



Testimony of

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**Hearing before the
House Environmental Resources and Energy Committee
on
Alternative Energy Portfolio Standards/HB 1467**

December 11, 2023

I. Introduction

Good Morning, Chairman Vitali, Chairman Causer and members of the committee. My name is David Althoff, and I am the Director of the Energy Programs Office (EPO) in the Pennsylvania Department of Environmental Protection (DEP). I would like to thank you for the opportunity to appear before you today to discuss Pennsylvania's Alternative Energy Portfolio Standards (AEPS) and House Bill 1467, the purpose of which is to amend the Alternative Energy Portfolio Standards Act to expand the AEPS Tier I requirement from 8% to 30% by 2030. This expansion includes specific targets for in-state grid-scale solar, community solar, and distributed generation solar and creates a path for community solar projects and low-income access to community solar in Pennsylvania.

II. Energy Program's Office's Role

The EPO at DEP has a mission to support energy policies and implement programs that incentivize clean energy generation, transport, and use. These programs prevent pollution, protect our environment, and improve public health—while increasing access to long term affordable energy resources for all Pennsylvanians. As such, EPO carries out various state and federally funded programs and activities for the benefit of the Commonwealth and in order to assist

DEP in its mission of protecting Pennsylvania's air, land, and water from pollution and providing for the health and safety of all Pennsylvanians through a cleaner environment.

The Energy Programs Office has been leading climate planning efforts and implementing the Pennsylvania Climate Change Act (Act 70 of 2008) requirements. These efforts include increasing our role in energy assurance resiliency planning; solar future planning; developing and disseminating clean energy workforce reports and assessments; supporting alternative energy transportation projects; and encouraging the further deployment of renewable energy. Together with our partners across multiple agencies, we support efforts that consider to the greatest degree energy efficiency across all sectors in Pennsylvania and we continuously prioritize and educate Pennsylvanians on the benefits of energy security, resiliency, and the value of energy conservation.

In addition to those duties, EPO also looks forward into the future by analyzing and exploring ways for Pennsylvania to benefit from recent and upcoming changes in the energy marketplace. From utilization of new alternative fuels and technologies in the transportation, industrial, and commercial sectors, to deployment of new energy efficiency products, and supporting microgrid development in areas of communities (termed resiliency hubs) via the use of distributed energy generation coupled with energy storage.

As we move forward, and maybe most importantly, we have an ever-greater emphasis on fairness and equity. In particular, we are focusing on the impacts of energy acquisition, delivery, and use on environmental justice communities. It is these communities that are overburdened by energy pollution resultant of past industries, which are enduring the impacts of a changing climate and have little financial resources to alter their path, no matter how much they may desire to do so.

We are keenly aware of the relationship between energy use and its impact on our environment and climate. Because we provide programmatic support in implementing the Pennsylvania Climate Change Act (Act 70 of 2008), we know per our 2020 Greenhouse Gas Inventory that over 89 percent of Pennsylvania greenhouse gas emissions comes from the production and use of energy. The continued deployment of alternative energy technologies that emit little or no greenhouse gas emissions and technologies that capture, remove, and use greenhouse gases for value-added purposes are critically important opportunities to achieving our greenhouse gas reduction goals.

III. Alternative Energy Portfolio Standard General Information

One of the important programs that EPO helps to oversee is Pennsylvania's Alternative Energy Portfolio Standards, which were created by the Alternative

Energy Portfolio Standards Act (Act 213 of 2004). This important program has helped spur economic development in Pennsylvania, grown the diversity of our energy mix, and contributed to the reduction of pollution via promotion of renewable and alternative energy technologies. Today, a majority of Pennsylvania's power comes from two sources, natural gas and nuclear energy, but the AEPS ensures that other sources of power generation are also present in our Commonwealth. That diversity of sources is a crucial safety measure, as it protects the resiliency of our grid during extreme weather and other adverse occurrences and it provides an array of options, allowing consumers to select the generation sources and prices that work best for them.

AEPS is administered by the Public Utility Commission (PUC) in cooperation with DEP and currently requires that 18 percent of electric power come from alternative and renewable sources. DEP and EPO play an important role in administering the AEPS. Act 213 directs that DEP ensure all qualified alternative energy sources meet all applicable environmental standards.

Throughout each reporting year, the Energy Programs Office works with the PUC and its Program Administrator to ascertain the compliance of qualified alternative energy sources or facilities to ensure they meet environmental standards. The Program Administrator reports directly to and operates under the direction of the PUC.

