** in which New Jersey's **nuclear** fleet is unavailable and clean **power must come from renewable** resources.
- Implement a Clean Peak Standard and procurement mechanism to incentivize load shifting to support 100% clean energy.
- Create **strong and cost efficient bridge incentives for storage**, leveraging New York's ongoing analysis, to establish a $350 Million fund and adopt **robust procedures for applicants**.
- Embrace **Competitive Non-Wires Solutions** as clean, affordable **alternatives** to **costly distribution and transmission system upgrades**.
- Fully implement **A3723 peak shaving demand response** and utility performance incentive programs by mid-2019.
- Launch **natural gas demand response** as a non-pipes solution to building expensive gas infrastructure.
- Expand New Jersey's **clean transportation goals** to reach 2050.
- Invest in and optimize a **fully-networked electric vehicle (EV) infrastructure** in New Jersey to ensure support the **increasing demand** resulting from **increased transportation electrification**. Optimize the **flexibility and economic efficiencies** that infrastructure can provide to address the **increased supply intermittency** caused by New Jersey's increased renewable energy resource goals. This depends upon a number of **cost effective, demand side services at the bulk and distribution systems** that the smart or managed EV charging can provide via a built out EV infrastructure.

III. Enel Background

Enel, a global energy company serving approximately 72 million customers in more than 30 countries, is powering the clean energy transformation in North America through an innovative, diversified approach to energy production and management. With more than 1,500 employees in North America, Enel is the industry leader in both renewable energy and energy service solutions; it was the fastest growing renewable energy company in the U.S. and Canada in 2017 and is the leader in demand response through its acquisition of EnerNOC in 2017. We also provide a range of solutions for individual customers to use energy smarter including demand response, energy storage, and electric vehicle charging. Overall, Enel operates almost 10,000 MW of capacity in North America and works with thousands of customers here. Enel is a leading demand response provider to electric customers in New Jersey.

Enel operates in the U.S. and Canada through multiple distinct business lines, such as Enel Green Power North America and Enel X North America, which provide unique products, services, and investments to different segments of the energy market. Through these two divisions, Enel integrates power, technology and services to design customized energy solutions for organizations of all sizes. Its energy solutions create an opportunity for companies to meet their business goals, from energy cost-savings to enhanced sustainability practices and operations that are more resilient.

Enel X includes former companies EnerNOC, Demand Energy, and eMotorWerks, all of which Enel formally acquired in 2017. Enel X provides complete energy service solutions to businesses and consumers. Enel X partners with utilities nationwide to make the electric grid more affordable, reliable and clean. Since the acquisition, Enel X has increased its overall demand response capacity to 3.8 GW and is currently the largest demand response aggregator in PJM. Most relevant to energy storage, Enel X holds the leadership position in customer-sited energy storage systems in New York City. Since our first installation at the Glenwood Management-owned Barclay Tower in 2012 (then through Demand Energy), we have deployed 14 customer-sited projects representing 1.5 MW of capacity that provide multiple services to save energy users money and support the local grid. One of our most noteworthy projects has been

installing energy storage with solar and fuel cells for a new microgrid at the Marcus Garvey Village, an affordable housing complex covering nine city blocks in Brooklyn, New York that was ravaged by Hurricane Sandy. The Village had experienced among the highest rates of brownouts before the storm. Now, the Village has clean, back-up power and received the Energy Storage North America project of the year award.

eMotorWerks, part of Enel X, is a leader in the EV charging market with more than 33,000 units of residential and commercial electric vehicle supply equipment (EVSE) products installed worldwide. The company's cloud-based software platform, JuiceNet™, enables electric vehicles to become part of the smart grid ecosystem. JuiceNet™ is embedded in hardware manufactured by eMotorWerks (such as the JuiceBox™, the best-selling EV charger on Amazon) and by other major original equipment manufacturers. The JuiceNet™ platform enables eMotorWerks to control when and how fast chargers draw power from the grid, helping utilities and grid operators to reduce costs, ease congestion, provide demand response, and absorb low cost renewable energy to avoid curtailments.

Enel Green Power North America, part of the Renewable Energies division of the Enel Group, is a leading owner and operator of renewable energy plants in North America with projects operating and under development in 24 US states and two Canadian provinces. The company operates 100 plants across North America with a managed capacity exceeding 4.3 GW powered by renewable hydropower, wind, geothermal and solar energy. The company also develops utility scale energy storage projects globally. The company's 185 MW HillTopper wind project, currently under construction in Logan County, Illinois, will serve parts of the PJM market once operational, which is expected by the end of the year. Power from the HillTopper wind project will be purchased by several parties including Constellation and Comcast Spectacor to power 100% of the electricity needs of the Wells Fargo Center in Philadelphia.[2]

[2] For more information see https://www.enelgreenpower.com/media/news/d/2018/08/egp-with-constellation-to-power-sustainably-comcast-spectacors-wells-fargo-center-in-philadelphia

IV. Energy Master Plan Principles and Goal Setting

The Committee has raised questions in advance of each working group listening session thus far and is evaluating the ultimate goals of the Energy Master Plan. This section of our comments focuses on these big picture goals.

A. New Jersey should encourage third-party investment in grid modernization and limit utility ownership of energy storage

Companies such as Enel need an opportunity to provide solutions. That is our expertise. In a land-constrained and densely populated state such as New Jersey, customer-sited solutions will be especially critical to grid modernization. New Jersey can best achieve this through soliciting opportunities and driving competition for new and innovative cost-effective solutions for customers, not have the utility unilaterally plan the future of the grid.

Encouraging outside investment is key not just for companies that are experts in delivering energy solutions, such as our company, but competition will drive down costs so New Jersey businesses can succeed. Currently, electricity costs in the state are above the national average.[3] Driving down costs through electric industry competition for advanced energy projects creates a virtuous cycle: Businesses become more competitive in their own industries by having lower costs, and New Jersey becomes a more competitive state to run businesses, attracting greater investment.

New Jersey should adopt the policy that energy storage will not be owned by utilities, except in specific circumstances, such as when a third party has had the chance to develop a project but has not taken the opportunity. These opportunities must be clearly documented and the competitive electric sector should be provided ample time to respond. Electric de-regulation determined that generation should be competitively owned. Many storage systems will increasingly be co-sited with solar or wind generation to maximize the value of renewables. Allowing utilities to own energy storage would be a significant departure from this policy since

[3] As a point of reference, average electricity rates in New Jersey in July 2018 were 15.50 cents per kilowatthour for residential customers, compared to 13.12 cents per kilowatthour on average across the United States. Energy Information Administration, Electric Power Monthly, Table 5.6.A. Available: https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a

the generation and storage functions of a system will be increasingly intertwined. Ratepayers of New Jersey should allow shareholder capital, not captive ratepayer funds, to make investments in generation technology (either in front or behind the meter). Shareholder capital is best equipped to understand the risks and rewards of new technology and new regulatory models.

