



Pennsylvania Public Utility Commission

Ms. Rosemary Chiavetta, Secretary

Commonwealth Keystone Building, 2nd Floor, Room N-201

Harrisburg, Pennsylvania 17120

February 3, 2018

PUC Docket Number: M-2017-2631527

Dear Secretary Chiavetta,

Please accept the following formal comments regarding M-2017-2631527:

For many years, Pennsylvania ratepayers have enjoyed the inherent benefits of distributed solar energy. But because of a broken incentive system (the open border AEPS program), the people who receive the financial incentive are separated from the people who are have provided the benefit.

As part of my research at The Pennsylvania State University, I have analyzed years of hourly solar generation and hourly day-ahead electric prices (day ahead LMP) across the state. Others have researched and established the benefits of distributed energy as far as transmission and distribution are concerned. My work focuses on the market suppression that occurs when suppliers bid for generation in the day

ahead market, which accounts for roughly half of the electric generation ultimately supplied to ratepayers. The results that I'll explain below are simply put that solar energy decreases the cost of electricity generation for ALL RATEPAYERS and an increase in solar generation will lead to even lower costs to all ratepayers. But in order for that to occur the solar energy generation must be reasonably close to the consumer to avoid transmission congestion. My data analysis assumes EDC-sited solar, but PA-sited is a close approximation.

Market suppression occurs because solar energy is highly predictable in the day-ahead market. Each day when PJM announces the predicted day-ahead demand for electricity, this demand prediction has already factored in an offset for the behind-the-meter solar production that will take place that day. Thus the required amount of generation that EGSs must obtain is lower than what they would have had to acquire if there was no solar production. Lower demand is inherently connected to lower price. Thus the settlement price for that day-ahead market is suppressed because of the presence of solar generation that is not bidding in the day-ahead market, but rather assumed to be automatically generated. This market suppression affects all of the energy bid that day resulting in savings to each and every consumer in Pennsylvania. I have attached a peer-reviewed publication with my analysis of this market suppression as part of my formal comments.

Numerically, my results show that for every 0.1% of solar RPS (when solar makes up 0.1% of all energy used within an EDC), energy providers will save 0.2% on the costs to obtain their energy on the day-ahead market. If roughly half of energy is

obtained on the day-ahead market, this would represent a 0.1% savings that would be passed onto ratepayers in a competitive market. There is currently enough solar in PA to meet a 0.2% solar RPS. However the target of the AEPS program is currently 0.3%. Thus due to the Pennsylvania AEPS program being open to other states, there is a 0.1% deficit in PA-sited solar and thus PA rate payers are missing out on what should be a 0.1% reduction in their electric supply costs. This 0.1% amounts to \$50 million statewide in unnecessary ratepayer costs due to the open-border rules that the AEPS program has used in the past.

One of the goals of the AEPS program should be for the person who creates these savings for the electric infrastructure to receive the financial benefits themselves. Thus because solar generators across the state are currently suppressing electric generation costs by about 0.2% (\$100 million), these solar generators should be receiving that \$100 million as an incentive. The SREC is a perfect vehicle for that incentive to be delivered to the solar generator from ratepayers who receive the benefit. Clearly solar generators receive payments for these SRECs. And it is without question that ratepayers ultimately pay for all SRECs with some EDCs, such as Penelec, including a line-item directly on the bill for this purpose. In the current market place, \$100 million divided up among all yearly SRECs is about \$200 per SREC.

If the AEPS program were limited to just in-state solar generators, then the 2021 goal of 0.5% solar RPS would represent a savings of about \$250 million to acquire all the energy for Pennsylvania consumers. If this is divided among the estimated

800,000 or so SRECs that would be required, one would expect an SREC cost to be about \$300.

Thus \$300 represents a reasonable target price for the value of an SREC. A price of \$300 per SREC will never happen with the open-border policy due to all the out-of-state SREC credits flooding the PA market. Furthermore, in-state solar energy in Pennsylvania will never reach the 0.5% RPS level without a more robust SREC incentive. Due to the open border policy, what IS happening is the following:

- 1) PA ratepayers are paying incentives to out-of-state solar generators to reduce the rates of out-of-state ratepayers.
- 2) Out-of-state ratepayers reap the rewards of low rates without paying for the incentives that made those low rates possible.
- 3) In-state solar generators are not being adequately incentivized for their contributions to keeping PA electric rates low.
- 4) Out-of-state solar generators, most notably those in North Carolina, are double-dipping in incentive programs being eligible to receive NC-based incentives as well as PA-based incentives....no wonder North Carolina has such a robust solar market.

All of this represents a drain on the Pennsylvania economy and essentially a situation in which PA ratepayers subsidize out-of-state ratepayers. **This is a situation that the Pennsylvania PUC should swiftly rectify by closing the borders and creating a robust SREC market.**

It must be noted that my research also analyzed what would happen with a solar

RPS of much more than just 0.5%. The savings to electric suppliers due to increased solar continued to increase all the way up to a solar penetration of 5% (with no ill-effects) and even 10% (with some noticeable ill-effects). At 10%, my analysis indicates potential problems with capacity ramp-up, capacity ramp-down, and so called 'duck-curve' base-load shedding that occurs with a 10% solar RPS. This level of solar penetration will not occur for many years which gives the PUC and lawmakers time to address the ultimate need for another incentive program to be coupled with the SREC program. Pennsylvania needs a program that not only incentivizes solar generation, but also the creation of large scale energy storage capable of handling the issues that will develop when solar penetration reaches 10% and higher.

The comments expressed here are the views of the author and not necessarily the views of The Pennsylvania State University.

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