A foundational purpose of the AEPS Act was to provide economic development opportunities by increasing the mix of alternative energy supplying electricity generation to Pennsylvanians while keeping costs low through a regional marketplace. The AEPS Act required electric distribution companies (EDCs) and electric generation suppliers (EGSs) to include a percentage of electricity generated by alternative energy resources to their customers. That percentage increased each year until 2021. For each reporting period, the EDCs and EGSs are required to acquire and retire Alternative Energy Credits (AECs) in quantities equal to that percentage of their total retail sales of electricity in Pennsylvania to maintain compliance with AEPS. An AEC is created for every 1,000 kWh of electricity generated from a qualified alternative energy source. This activity of acquiring or purchasing of AECs – either via long-term contracts or on the spot market – both supports existing projects and encourages the entry into the marketplace of alternative energy systems.

The AEPS Act identified the fifteen (15) energy resources that are eligible for consideration in the program and, based upon their tier, the percentage of alternative energy resources that an EDC and an EGS must include. These resources are classified into two groups, Tier I and Tier II resources.

Tier - I 8%

- Solar

- Wind power
- Low-impact hydropower
- Geothermal energy
- Biologically derived Methane gas (Biogas)
- Fuel cells
- Biomass energy
- Solar thermal
- Alternative Energy Derived from the byproducts of the pulp and paper as well as the wood manufacturing process.
- Municipal and Co-Op Owned hydropower systems.

Tier II - 10%

- Waste coal
- Distributed generation systems
- Demand-side management –*Includes energy efficiency, demand response and use of industrial by-products and technologies such as waste heat.*
- Large-scale hydropower
- Municipal solid waste

Additionally, although solar photovoltaic is a Tier I resource, it has a standalone requirement within Tier I of 0.5%

Currently, and as of May 2021, the Tier I requirement is 8% of all retail sales, of which at least 0.5% of all retail sales comes from solar photovoltaic (PV) sources. This equates to 0.5% solar, plus 7.5% of Tier I resources equaling 8% of all retail sales from Tier I. Currently, and as of May 2021 the requirement for Tier II resources is 10% of all retail sales.

IV. Alterations to the AEPS

There were a few changes to AEPS along the way. I will quickly detail some of the most significant and recent changes as they may have relevancy to the changes currently under consideration

Act 129 of 2008 expanded the types of sources that qualify as Tier I alternative energy sources under the AEPS Act to include specific categories of low impact hydropower and biomass energy – specifically, Alternative Energy Derived from the byproducts of the pulp and paper as well as the wood manufacturing process. Act 129 also required the PUC to increase, at least quarterly, the percentage share of Tier I resources to be sold by EDCs and EGSs to reflect any new Tier I resources added as a result of this amendment.

Act 40 of 2017 modified the AEPS Act to only allow solar PV systems physically connected to a Pennsylvania EDC's transmission system and located within the Pennsylvania service territory to qualify to generate energy and Alternative Energy Credits eligible to be used by Pennsylvania EDCs and EGSs to

meet the solar PV share requirements. As a result, as of Compliance Year 2022, 92.8% of Tier I solar Renewable Energy Certificates (RECs) retired were provided via systems sited within Pennsylvania. Compare that to Non-Solar Tier I retired RECs: only 19% of those were provided via systems sited within Pennsylvania.¹