In particular, when it comes to energy storage that is sited with customer demand (and often coupled with solar or other energy generation), there should be a blanket ban of utility ownership. Allowing utilities to own energy storage on site with a customer load is not efficient for customers or ratepayers. First, storage in this context is often procured for demand charge management. Utilities themselves set demand charges with BPU approval. The utility has a naked financial interest in gathering demand charge payments, not reducing them. Pretending otherwise risks setting up customers and the utility for failure. In this case, failure could mean millions of dollars of ratepayer funds misallocated and storage systems that are poorly designed and managed. Private third parties are best positioned to design, build and manage customer-sited energy storage systems. Utilities can perform important functions, such as setting up financial incentives, procuring third-party implementation, and creating streamlined interconnection procedures. However, utilities should be required to hire third-parties to implement programs. In cases where a utility is overseeing a storage program, ownership should reside with a third-party. New Jersey should draw a clear line in limiting the utility's role in deploying energy storage or risk setting back clean energy goals considerably and harm the public confidence. This is not just to promote competition for innovative energy solutions, but also to allow the utilities to focus on providing best in class distribution services to their customers that allow customers to maximize the value of their own investments.

B. The Plan should guide New Jersey to both 100% clean energy production and 100% clean energy consumption by 2050

The guiding vision for the Plan is converting to clean energy. New Jersey is an energy importer currently, so the state must focus not only on energy production, but also energy consumption to fully capitalize on the environmental, economic, and health benefits of clean energy.

Enel recognizes the global challenge of climate change and we are working now across six continents to transform the electric grid and reduce the impacts of climate change. New Jersey, in adopting Executive Order 28, also recognizes the significant risks of climate change. In addition, the Order recognizes that consumption of energy is a major driver of climate change. The Order begins with several assertions:

- "Whereas, the international scientific and political communities have widely accepted that human activity is the main driver of global climate change and its corresponding deleterious impacts on our natural environment;
- Whereas, traditional methods of energy production that rely on the burning of fossil fuels release harmful emissions of carbon dioxide and other greenhouse gases, which in turn contribute to global climate change; and
- Whereas, in order to curtail the serious impacts of global climate change caused by greenhouse gas emissions, New Jersey must shift away from its reliance on fossil fuels as a primary energy source and turn to clean energy sources;"

The Order explains that anthropogenic climate change has serious negative impacts to our environment and stems largely from the burning of fossil fuels, and as a result, "New Jersey must shift away from its reliance on fossil fuels as a primary energy source and turn to clean energy sources". "Reliance" in New Jersey's case does not come in the form of fossil fuels produced in New Jersey (New Jersey does not have economic coal, gas or oil reserves), but rather, from fuels that are imported and burned in the state or burned outside the state (in the case of imported electricity).

Built into this rationale for the Order is the recognition that consumption is a contributing factor and as a result, it is incumbent on New Jersey to adopt a vision that focuses on consumption. While the Order later explicitly only talks about "the State's energy production profile", we can conclude from the original statements that the total vision for New Jersey is about curbing its share of greenhouse gases. Thus, focusing on consumption is key.

C. The state should conduct a comprehensive energy balance analysis of New Jersey's current production and consumption profile as well as future scenarios

This analysis should leverage materials such as EIA data to assume current production and consumption behavior, as well as potential changes resulting from economic growth and electrification of certain energy end-uses. This energy balance analysis will be useful to develop scenarios on total clean energy production and consumption goals for 2030, 2050 and between. Scenarios for the future should include:

- Nuclear generation continues as it does today
- One or more existing nuclear generators close at the end of their planned lives
- Transportation energy shifts to electric from petroleum
- End use natural gas consumption falls considerably as a result of fuel switching to electric[4]
- New Jersey achieves its renewable energy goals

D. New Jersey should set intermediate goals to support achievement of 2050 goals

We believe that the state would be well-served by setting intermediate targets to evaluate its progress along the pathway to 2050 goals. Such intermediate goals could be defined starting in 2025 and for five-year periods hence, in 2030, 2035, 2040, and 2045.

E. Conclusion

In conclusion, the goal setting process should be analytically robust, transparent, and provide alternative scenarios that give insights to policymakers on issues that will influence New Jersey's achievement of 100% clean energy, including recognizing that some of the state's largest generators of clean energy now may have to be decommissioned by 2050. The state should develop scenarios in which these resources will be replaced with new clean energy. Competition should be enshrined as the policy of New Jersey for bringing new investment to the state.

[4] New Jersey consumed 795.4 trillion BTU of natural gas in 2016. This number has likely increased since 2016. EIA New Jersey State Profile and Energy Estimates, Table F19: Natural Gas Consumption Estimates, 2016. Available: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_use_ng.html&sid=US&sid=NJ

V. Activities to Achieve New Jersey's Goals

Setting robust goals for the state is the first step; the next step is determining how to get there. New Jersey already has significant energy policies on the books, although to achieve 100% clean energy, major new policies will be necessary. In addition, many policies that have been adopted in the last year require focused initiatives to implement.

In this section, Enel provides recommendations on high-level policy mechanisms that will be critical to achieving the state's clean energy goals. Our comments are intended to be useful to a wide audience. While we have preferred to keep our comments high level, in some cases we have added details that are valuable to designing an effective policy mechanism.

Below, we discuss key enabling policies that New Jersey should adopt to achieve ambitious clean energy production and consumption goals. These include:

- Adopt a Clean Peak Standard and Procurement Mechanism
- Implement Energy Storage Incentives
- Address Energy Storage Soft Costs, including Interconnection
- Maximize peak shaving demand response for interruptible electric *and* gas customers
- Encourage competitive Non-Wires Solutions
- Influence wholesale market initiatives at PJM to support New Jersey's clean energy integration goals
- New Jersey's 100% clean energy goal should cover consumption from the transportation sector

A. New Jersey should adopt a Clean Peak Standard to drive the push to 100% clean energy

Today, 29 states and the District of Columbia have renewable portfolio standards ("RPS") that require a certain percentage of the state's electricity to come from renewable energy and track compliance through the use of renewable energy credits ("RECs"). Traditionally, state RPS policies require retail electric providers to supply a minimum percentage of their retail load (in MWh) from renewable resources. While a traditional MWh approach provides necessary energy, it does not create a market for the necessary, flexible energy storage capacity and peak

shaving activity required to facilitate intermittent renewable generation and time-shift this energy production to the peak period of use.

1. Procurement

A Clean Peak Standard with a procurement mechanism is a valuable complement to New Jersey's ambitious RPS. As the RPS requires more intermittent renewable generation to join the market, energy prices may drop, while flexible capacity products will become more important to maintaining the balance between customer demand and market supply.

