



Senate Consumer Protection and Professional Licensure Committee
Public Hearing on Solar Energy in Pennsylvania
Testimony of Joel M. Harrington, Enel North America, Inc.
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Good morning Chairman Stefano and Chairman Boscola, and distinguished members of the Senate Consumer Protection and Professional Licensure Committee, thank you for the opportunity to speak today on utility scale solar development in the Commonwealth of Pennsylvania.

My name is Joel Harrington, I am the Director of Public Policy & Institutional Affairs for the Eastern U.S. Region for Enel North America, Inc. I am here today to testify on behalf of the Mid-Atlantic Renewable Energy Coalition (MAREC). Our company, Enel North America, is a member of MAREC and I sit on MAREC's board of directors.

The Enel Group, which celebrated its 60th anniversary in 2022, is a multinational power company and a leading integrated player in the power and clean energy markets. At a global level, Enel is the largest private owner of renewables, network operator by number of end users, retail supplier by customer base, and demand response provider by aggregate capacity.

Enel is present in 30 countries worldwide, providing energy to approximately 70 million homes and businesses with over 90 gigawatts ("GW") of total capacity. In North America, Enel has a presence across 18 US states and one Canadian province, Enel North America is a leading developer, long-term owner and operator of renewable energy plants in North America. The company operates 80 plants with a managed capacity of over 9 GW powered by renewable wind, geothermal and solar energy including 76 MW of energy storage capacity and 160,000 electric vehicle charging stations. We're also developing and constructing a large portfolio of hybrid projects that pair solar power generation with utility-scale battery energy storage. Our projects have generated over \$200 million in lease payments to landowners and \$90 million in new property tax revenue in the U.S. since 2016. We have invested more than \$11 billion in the U.S. and Canada since 2000.

Another business line that is active in Pennsylvania is Enel X North America, that provides distributed and customer-sited services and technologies, including demand response, distributed battery energy storage and electric vehicle charging and services. Enel, directly and through its subsidiaries, serves over 4,500 businesses, utilities, and cities through renewable power generation, demand response, DERs, smart electric



mobility solutions, energy trading and advisory services. PJM is our largest footprint in North America for Enel X.

Enel's Presence in Pennsylvania

Enel has operated in Pennsylvania for more than a decade and has employees who live and work in the Commonwealth. You may be familiar with our demand response programs where we currently have 484 MW enrolled for some of Pennsylvania's largest commercial and industrial customers, generating ~\$19 million in payments that go back to those customers. Four of our Pennsylvania utility-scale solar projects are slated to come online by the end of 2024, each are paired with a 19.9MW battery storage system.

About the Mid-Atlantic Renewable Energy Coalition (MAREC)

MAREC Action is a nonprofit organization that was formed to help advance opportunities for renewable energy development in Pennsylvania and the broader region where the PJM Regional Transmission Organization (RTO) operates. MAREC members include utility-scale wind and solar energy developers, wind turbine and PV solar panel manufacturers, and affiliated organizations. Many of MAREC's members have developed or are developing projects in Pennsylvania.

Benefits of Utility Scale Solar to Pennsylvania Consumers

The renewable energy industry has already invested approximately \$3 billion in the Commonwealth, these projects provide approximately \$11.4 million in annual payments to farmers and other landowners in the Commonwealth.

Some of these benefits include:

Cost – Effective: Solar power is not only cost-competitive with conventional electric generation—it eliminates fluctuating fuel and transportation cost risks.

Reliable: Solar photovoltaic systems demonstrate high availability levels and provide reliable power during peak electrical demand periods.

Creates Grid Diversification and Energy Security: Solar power provides additional diversification to the nation's electric generation mix and increases stability and security of the electric grid.

Produces Positive Economic Impacts: Solar power electric generation contributes to the economic revitalization of local communities through increases to the local tax base, which creates an influx of new funding to local schools, and dollars for landowners and the local community during the construction process.



Utility Scale Solar and PJM Capacity Market

PJM is the grid operator for 13 states and D.C. PJM is technology and fuel neutral. Its job is to maintain a reliable transmission grid at the lowest reasonable cost.

PJM is uniquely large and geographically diverse. It spans two time zones, varying load patterns, and different areas rich in solar and other clean energy technologies. The geographic diversity and architecture of PJM makes it easy to reliably and inexpensively integrate clean energy resources, since energy and load variability in one part of PJM is offset by a different kind of variability in another area.¹

What is a Capacity Market?

Capacity represents a commitment of resources to deliver when needed, particularly in case of a grid emergency. A shopping mall, for example, builds enough parking spaces to be filled at its busiest time – Black Friday. The spaces are there when needed, but they may not be used all year round. Capacity, as it relates to electricity, means there are adequate resources on the grid to ensure that the demand for electricity can be met at peak periods and at all times.²

In PJM's case, that means that a utility, or other electricity supplier, is required to have the resources to meet its customers' demand plus a reserve. Suppliers can meet that requirement with generating capacity they own, with capacity they purchase from others under contract, through demand response – in which end-use customers reduce their usage in exchange for payment – or with capacity obtained through PJM capacity-market auctions.³

The Capacity Market ensures long-term grid reliability by securing the appropriate amount of power supply resources needed to meet predicted energy demand on a three-year-forward basis. Resources receive a payment for being available to meet peak electricity demand. Capacity market payments cover some or all of the fixed costs of building and maintaining generating resources.⁴

Under the “pay-for-performance” model, resources must deliver on demand during system emergencies or owe a significant payment for non-performance. Think of this like an insurance policy – the cost of reserving capacity to be available to the grid when needed and will perform as directed by PJM--consumers will have greater protection from power interruptions and price spikes during weather extremes.⁵

¹ *Growth of Solar on PJM's Horizon*. PJM Inside Lines. August 2019.