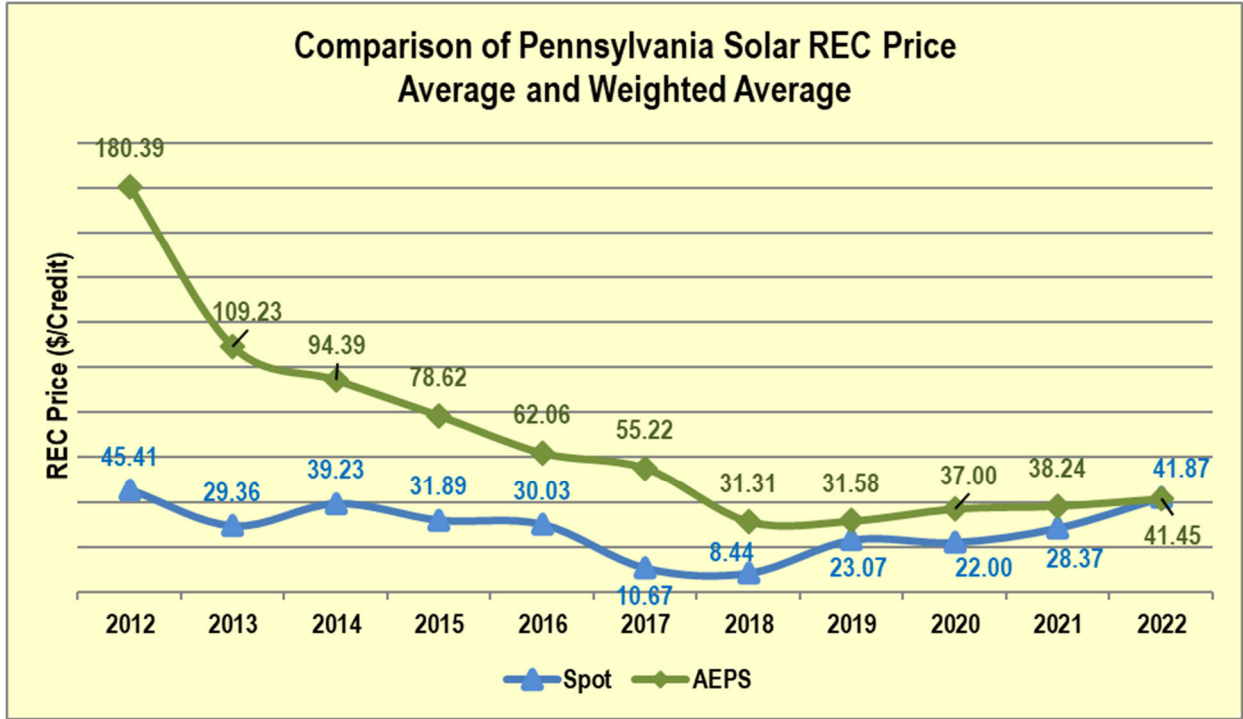
Act 114 of 2020 established geographical limits on alternative energy resources that qualify as Tier II resources under the AEPS Act. A final implementation order was issued by the PUC on May 6, 2021. As of the 2022 Compliance Year annual report, already 64.7% of Tier II retired RECs were provided via Pennsylvania-sited systems.²

These changes, particularly Act 40 and Act 114, prompted similar general effects on increasing REC prices but differing effects relative to the percentage increase. The geographical limitation of solar has resulted in a steady price increase since 2018; an AEPS weighted average per credit in 2018 was \$31.31 and had climbed to \$41.45 price in 2022.

Credit 2022 AEPS Annual Report.

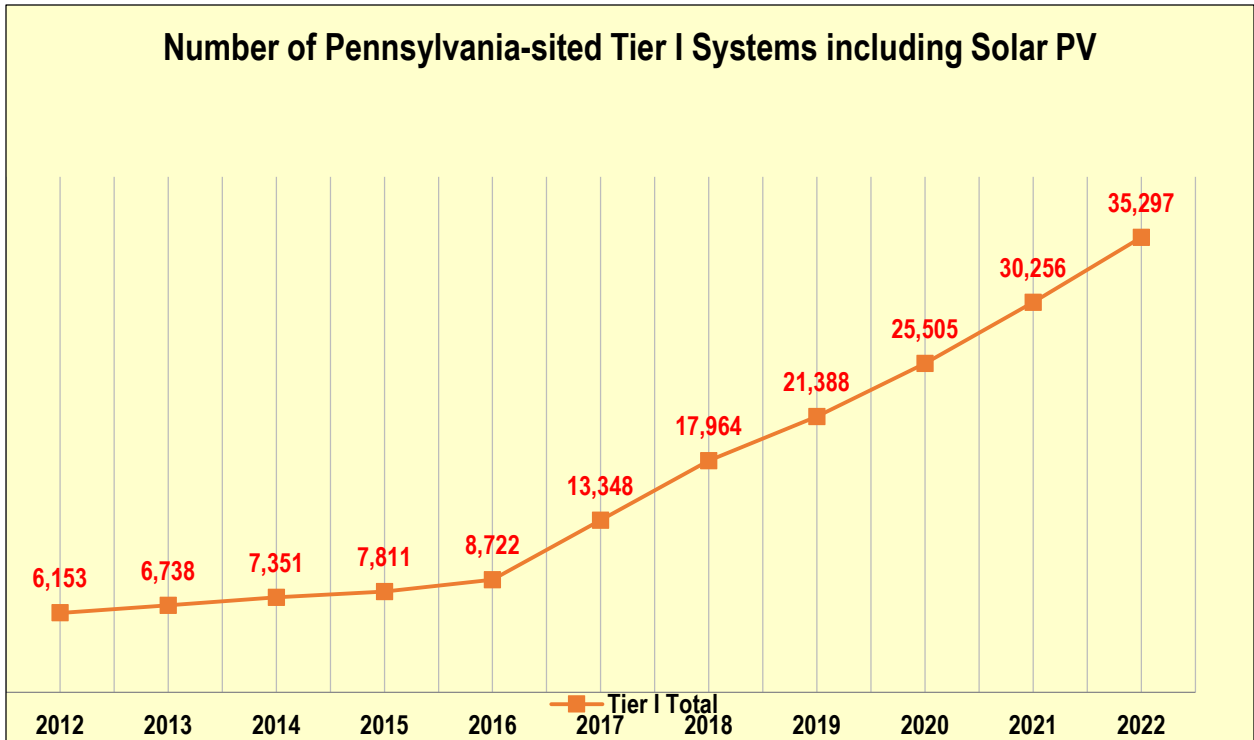
¹ AEPS 2022 Annual Report page 4 puc.pa.gov/media/2332/aeps-2022-report-final-032223-dm.pdf