Enel recommends that New Jersey implement a program to directly procure resources, including storage, renewables, and demand reducing technologies and services, that can deliver clean energy during peak periods. We will refer to this as a "Clean Peak Procurement Mechanism" or "CPPM" and the compliance mechanism as a "Clean Peak Certificate" or "CPC." All load-serving entities should be obligated to procure and retire a proportion of their load through clean peak resources via purchase and retirement of qualifying CPCs. Eligible resources include all of the following:

- New renewables with a commercial operation date after January 1, 2019, that deliver into peak hours without installing an energy storage resource
- Existing renewables that install an energy storage resource to store and shift their energy production into peak hours
- Stand-alone energy storage resource that charges during low-emitting hours when renewable resources are on the margin
- Load shifting demand resources that demonstrate consistent shifts from peak-emitting hours to low-emitting hours

The CPPM will allow participation by all three energy storage market segments (customer-sited, distribution system, and bulk system) and the LSE compliance obligation will guarantee deployment across New Jersey based on system needs. New Jersey should allow for multi-year contracts and procure CPCs through annual solicitations. This will ensure that there are consistent sources of CPCs and provide revenue certainty to developers. This can be a stand-alone solicitation for CPCs or it can be included in a large-scale renewables procurement where

CPCs receive a higher value than renewable energy credits (RECs) due to the additional services provided to the grid.

B. New Jersey should implement energy storage bridge incentives immediately to jump start the market

New Jersey set an important goal to have 600 MW of energy storage online by January 1st, 2021 and 2,000 MW by 2030. Broadly, energy storage comes in three variations: customer-sited, distribution-connected, and bulk-power system connected. Energy storage holds the promise to be the one of the most transformative set of technologies in our generation. Setting these ambitious storage goals has catapulted New Jersey into the highest echelons of states prioritizing technological innovation and sustainability. Delivering on the goals may appear more complicated, however, due to natural dynamics driving energy markets and many questions that exist around energy storage technologies. However, it is vital that New Jersey focus on deployment and commercialization immediately. The long term resilience and economic advantages will pay dividends, protecting New Jersey ratepayers and businesses from reliability concerns and negative market forces.

Delivering on these ambitious energy storage goals will be incredibly valuable in terms of job creation and economic development in the state. The New York Energy Storage Roadmap ("the Roadmap"), a comprehensive analysis conducted by New York Department of Public Service ("DPS") and New York State Energy Research and Development Authority ("NYSERDA"), provides innumerable insights that can be applied next door in New Jersey. New York and New Jersey have similar goals when it comes to clean energy development. The Roadmap, released June 21, 2018, concluded that New York's energy storage target of 1,500 MW by 2025 would create up to 30,000 jobs and provide $2 Billion in consumer benefits.[5] New York did not review storage targets above 1,500 MW; however, with New Jersey's larger goal of 2,000 MW, we can conclude that jobs and consumer benefits are potentially even greater here.

[5] *New York State Energy Storage Roadmap and Department of Public Service / New York State Energy Research and Development Authority Staff Recommendations*, June 21, 2018, Page 5. Available: https://www.nyserda.ny.gov/All%20Programs/Programs/Energy%20Storage/Achieving%20NY%20Energy%20Goals/The%20New%20York%20State%20Energy%20Storage%20Roadmap

1. Timing

While many companies including ours are eager to develop energy storage projects in New Jersey, the economics today can be challenge, particularly with significant uncertainty in market rules, including long interconnection processes. Financial incentives now will reduce risk and make these projects possible. As a developer, we are keenly aware of the time needed to build projects based on the current timeline. The next round of planning at PJM occurs in March 2019. We have found that interconnection times vary by project size:

- >20 MW requires 2-2.5 years
- 10-20 MW requires 1.5 years
- Up to 10 MW requires 1 year

Given the long lead times, it is important to have projects in the PJM queue by March 2019 in time to achieve New Jersey's January 1st, 2021 600 MW goal. Considering the long lead time at PJM for interconnecting storage, if projects have are not in development by March 2019 it is likely impossible that new bulk-system utility scale projects can be online by January 1, 2021.

2. Incentive Levels

New York has proposed energy storage incentives of approximately $350 million in bridge incentives to accelerate adoption of customer-sited storage and storage sited on the distribution or bulk systems, including when paired with clean generation sources.[6] New York also has several other packages of financial resources, including monies earmarked for solar plus storage projects, which provide additional resiliency benefits to customers.

Storage incentives can help New Jersey achieve its clean energy goals. Enel has identified potential utility scale and customer-sited projects in the state, but financial bridges are needed to make them economically feasible at this time. With transparent and attractive incentives, storage projects could be greenlit immediately, accelerating the benefits storage provides. New York plans to achieve roughly **500 MW of storage by 2021-22** through spurring the market with incentives. Incentives are the key tool to rapidly deploy storage and drive competitive

[6] *New York Energy Storage Roadmap*, Page 49

investment. According to the New York analysis, "Staff estimates that such an incentive program could support a significant amount of customer-sited and distribution/bulk sited storage by 2021-22 while accelerating cost declines, deploying over one-third of the 1,500 MW 2025 target, and establishing critical foundations for a self-sustaining market without direct incentives." More storage, online faster, is anticipated to save the system and ratepayers money. The New York analysis finds that incentives result in approximately $200 million saved from the projected costs by 2025 and $400 million by 2030.

Regional markets, such as PJM, are just beginning to develop market rules that will send appropriate price signals for energy storage to stack revenues and provide multiple services. Practically all of the energy storage in operation now in PJM is only providing frequency regulation. While this was an important step in harnessing the value of storage, it will be a long time before PJM incorporates energy storage in the market. In the meantime, state incentives can bring storage online faster and motivate the market.

States such as New York and Connecticut have created "Green Banks" to provide market acceleration to in-state clean energy. We recommend the Plan to address creating a Green Bank that would be tasked with managing an incentive program long term. However, given the short-term goal to make funds available and accomplish the goals set forth in New Jersey's state law, we recommend the BPU to oversee a streamlined incentive application process in 2019 to galvanize the market.

3. Application requirements to receive incentives

As to the design of incentives for storage, we wish to underscore the following points:[7]

- The incentive should be available to customer-sited, distribution-connected, and bulk-level energy storage device;
- To qualify for an incentive, the applicant should demonstrate site control, potential to finance, record of accomplishment, and interconnection queue position;

[7] For additional information, see Enel Comments on *New York Energy Storage Roadmap*, September 10, 2018. Available: http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=55960

- The Commission should explore requiring financial assurance for those who receive incentives until their project becomes commercial to eliminate speculative behavior;
- The Commission should establish milestones that those who receive incentives would need to meet in order to retain incentives before commercialization, while recognizing that interconnection challenges can delay projects. This requirement should ensure that rewarded projects move quickly or forego incentives;
- While we caution against any onerous operational requirements, incentive recipients for customer-sited resources must demonstrate that they are using the battery either for demand charge management, participation in a utility program or tariff, or the PJM market. The same would be true for a distribution-connected resource (or Non-Wires Solution), with the exception of demand charge management. Recipients of bulk-level resources could demonstrate compliance through participation in PJM wholesale markets or a load-serving-entity contract that reduces the amount of capacity to procure; and
- An applicant should be encouraged to value stack, but multiple market participation should not be a precondition to receiving an incentive.