² PJM Learning Center. Capacity Market. August 2021.

³ PJM Learning Center. Capacity Market. August 2021.

⁴ PJM Learning Center. Capacity Market. August 2021.

⁵ PJM Learning Center. Capacity Market. August 2021.



By matching power supply with future demand, PJM's capacity market creates long-term price signals to retain and attract needed investments to ensure adequate power supplies.

Utility scale solar participation in the capacity market accounts for - 10% of PJM's capacity mix, 89% is fossil fuel. Shifting peak is mitigated by pairing solar with storage and new tracking technologies. PA is very close to a lot of load in the competitive PJM market with many PA based companies, municipalities, and colleges/universities that are taking an increasingly active role in their electricity purchase decisions or wanting to invest in clean energy technologies.

Without energy diversity, it is like putting all your eggs in one basket and creates risk as supply prices and availability fluctuate.

Our Development Approach

Beyond the millions of dollars in tax revenue and lease payments our projects generate in rural communities across the US and Canada, we invest in opportunities to create shared value with our host communities. This includes areas such as civil infrastructure improvement, community well-being, recreation and cultural events, education, economic development, environmental conservation and resiliency.

KEY DEVELOPMENT STEPS:

Site Prospecting: Before groundwork begins, we conduct desktop research to find the best locations in specific markets. Selected sites have the right combination of being a high solar resource; flat, open ground; proximity to electrical infrastructure; environmental suitability; compatible land use and more.

Land Acquisition: We secure rights to develop our solar projects on a landowner's property through purchase options or long-term lease agreements that may run for 30-40 years. During the site development process and prior to construction, landowners receive annual lease payments so they can continue to own and operate their land without interruption.

Electrical Interconnection: We file with regional transmission system operators (RTOs) to inject power on the transmission grid. Then, we coordinate with the RTO and electric utility companies on engineering studies to determine how projects will work with the local transmission system. We identify costs for facilities required to accommodate the injection and delivery of wholesale power.

Detailed Assessment: Once a potential site is deemed viable, we conduct several environmental surveys and perform initial engineering and design of the solar array and



other subsystems. We also begin the process of obtaining all necessary federal, state, and local permits.

Power Marketing: Before construction, most solar power projects require a contract with utility companies or commercial/industrial customers to purchase the power from the project. Our experienced team markets and promotes our solar power projects to potential customers and secures long-term power purchase agreements (PPAs) or other contract structures.

Creating Shared Value With Communities: Enel is developing two utility-scale solar projects in York County with a combined capacity of over 120 megawatts of clean power. These projects are slated to come online in 2024 and will produce the equivalent amount of energy needed to power 23,000 U.S. households and avoid 170,000 tons of carbon dioxide emissions. Furthermore, we're pairing each project with a 20-megawatt battery system that will help smooth the supply of energy to the grid and support power reliability and resiliency for Pennsylvania consumers. York County stands to reap substantial economic benefits from solar power. Just one of our solar farms in development – the 60-megawatt Dover solar project – is projected to stimulate 339 jobs, \$21.6 million in labor income and \$55.1 million in local economic output for York County during its construction phase.

During its operational life, we're looking at an annual local impact of over half a million dollars in associated labor income and \$1.7 million in local economic output, along with 8 long-term jobs.

So when you extrapolate those figures across the many more potential solar projects that could be built in York County and beyond, you can see that this is a significant economic engine. And in an era when so much economic gain is being concentrated in big cities, this is a sector where the growth occurs almost exclusively in rural communities like those in York County.

Agrivoltaics: Enel has been a pioneer in the implementation of dual-use solar, an approach to solar development that yields benefits for both power generation and the local ecosystem. This includes practices like conservation grazing, planting native grasses and forbs, promoting bee populations with pollinator-friendly vegetation, and even crop production known as agrivoltaics.

Project Construction and O&M: Once a project is contracted, our construction team begins work on roads, fences, the solar array, and other subsystems. The project is then connected to the electric grid. Once constructed, the solar power facility will have full-time Enel Green Power staff to manage long-term operations and maintenance.

Project End-Of-Life: Once a solar power project has reached the contracted term expiration and is no longer deemed active, project decommissioning begins. The entire



solar array and other subsystems are dismantled, and the land is restored to its original condition.

The entire process can take anywhere from 18 to 24 months.

Conclusion

Thank you for providing me the opportunity to testify before you today with regards to the incorporation of solar into the PJM grid and the responsibilities of Enel and other solar developers with regards to ensuring the resiliency and reliability of local solar projects. At this time, I will avail myself to answer any questions the Committee may have with regards to my remarks.

Thank you,

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