Prepared Testimony of

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Introduction

Good morning, Chairman Barrar, Chairman Sainato, and members of the House Veterans Affairs & Emergency Preparedness Committee. I am Gladys Brown, Chairman of the Public Utility Commission (Commission or PUC), and I thank you for the opportunity to testify today regarding House Bill 1412.

Microgrids are a new and fluid concept and something that utilities, government agencies, private businesses and communities across the country are actively exploring – so today's discussion is very timely. The PUC continues to encourage innovation, especially involving matters that have potential benefits for our citizens and our state, including the exploration of microgrids.

Potential benefits of microgrid systems include:

- Increased resiliency during large-scale electric disruptions events (such as hurricanes, bulk power grid failures, or cyber and/or physical attacks to power grid assets),
- Peak load shaving and voltage smoothing, to enhance reliability,
- Increased integration of renewable and highly-efficient distributed energy resources (DER),
- Potential cost savings to consumers from the use of renewable and highly-efficient DER,
- And potential cost savings to utilities (and ultimately ratepayers) through avoidance of construction and upgrades of high-voltage transmission lines and substations.

Microgrids fall into three major categories:

- Utility-owned microgrids.
- Privately-owned microgrids.
- Hybrid microgrid projects.

An example of a successful utility-owned project was highlighted at a recent "Smart Grid" conference in California. It involves the town of Borrego Springs, California, which was supplied by a single transmission line running through the desert, vulnerable to lightning strikes and flash floods. Rather than build a new, parallel, transmission line, San Diego Gas & Electric built a microgrid for the town of 2,800 – improving historically poor reliability at a cost that was three or four

times cheaper. This improvement in reliability, at lower cost for ratepayers, is a compelling argument in favor of this type of project.

Privately-owned microgrids are another option being explored by many entities seeking enhanced resilience during long-term outages. Institutions, such as Princeton University in New Jersey, and other similar facilities, have the ability to operate independent from the traditional grid. Their systems range in size from traditional "back-up power" systems for hospitals, to more elaborate systems that also include solar and other renewable energy generation. In these cases, the projects benefit individual entities, and they have traditionally borne the costs of installing and operating the systems.

Hybrid microgrid projects combine the two previously mentioned system types – often using a key facility, which requires uninterrupted power for continued operation, along with utility distribution of excess generation in "normal" circumstances – which can help address broad-based reliability issues, such as peak demand and voltage regulation. An example of this type of project is the Marine Corps Air Station, in Yuma, Arizona. In these circumstances, the key facility benefits with enhanced resilience, but the broader utility customer base also receives a benefit in terms of improved grid reliability, and costs are divided.

The legislation, as it is currently written, only envisions utility-owned pilot microgrid projects – with an intended focus on resiliency. We would encourage you to also explore the potential reliability advantages for utility-owned micro-grids, given the example noted earlier, along with exploration of the potential benefits of hybrid/partnership projects, which may help enhance both reliability and resiliency.

Potential challenges as we move forward include:

- The ownership of the generation, and how that interacts with current PA statutes and regulations - including electric competition.
- What is the utility's "obligation to serve" customers within the microgrid, and does that obligation change if the microgrid is utility-owned or privately-owned?
- How to determine if emergency microgrid assets are "prudent, used and useful" in the context of traditional utility assets and rate base rate of return.

- Who decides where to place the microgrids and how are those placements not discriminatory to customers that reside outside of the mircogrid – especially if the costs are subsidized by all rate payers? Would this decision be made by the utility and/or the PUC, would it be better suited to discussion and planning with all key local, state and federal stakeholders?
- How would the generation services provided by the microgrid and DER be dispatched – and how would those costs and rates be assigned? When operating in "island mode" a microgrid can be considered to be a mini-ISO (independent system operator) or a distribution ISO. While PJM (the regional "grid" operator for Pennsylvania and many surrounding states) implements an ISO framework for the electric transmission and wholesale generation markets, no such framework currently exists at the local/distribution level to coordinate a utility-owned microgrid's dispatch and accounting functions.
- The proposed bill refers to both energy storage and microgrid pilot programs, though it is not clear what an energy storage pilot program encompasses. It would be beneficial to clarify the intention of energy storage pilots, including whether they would be stand-alone systems or a subset of and supportive of a microgrid pilot.
- Finally, it is important to note that microgrids are not a panacea for other grid resilience efforts. They face the same issues as any utility infrastructure during major storm events or physical/cyber attacks. Therefore, I recommend that any final legislation include language recognizing that any utility assets and infrastructure employed as part of the microgrid are subject to the security planning and readiness requirements under the Public Utility Code at Chapter 101, and that the utilities' pilots must demonstrate how the microgrids will be cyber and physically secure.

As I noted at the beginning of my testimony, there are a variety of potential benefits to microgrids, and this is a very timely discussion. As we move forward, I encourage you to consider legislation that encourages the exploration of different type of microgrids – each with their own potential – while also allowing the flexibility to address growing and evolving technology.

Thank you for the opportunity to testify today. The PUC is at your service, should you have any questions or require any further information.