C. New Jersey should address energy storage soft costs, including interconnection, through expansion of the existing interconnection working group at the BPU to focus on state level issues, and integration with PJM's DER Subcommittee to address wholesale market barriers

The New York Storage Roadmap notes that while hardware costs continue to decline, soft costs, including customer acquisition, siting and permitting, and interconnection, are driven by local factors that do not decline in parallel. These soft costs can make up 20 percent of total costs of a project. If these costs do not decline, they will actually increase relative to the total share of a project as hardware costs fall from rapid innovation.

Our experience has found that interconnection can take from one to over two years on customer-sited and bulk-system utility-scale projects. When it comes to state interconnection procedures, we have found that some requirements can make energy storage projects challenging, even when projects do not plan to inject power onto the system. There are

additional challenges when a project is anticipating to receive value from selling electricity onto the system. PJM's Distributed Energy Resources Subcommittee (DERS) is currently reviewing bottlenecks in the interconnection process and opportunities to partner with utilities and states to streamline interconnection studies and requirements.

New Jersey has an opportunity right now to impact its own energy storage development not just by participating in the PJM process, but also by requiring a distribution system interconnection processes for behind the meter, customer sited, resources. Our experience in the deployment of customer-sited storage, is that the physical interconnection with the utility can be the largest barrier to completing a project, which deters investment from competitive developers. The primary driver for this outcome is the lack of defined interconnection rules for customer-sited storage under their utility tariffs. Our C&I customers are developing these resources for a multitude of reasons such as in support of resilience, to address energy costs, to satisfy corporate sustainability goals, to attract quality talent. New Jersey's leadership in utility interconnection rules will help drive investment. Consistent, clearly defined, and time bound interconnection requirements and cost allocation mechanisms are key to New Jersey attracting the behind the meter storage investments necessary to accomplish the established storage goals.

D. New Jersey should implement demand response electricity peak shaving programs

Enel congratulates New Jersey's lawmakers for leading the way toward robust peak shaving and energy efficiency targets through Assembly Bill 3723. The law specifies utilities to achieve a 2% annual reduction in electricity and 0.75% annual reduction in natural gas relative to the average in the prior three years. The law also asks the BPU to conduct a study on the cost-effectiveness of this initiative and to direct goals that are greater if they are deemed cost-effective. The law also directs the BPU to establish quantifiable performance indicators for each electric public utility and gas public utility, which establish "reasonably achievable targets."[8] In recognition of these efforts, the American Council for an Energy-Efficient Economy (ACEEE) 2018 State

[8]New Jersey Assembly Bill 3723, Section 3, Approved May 23, 2018. Available: https://legiscan.com/NJ/text/A3723/2018

Scorecard increased New Jersey's ranking by five spots over the prior year to be tied for 18th in the country.[9] While there is still a lot of room to grow, this makes the Garden State one of the fastest moving states in the country.

The Energy Master Plan should call on New Jersey to swiftly implement broad demand response programs to help customers take control of energy spend and reduce pollution. The requirements set out in A3723 should be considered a base-line to develop a foundation for retail demand response in New Jersey. In addition to peak shaving, there is also great opportunity to build and encourage complementary demand response programs that perform different functions in the energy system, including emergency/pre-emergency DR, load shifting, and Non-Wires Solutions. Customers should be encouraged to participate in multiple programs to increase the values of their investments. Finally, New Jersey should implement A3723 performance incentive rate structures (and additional rate designs as needed) to incentivize utilities to promote and serve as an active ally to third-party competitive energy service companies to implement distributed, clean energy solutions. If utilities are not incentivized properly it may stand as a major barrier to achieving the Energy Master Plan goals.

1. State Level Peak Shaving Programs

As the state considers demand management solutions, it is useful to consider several types of demand response. There are several types of demand response, including:

- Emergency/pre-emergency based on preventing and managing emergency operations on the bulk power system (such as, PJM's emergency load response program);
- Peak shaving, to reduce peaks on the system so ultimately customers buy less and put less stress on the distribution system (such as, Pennsylvania Act 129); and
- Non-Wires Solutions to defer costly solutions for substation overloads when approaching critical conditions (such as, Brooklyn Queens Demand Management "BQDM"); and

[9] Berg, Weston, et al., *2018 State Energy Efficiency Scorecard*, American Council for an Energy Efficient Economy, October 2018. Available: https://aceee.org/sites/default/files/publications/researchreports/u1808.pdf

- Load shifting demand resources that demonstrate consistent shifts from peak-emitting hours to low-emitting hours.

"Demand Response" is a facet of grid modernization and opens up alternatives to consuming electricity, which has a litany of benefits, including driving technological innovation, creating local jobs where energy is used, reducing pollution, and saving customers money. Most importantly, Demand Response can take many forms and serve multiple purposes at the same time. Already, the regional grid operator, PJM, runs emergency/pre-emergency DR that pay over 1,500 locations in New Jersey to be available to reduce electricity in case of emergency. These locations are spread across the state and include customers in the major electric utility territories: Atlantic City Electric, Jersey Central Power & Light, Public Service Enterprise Group and Rockland Electric Company. Together, these 1,500 locations cumulatively can curtail over 485 MW, the size of a significant power plant. PJM calculates that electric customers at these locations will be paid roughly $50 Million in 2018 for participation in this program.[10]

However, New Jersey doesn't have to, and shouldn't, depend on PJM; New Jersey can develop its own state-level peak shaving programs that run complementary to PJM's programs. FERC's National Assessment of Demand Response Potential, a joint study by the Brattle Group and other partners, projected that in 2019, New Jersey had an achievable potential to reduce demand by 12%. This study concluded that just large commercial and industrial customers in the state could cumulatively achieve roughly 1,000 MW of peak reduction.[11]

Thus, it is vital that New Jersey has its own peak shaving programs. From an environmental perspective, this is also good business to curb electric generation at peak hours when carbon emissions are often the highest (within and outside of New Jersey). The environmental profile of electricity from across PJM will likely continue to lag behind that of New Jersey. Thus, New

[10] McAnany, James, *2018 Demand Response Operations, Market Activity Report: Sept 2018*, PJM Interconnection, Inc., September 10, 2018. Available at: https://www.pjm.com/-/media/markets-ops/dsr/2018-demand-response-activity-report.ashx?la=en

[11] Faruqui, Ahmad, et al. *National Assessment of Demand Response Potential*, FERC Staff Report, June 2009. Available: https://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf

Jersey's goal of 100% clean energy (from a production and consumption standpoint) can be more rapidly achieved by reducing demand on PJM RTO-wide generation.