² AEPS 2022 Annual Report page 4 puc.pa.gov/media/2332/aeps-2022-report-final-032223-dm.pdf



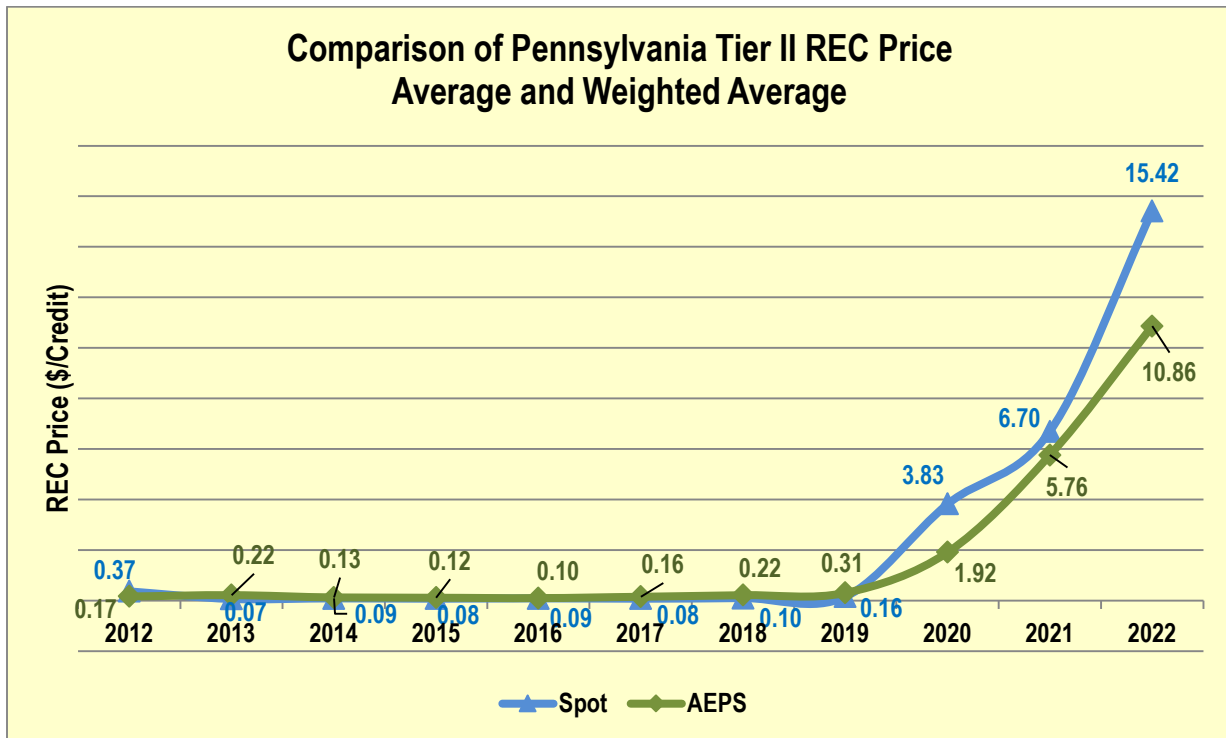
This could be due to the increase in number of systems responding.

Credit 2022 AEPS Annual Report.