The environmental benefits of peak shaving can be estimated as follows: for every 1 MW of peak reduction that is achieved, that is 1 MW less of generation that is needed by NJ to meet peak demand in or outside of the state. Peak shaving at just a handful of key times over the course of a year can result in avoiding thousands of MWhs from the dirtiest of power plants. This has been well documented. A 2014 Navigant Consulting study commissioned by the Advanced Energy Management Alliance found that demand response should be a "strategic part of implementation" of carbon reduction goals and could cut the carbon dioxide equivalent of six coal-fired power plants.[12]

Peak shaving is a fast and cost-effective way to meet peak electric demand. Pennsylvania, New York and a host of other states have their own programs that save all customers money. These programs operate via an independent consultant hosting a centralized procurement process to identify and pay energy users to reduce load at peak times. Currently, price signals will not incentivize this behavior meaningfully. Through this specific peak shaving incentive program, the system will reduce load at the busiest times, and thereby avoid costs when energy is priciest and often dirtiest. Funding for peak shaving, can be developed by using a new or existing non-bypassable surcharge to all customer bills. For instance, the Societal Benefits Charge could be used as a means to collect revenue that can be spent on this program. When compared to the costs, the benefits of these programs are usually much greater.

2. Example Peak Shaving Programs from Other States

Pennsylvania's Act 129 DR programs, operated by Pennsylvania Electric Distribution Companies ("EDCs"), are economic programs for C&I customers. These customers are dispatched during periods of summer system peak and are intended to reduce costs for Pennsylvania consumers. Pennsylvania's programs began in Phase I of Act 129 from 2009 to 2013. In Phase III the state's programs were re-designed and launched for 2017 to 2020. In Phase III, each of the state's

[12] Navigant Consulting, Inc., *Carbon Dioxide Reductions from Demand Response*, November 25, 2014. Available: http://aem-alliance.org/download/10680/

EDCs must meet separate goals. The goals were set through a cost-effectiveness study conducted by the Public Utility Commission's Independent Statewide Evaluator. Pennsylvania has projected the DR benefits to exceed costs at a ratio of 1.78. While some utilities may perform at different levels, performance cannot be shared or traded among utility territories. Dispatches are based on day-ahead PJM conditions. The trigger is a day-ahead forecast of 96% of PJM's RTO peak load forecast. Thus, the utilities will generally know 24-hours before an event. New York's Con Edison has had peak-shaving programs for many years that are incremental to NYISO emergency programs. The benefit-cost ratio for Con Ed's programs was 1.82 in 2015 with $250 M in expected net benefits. As a result of the success of these programs, in 2016 the NYPSC ordered every utility in the state to create programs similar to Con Ed to start in summer 2017. The Eversource and National Grid programs in Massachusetts have advantages but also entail their own challenges. In general, Enel supports a three year or longer program duration to provide successful returns on initial investments.

3. Design Elements of Electric Peak Shaving

Enel X (formerly EnerNOC) has implemented 14 utility peak shaving programs nationally over the last decade. Eight of these are active currently. Enel X is launching two more programs in the coming months. Many programs are designed differently. For instance, in some cases we work directly for a utility to deliver a program. In other cases, we work on behalf of an independent entity. We can work in multiple modes. It is more important that the program is designed effectively. One lesson we've learned is that dispatching customers on a day-ahead basis can result in over-dispatching, which can be more costly to implement. As a result, we recommend using a 2-hour ahead dispatch trigger, rather than a day-ahead trigger. In addition, many states have peak shaving targets that are allocated to each utility within the state. These targets are set based on predicted electricity demand. However, real-life conditions are often dependent on economic and weather that can vary year to year. One way to make goals realistic is to allow utilities within the state to trade performance among themselves. For instance, take an example of two utilities that both have compliance targets of 100 MW per season. If Utility X has achieved 25% over its target, while Utility Y has achieved at 25% under its

target, allow these utilities to trade performance so that as a state, the utilities are compliant. This helps make programs most cost-effective for ratepayers.

4. Support Participation in Non-Exclusionary Complementary Programs

New Jersey should specifically support customers participating in complementary DR programs. Pennsylvania encourages customers to participate in both state Act 129 programs and PJM wholesale DR Emergency Load Response Programs. Dispatches for Act 129 programs, which occur at 96% of system peak, are likely to occur outside of dispatches for the PJM program, which only occur during grid emergencies. History demonstrates that load will exceed 96% of peak without normally resulting in a PJM reliability-based dispatch. Moreover, there could be a PJM dispatch due to generator or transmission outages even if load did not exceed 96% of system peak, as evidenced by the Polar Vortex. Again, if a customer participated in just the PJM program, but not the Act 129 programs, the incremental value of the Act 129 program would not be realized by Pennsylvania consumers. The opposite is also true: if a customer participated in the Act 129 programs but not PJM, the benefits of wholesale DR participation would be unrealized. It would not serve New Jersey's interests to force customers to choose between state and PJM DR programs.

In 2018, PJM and stakeholders worked together to develop a new PJM peak shaving program. The outcome of this initiative is not final at this time. Based on the current proposal for that program there is no opportunity to participate in both PJM's wholesale emergency DR program and this new PJM peak shaving program. It is explicitly forbidden for a customer to do both PJM's wholesale emergency DR program and any new PJM qualifying peak shaving program. For customers that can't meet program requirements of wholesale emergency DR, this new PJM peak shaving program may be a good option.

The PJM peak shaving program may not be useful to New Jersey for its peak shaving needs if total incentives to potential customers were less than the status quo. We encourage the New Jersey BPU staff to embed themselves in the details of these programs. Indeed, states now operate peak shaving without PJM. New Jersey may find it optimal to (1) implement commercial and industrial customer state level peak shaving programs outside of the PJM peak

shaving program as Pennsylvania now does, and (2) enable those customers to also provide PJM emergency DR to the wholesale market as a complement.

E. New Jersey should implement natural gas demand response programs to evaluate and ultimately scale these nascent programs

Dependence on natural gas represents a key challenge to New Jersey's clean energy goals, particularly from end-use consumers and electricity generation. For instance, according to the Energy Information Administration, "(a)bout 75% of New Jersey households rely on natural gas as their primary heating fuel, 12% use electric heat, and 10% depend on heating oil". New Jersey does not have any economically recoverable natural gas reserves. New Jersey is actually consuming more natural gas than it did in the past; since 2010 national gas consumption for electricity generation has increased by more than 33%.[13]

Natural gas DR can be a valuable tool in regions that are constrained by natural gas fuel capacity. New Jersey typifies this situation. Pipeline siting is a long and arduous process and increasingly, communities have fought to prevent new pipelines from being in their backyards. Pipelines are long term investments that once built, must be paid for over many decades. Many pipelines that are already in existence can be used more efficiently. In fact, most pipelines are used at full capacity only rarely.

Natural gas DR is an environmental step forward to meeting demand. First, actively curtailing peak use of natural gas can lead to less need for new infrastructure, which many communities do not want in their backyards. Natural gas DR can result in less consumption of natural gas in the short term by shaving the peak, resulting in fewer therms burned. In addition, NG DR supports a shift to alternative energy choices, namely electrification. Rather than build the gas infrastructure technology of yesterday, financial resources can be committed to building the clean energy infrastructure of tomorrow. The savings from deferred asset investment, rather than the avoided fuel consumed, generally represents the largest share of savings to customers.

[13] Energy Information Administration, New Jersey State Energy Profile, July 19, 2018. Available: https://www.eia.gov/state/?sid=NJ#tabs-5

Natural gas DR is also an economic play. While common knowledge is that fracking has driven domestic natural gas prices down 70% since 2008, extreme volatility is still common at major delivery points because of pipeline capacity constraints. Similar to the electric system, new capacity is not capital efficient to meet short term constraints in the natural gas system. Considering the options to mitigate pipeline constraints, demand response is the least capital intensive and quickest to market. Options such as increased end-use efficiency and installing back-up fuel (electrification) are also environmentally sound, but more capital intensive and slower to materialize. Options such as increased storage, importing liquefied natural gas, building pipelines or expanding electrical transmission (as an alternative to natural gas use for electricity generation) are considerably more expensive and long-term investments.

New Jersey lawmakers saw great promise in natural gas DR in passing A3723 and Enel applauds this effort. While it holds promise, NG DR is relatively new. Early stage NG DR is in existence now across four states: New York (Consolidated Edison and National Grid), Florida (Chesapeake Energy), Iowa (Alliant Energy) and California (SoCalGas). Enel X anticipates participating in the ConEd program in the future.[14] Enel X is learning about the market opportunity and how customers are best positioned to provide this service to the system. In New York's case, a significant driver of NG DR has been targeted efforts to encourage customers to switch from heavy fuel oil to natural gas. Con Ed calculated a potential benefit of 500 tons of carbon/year for this switch. New Jersey may adopt a similar focused effort to eliminate fuel oil from its fuel mix (now 10% of residential fuels) and include DR as a method to limit possible over-dependence on natural gas.[15] New Jersey could also leverage NG DR as part of a broader effort to reduce the need for new pipeline capacity.

[14] Petition of Consolidated Edison Company of New York, Inc. for Approval of the Smart Solutions for Natural Gas Customers Program, September 29, 2017. Available: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EBDD5DAE-ED57-4D90-BFF7-B407517BE133}. Full docket: http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=54621

[15] More information on ConEd's fuel oil to gas conversion program available at https://www.nyccleanheat.org/content/what-nyc-clean-heat and https://www.edf.org/clean-heat-new-york-city

As New Jersey staff develop programs, a key element to consider that these programs are very new on a national basis and, in particular, efforts to encourage customer participation are nascent. In its early stages, a key recommendation is to not make NG DR responsible for meeting a 1.0 benefit-cost ratio. In their wisdom, lawmakers in A3723 required each utility to establish portfolios to meet a 1.0 benefit-cost ratio. However, each program can range above or below. For new programs that have not been used widely in the region before, such as NG DR, it would be wise to budget significant consumer education. In its first year, Enel recommends budgeting also for generous incentives to customers for participation.

F. New Jersey should implement Non-Wires Solutions as part of its grid modernization strategy

Non-Wires Solutions are generally defined as any geo-targeted action or strategy that could help to defer or eliminate the need to construct or upgrade a transmission system and distribution substations. Non-Wires Solutions have demonstrated themselves most effective on radial systems at risk with N-1 reliability. Non-Wires Solutions efforts may include, but are not limited to, energy efficiency, demand response, dynamic pricing, distributed generation, energy storage, and volt-VAR optimization.

Historically, as energy use increases in a specific place, a bottleneck can occur. Energy demand can be forecasted to overload the capacity of the distribution equipment including wires, transformers, and protection equipment, which serves a given area. Upgrading wires and the substations that serve them can cost hundreds of millions of dollars, and new substation builds can push costs into the billions. Non-Wires Solutions provide an alternative to building new transmission and distribution lines, which can occupy critical public space and eliminate preserved public land. The use of public space is a key issue in New Jersey, which has the highest population density of any state in the nation; nearly 1,200 people per square mile.[16]

New Jersey could adopt Non-Wires Solutions in multiple ways. First, the state could adopt a policy that all distribution infrastructure upgrades must first look at Non-Wires Solution before

[16] Energy Information Administration, New Jersey State Energy Profile, July 19, 2018. Available: https://www.eia.gov/state/?sid=NJ#tabs-5

contemplating wires solutions. Second, the state could also initiate a review of focused parts of the distribution system that are likely future candidates for overloads and request each utility to begin a plan for Non-Wires Solutions that would be assessed prior to and separately from a distribution system upgrade plan. Many regions now are adopting the viewpoint that all solutions to bottlenecks in transmission and distribution should be reviewed before new wires are built. Often, it is more affordable to help customers use less energy or use it at better times. Brooklyn, for instance, had an overloaded substation problem that would have required $1B of traditional wires solutions to fix. Instead New York and ConEd decided to obtain a mix of local solar, batteries, demand response and energy efficiency that costs ratepayers one-fifth of the price. These programs can be paid for by distribution planning charges similar to existing distribution charges but can save customers compared to traditional choices.

As part of a Non-Wires Solution effort, Enel recommends that the BPU review rate design, particularly with regards to how demand charges are applicable to energy storage. After all, energy storage as a Non-Wires Solution replaces the need for network upgrades, and thus does network service. Enel welcomes the opportunity to provide further input on rate design.

1. Benefits to Reducing Regional Grid Costs

The concepts of demand response and Non-Wires Solutions can be implemented at the state level. However, both programs can be used to solve regional grid (wholesale) market costs, as well. First, initiating a robust state-level Demand Response peak shaving program reduces customer costs for their full energy spend, including wholesale and retail charges. Regular peak shaving can avoid the need for new generation and transmission upgrades by impacting the regional peak over time. Another way state peak shaving enables greater reduction in wholesale costs is that state peak shaving has been effective in increasing participation in PJM's wholesale DR program. Customers participating in one program, participate in the other. New Jersey should explicitly allow customers to participate in both programs.