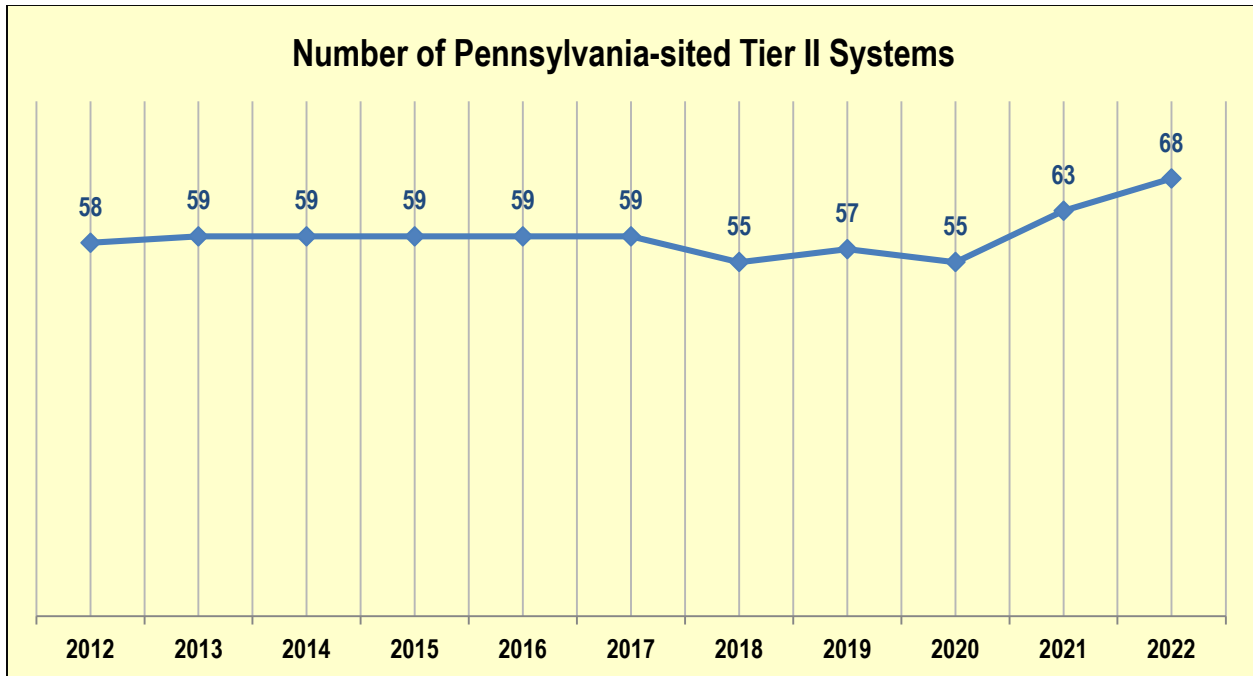
The change in Tier II had a more dramatic effect due to less opportunity to increase supply. In 2019, prior to Act 114, Tier II RECs AEPS weighted average per credit was 31 cents, in 2020 \$1.92 cents, in 2022, \$10.86, we are anticipating an average price for energy year 2023 to be around \$19.00.

Credit 2022 AEPS Annual Report.



This could be due to the number of systems responding:

Credit 2022 AEPS Annual Report.



V. Looking Backwards to Look Forward

Today we can say that the AEPS was successful at achieving its 18 percent goal of all retail sales being provided by Tier I and Tier II resources by the envisioned goal of May 2021. This outcome was uncertain and maybe even doubted when the policy was first debated. The past 17 years have now proved that the market will respond, and Pennsylvania can increase its percentage of alternative energy via legislative mandate—even with geographical limitations.

For example, let’s look at the current scope and scale of grid-scale solar development in Pennsylvania.³

³ Please note that “Grid-Scale Solar” does not include residences or businesses in the Commonwealth that generate alternative energy for onsite consumption.

- There is currently approximately 306 megawatts (MW) installed capacity from twelve operating projects.
- We have just recently surpassed 1 gigawatt (GW) of installed solar capacity in Pennsylvania that has been certified by our AEPS administrator.
- There is approximately 17 GW of capacity in development from roughly 440 projects that are currently seeking approval from the transmission operator, PJM, to connect to the grid.⁴ *Of these 440 projects, 120 have received an interconnection agreement from PJM to sell electricity into the grid and are at different phases of the design, permitting, and construction process.*
- There are over 500 MW of grid scale projects identified as “under construction” in the PJM Queue.
- These 440 projects in development represent over \$19 billion⁵ in investment potential (to build and operate) and an estimated 55,000 jobs over 10 years.⁶

⁴ PJM Interconnect: Services Request Status Database <https://www.pjm.com/planning/service-requests/services-request-status> Data accessed 11 July 2023.