Finally, there is growing interest in implementing Non-Wires Solutions at the regional level as an alternative to bulk power transmission upgrades. For instance, large arrays of energy storage could be used as a transmission alternative. New Jersey should request that PJM's Regional

Transmission Expansion Plan assess Non-Wires Solutions. The batteries could charge and discharge at peak times to balance loads and reduce pressure on transmission bottlenecks. As part of its state rulemaking, New Jersey could create clarity over transmission investment to detail the process for siting batteries used as transmission alternatives. This has the potential to help solve the transmission bottlenecks in New Jersey that lead to high capacity prices.

G. New Jersey should advocate to PJM for improved wholesale rules and standards for energy storage, renewable energy, and distributed energy resources

Below is a select list of key initiatives to participate in at PJM. First, we recommend New Jersey staff work closely with PJM and New Jersey utilities to align state and wholesale market interconnection requirements to get more projects on the system faster and affordably. As we have noted above, our experience in wholesale markets has found that interconnection, can take from one to over two years on customer-sited and bulk-system utility-scale projects. PJM's Distributed Energy Resources Subcommittee (DERS) is currently reviewing bottlenecks in the interconnection process and opportunities to partner with utilities and states to streamline interconnection studies and requirements. Second, FERC Order 841 requires PJM to eliminate market barriers to energy storage. PJM plans to file its plans for compliance by December 2018 and implement these rules by December 2019. New Jersey can encourage strong rules that recognize the benefits of storage. Finally, PJM is beginning to review the capacity value of energy storage to bulk power system reliability. New Jersey can provide important insights to any study or stakeholder initiative, especially as the Garden State becomes a leader in energy storage deployment in PJM.

H. New Jersey's 100% clean energy goal should also cover the transportation sector, and the state should prioritize investments in smart, networked electric vehicle charging infrastructure

Transportation consumes more energy and contributes more GHG emissions than any other sector in the state. To illustrate this, on-road transportation has accounted for approximately 40-50% of New Jersey's GHG emissions over the past decade, compared to 20-30% from

electricity generation.[17] New Jersey ranks among the top 10 states in petroleum product consumption. Beyond the ChargEVC target of 330,000 EVs on the road by 2025, New Jersey should develop aggressive interim targets to decarbonize the clean transportation sector over five-year increments through 2050.

1. Significant investments are needed to implement the clean transportation economy in the state

The primary obstacles facing clean transportation implementation are infrastructure availability, electric system modernization, and the price differential between electric vehicles (EVs) and internal combustion engine (ICE) vehicles. As discussed throughout these comments, the state can address these obstacles by incentivizing clean transportation technology through a combination of ratepayer- and taxpayer-funded investments and market mechanisms. Electric utilities can make foundational investments in distribution infrastructure needed to support electrified transportation, provide customer rebates for charging equipment purchases, and adopt rates for charging electricity that outcompete gasoline. The state can establish a Low Carbon Fuel Standard (LCFS) that requires fuel providers to reduce the carbon intensity of their fuel, and initiate an LCFS credit market in which clean fuel providers generate credits and can earn market revenues through selling compliance credits to fossil fuel providers. LCFS market revenues can be used in a variety of ways to incentivize clean transportation adoption, by funding point-of-sale EV rebates or utility EV supply equipment (EVSE) rebates, or by supporting the business activities of EV service providers (EVSPs), EVSE manufacturers, or automotive original equipment manufacturers (OEMs). The state can match LCFS-funded incentives with state taxpayer funds and can also extend taxpayer funds to assist in the electrification of public transit, ride sharing, and state-owned and operated fleets. Finally, New Jersey can explore ways to leverage third-party financing to multiply the effects of state taxpayer investments in clean transportation infrastructure.

[17] *Greenhouse Gas Emissions in New Jersey, Environmental Trends Report,* NJDEP, Division of Science, Research and Environmental Health, October, 2017. Available: https://www.nj.gov/dep/dsr/trends/pdfs/ghg.pdf

2. Vehicle-grid integration (VGI), or using flexible EV charging as an intelligent, grid-edge distributed energy resource (DER), should be a first principle for all transportation electrification (TE) infrastructure investments in New Jersey

Transportation Electrification (TE) will add substantial new loads to the grid and can result in unnecessary electric system upgrade and integration costs and/or operational challenges if deployed in an unmanaged or uncoordinated fashion. VGI can provide multiple services to customers, utilities, and wholesale energy markets, and can help integrate the levels of intermittent renewable energy resources called for by Executive Order 28. VGI can also ensure that EV charging occurs when the availability of renewable energy is highest.

3. New Jersey should focus its efforts on the customer segments and charging use cases that entail relatively lower up-front costs and/or barriers to fuel switching if it is to meet its 330,000 ZEVs by 2025 goal

Enabling customer adoption of light-duty passenger vehicles is relatively cheaper and easier than, for instance, enabling electrification of heavy-duty freight. To achieve this, customers must see a clear financial benefit to going electric, meaning that electricity as a fuel must be noticeably cheaper than gasoline, that the up-front costs of EV charging infrastructure is minimized, and that the price premium of buying an EV versus an internal combustion engine (ICE) vehicle is minimized.

First, Time of Use rates with a significant differential between on- and off-peak periods incentivize charging when grid impacts are relatively low and allow electricity to run considerably cheaper per mile than the equivalent amount of gasoline.[18] Next, utility investment programs that entail "make-ready" infrastructure build-out and provide EVSE purchase and installation rebates for single- and multi-family residential, commercial, workplace, and fleet customers lowers the up-front cost of charging infrastructure and provides a number of short-term and long-term charging options that reduce range anxiety. Finally, state-level EV purchase rebates and auto OEM discounts can work alongside federal EV tax

[18] For more information see https://www.energy.gov/maps/egallon

incentives to reduce the premium of EVs over ICE vehicles and encourage early adopters to make the switch.

4. Electric utilities, as the primary fuel distributor for TE, have a central role in promoting and enabling the clean transportation economy

First and foremost, utilities can orchestrate EV infrastructure buildout through investment programs for make-ready infrastructure, EVSE purchase and installation, and back-end IT and communications systems that can oversee smart charging dispatches for grid integration purposes. Utilities can also ensure that new loads from TE are integrated into the grid in the most seamless and cost-effective manner possible, through a variety of different methods:

i. The utility can adopt EV time-of-use rates with significant differentials between on-peak and off-peak periods. This will ensure that electricity is considerably cheaper than gasoline, charging doesn't exacerbate peak load, and non-participating customers benefit from spreading fixed infrastructure costs across more kWh sales.

ii. A key ratemaking component of enabling widespread TE should be to transition away from traditional non-coincident demand charges (NCDCs) that can constitute significant cost hurdles for customers wishing to install commercial, workplace, fleet, or DC Fast Charging. Alternatives include:

- Coincident demand charges that reflect the contribution to peak load or distribution capacity costs;
- NCDCs that are based on a load factor or utilization factor of the customers maximum potential instantaneous peak demand; or
- Demand-charge holidays with energy-only rates, or a dynamic rate that reflects time-dependent contribution to peak load or distribution capacity.

iii. <u>New Jersey should require that any EVSE deployed with the assistance of ratepayer dollars is "smart" -- i.e., can connect to a network, communicate with the utility or third-party aggregator, and respond to signals or commands that modulate charging rates and times in a way that benefits the grid</u>. This will prevent the stranding of ratepayer-funded assets, and ensure that EV charging can be fully integrated into the grid in a cost-effective manner.

These considerations aside, perhaps the biggest role the utilities can play is to use their relationships with customers for Marketing, Education, and Outreach (ME&O) purposes to promote the switch from gasoline to electric vehicles. At a minimum, utilities should host and promote a central landing page on their website that serves as a one-stop-shop for all things related to driving electric. Such websites should contain, at a minimum:

- An explanation of the benefits of driving an EV;
- A cost comparison calculator to show projected electric fueling costs for customers and overall savings of EVs versus ICE vehicles over the life of the vehicle;
- EV and EVSE purchase rebates and incentives;
- Utility infrastructure offerings;
- Rate options and smart charging program descriptions; and
- Approved EVSE vendors and links to EVSE web stores.

5. In light of the rapid technological developments underpinning the clean transportation space, it is critical that publicly-funded infrastructure is future-proofed to the maximum extent feasible to avoid stranded assets

Utility investments in "make-ready" infrastructure--conduit, wires, trenching, and other infrastructure required to bring electrical service to an EV charger--carry equivalent lifespans to other distribution assets and are largely future-proofed due to the lack of power electronics and networking elements. EVSE does contain such elements, although it is unclear the degree to which the basic form of function of EVSE will change over time. We reiterate that if all EVSE is required to be networked and able to receive firmware upgrades it will help prolong the life of the EVSE and optimally integrate EV charging load into the grid in response to ever-changing grid conditions. Further requiring EVSE to operate using communication standards and protocols will help guarantee the extended usefulness of public infrastructure. Ultimately, EVSE can be easily switched out at the connection point with make-ready, and by then any rebate will have done its job at the time of initial dispersal to encourage fuel switching.

6. Transportation electrification will entail significant new electric demand that may require new generation resources and may increase distribution system costs if not integrated in a thoughtful, proactive manner

In the early years, it is likely that charging demand will appear to the grid in relatively concentrated geographic areas, due to fleet, transit, and overnight residential charging. As stated above, utility-managed smart EV charging programs can help ensure that distribution equipment and the local transmission grid are not strained in areas with high EV adoption. Smart charging programs can spread charging evenly across the distribution system within the off-peak TOU period to ensure that transformers are not overloaded and have adequate time to cool off. Smart charging can also guarantee that new electric demand from EVs is used to integrate New Jersey's clean energy buildout, by programming charging to coincide with the availability of intermittent renewable energy, including wind and solar power generation.

7. New Jersey's clean transportation goals will impact the state's workforce in several ways

The state will see an uptick in demand for labor from licensed electricians to safely install distribution system extensions, make-ready infrastructure, and EVSE. The New Jersey BPU should consider a requirement for utilities to source electricians for TE-related infrastructure buildout that have completed the EV Infrastructure Training Program (EVITP) certification or similar credentialing.[19] TE will also intersect with the traditional workforce in subtler ways. Many prominent retail outlets, including Walmart, Costco, and Home Depot, are already major resellers of EVSE, and sales staff must be trained in EV charging fundamentals such that they can help consumers make informed choices. Even salespeople at auto dealerships may not be adequately trained in the nuances of EVs relative to ICE vehicles. New Jersey can institute a dealership EV sales training program to ensure that consumers receive consistent messaging around the benefits of driving electric, EVSE installation, utility rate options, and the behavioral modifications needed for a smooth transition from ICE vehicles. Finally, property or facility managers at workplaces or commercial sites with employee or public charging need to be properly trained in charge port operation and maintenance.

[19] For more information see https://evitp.org/

8. It is critical for New Jersey to guarantee that residents of disproportionately impacted communities have access to clean transportation options and realize the benefits of TE investments

Disproportionately impacted communities can be characterized by median income level or pollution burden. TE investment programs should include budget carve outs and/or performance incentives for deploying EV charging infrastructure and clean vehicles within both of these categories.

Areas with high pollution burdens due to proximity to highways, ports, or industrial areas realize direct benefits from TE in the form of improved air quality. New Jersey can pursue these outcomes by adopting utility programs that invest in fleet charging infrastructure for vehicles that operate in high pollution areas, such as heavy-duty freight, delivery trucks, and buses, and by creating a state rebate for medium- and heavy-duty EV purchases. The state can also effectuate air quality improvements in areas adjacent to high-polluting highways by creating high-occupancy vehicle (HOV) lanes and piloting congestion pricing schemes in those areas, and then granting EV drivers access to HOV lanes and exempting them from congestion prices.

Regarding low- to moderate-income (LMI) customers, utility EV investment programs and associated marketing efforts can specifically target deployment of charging infrastructure at residences and public sites within LMI communities. New Jersey can also provide EV purchase rebates to LMI customers above the levels available to the general public.

VI. Conclusion

Enel appreciates this opportunity to deliver comments. We look forward to participating in the 2019 Energy Master Plan working group process. Please do not hesitate to reach out to us.

Respectfully submitted,

/s/ Brian Kauffman

Manager, Regulatory Affairs, Enel X North America

One Marina Park Drive, Suite 400

Boston, MA 02210

brian.kauffman@enel.com

610-368-3010

/s/ Katie Guerry

Vice President, Regulatory Affairs, Enel X North America

One Marina Park Drive, Suite 400

Boston, MA 02210

Katie.Guerry@enel.com

/s/ Kate McKeever

Director, Regulatory Affairs, Enel Green Power North America

100 Brickstone Square Suite 300

Andover, MA 01810

Kate.McKeever@enel.com

/s/ Jinjue Allen

Associate General Counsel, Legal, Enel Green Power North America

100 Brickstone Square Suite 300

Andover, MA 01810

Jinjue.Allen@enel.com

/s/ Marc Monbouquette

Senior Manager, eMotorWerks, Inc.

846 Bransten Road

San Carlos, CA 94070

marc.monbouquette@emotorwerks.com

/s/ Petr Guryev

Enel Global Thermal Generation

petr.guryev@enel.com

/s/ Sam Brandin

Business Development Associate, Enel Green Power North America

100 Brickstone Square Suite 300

Andover, MA 01810

Sam.Brandin@enel.com