⁵ NREL: \$1.161 per W_{dc} for 100-MW_{dc} one-axis-tracking PV system (modeled market price, 2023) Source: U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks, With Minimum Sustainable Price Analysis: Q1 2023, Figure 13 <https://www.nrel.gov/docs/fy23osti/87303.pdf>

⁶ Solar Foundation: 3.3 Installation and Project Development Jobs per MW Installed (Utility-scale) Source: 2018 Solar Census, Table 9, Page 30 <https://www.thesolarfoundation.org/wp-content/uploads/2020/02/Solar-Jobs-Census-2018-1-1.pdf>

Pennsylvania, again, needs to craft a forward-looking energy policy—and in shaping that policy we can learn from the lessons of past energy policy. The AEPS Annual Reports developed by the PUC with input from DEP detail the compliance status of the program, the costs and benefits of alternative energy generation, the status of the Alternative Energy Marketplace, and *provide recommendations for improvement*. The 2022 AEPS Annual Report recommended the following improvements:

- a. Consider increasing the percentages of electricity consumption from alternative energy resources:

Neighboring states took notice of Pennsylvania’s forward-looking policy and have surpassed us. And while Pennsylvania was completing its 15-year path to 18 %, New York, Maryland, Delaware, New Jersey, and Virginia implemented portfolio standards with much higher percentages luring developers and jobs, and building energy generation sources to reduce the amount of energy they import from states like Pennsylvania. Over time, this trend will continue and accelerate, reducing the demand for all forms of Pennsylvania electricity exports, if we do not act to update the AEPS.

For example:

- New York 70% renewable electricity by 2030 and 100% carbon-free electricity by 2040.
- New Jersey 50% Class I renewable energy by 2030
- Maryland: Renewable Portfolio Standard; 50% by 2030; Tier I solar requirement @ 14.5%
- Delaware: Renewable Portfolio Standard; 40% by 2035 with a 10% solar carve out by 2035
- Virginia: Renewable Portfolio Standard; 100% by 2050.

b. Community Solar:

In addition to updating the AEPS, another important change that will enable us to catch up to neighboring states in electrical generation build out. That is enabling community solar as a way to provide Pennsylvanians with greater access to local sources of electricity without needing to rely on large-scale infrastructure or to pay for construct an energy system at their home or on their property. There are different ways this program can be structured, but the 2022 AEPS annual report recommended that community solar should be structured in a manner that does not allow costs to be shared or subsidized by non-participants and should avoid providing excess compensation to developers for installing equipment that is already required under current interconnection practices (*e.g.*, smart inverters).

c. Mitigate the risks and value the flexibility and potential for energy storage.

In addition to AEPS reform and Community Solar authorization, we can work to improve the diversity and resiliency of our electrical grid by introducing the use and preference of available and soon-to-be-available storage technologies combined with intermittent resources such as solar and wind. Combining solar with behind-the-meter battery backup can mitigate impacts relative to supply and demand ramping on the distribution system, particularly on circuits with higher concentrations of solar electricity generating systems. Pooling the storage capacities of electric vehicles, smart appliances, and HVAC systems and allowing them to operate and respond en-mass via smart wireless technology can create a swarm response and a wireless approach to system development that can blunt the peaks associated with grid-stress events. Response tools and assets distributed throughout every community on every street will have the ability to voluntarily assist with load balancing much in the same way as large industrial users do today.

VI. Conclusion

In closing, it is imperative that the General Assembly act to keep Pennsylvania competitive in the regional electrical generation marketplace. As we approach the twentieth anniversary of the pathbreaking AEPS legislation, there is a growing need to reform and update its standards to ensure that Pennsylvania has

access to a plentiful supply of different sources of reliable power. As Governor Shapiro has made clear, we are proud to be an all-of-the-above energy state. The AEPS ensures that we are true to that description and that *all* sources of power have an opportunity to thrive here. This matters because Pennsylvania does best when we are not overly reliant on a single form of generation. That was the reason for the original AEPS in 2004 and now is the time to build on its success and to go farther. Finally, the market is ready and historic opportunities available through the federal Inflation Reduction Act will help to build and develop clean energy projects in our communities and re-establish Pennsylvania as a diverse energy leader.

Thank you again for the invitation to testify today. I appreciate your calling this hearing to focus on this important topic today. The Shapiro Administration looks forward to working with the General Assembly and all interested stakeholders on this topic as we seek to both conserve and improve our electrical generation marketplace.