

Prepared Testimony of
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before the

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Good morning Chairman Yaw, Chairman Santarsiero, and members of the Senate Environmental Resources and Energy Committee. I am Gladys Brown Dutrieuille, Chairman of the Public Utility Commission (Commission).

The Commission thanks you for this opportunity to present testimony on the Commonwealth's participation in the Regional Greenhouse Gas Initiative (RGGI). At the outset, the Commission notes that it is not submitting this testimony to advocate for or against the Commonwealth's pursuit to join RGGI. Specific to this issue, as an economic, safety, and quality of service regulator; and not an environmental regulator, we intend to facilitate the objective conveyance of any data, information, or insight which may be sought by the Department of Environmental Protection (DEP), the Legislature, and the Governor as the RGGI rulemaking proceeds.

With this testimony, I will convey a background on Pennsylvania's electric generation marketplace, highlight some key components of the RGGI market design, detail some unique facets of Pennsylvania's proposed incorporation into this market, provide some simple cost projections for various categories of electric generation facilities, and posit on how these costs may affect industry participants.

The Commonwealth is host to a diversified electric generation fleet. As of the end of 2018 this fleet was comprised of the resources listed below on a megawatt (MW) installed capacity basis. I note that installed capacity represents the nameplate ability of these resources to generate power, not their actual power production.

- Natural Gas: 15,195 MW
- Coal: 12,634 MW
- Nuclear: 9,801 MW
- Oil: 4,170 MW
- Hydro: 2,413 MW
- Wind: 1,329 MW
- Solar: 295 MW
- Waste: 252 MW

While reviewing installed capacity is insightful, it is also valuable to review the actual production of various generation categories in the Commonwealth. For the year 2018 the total output of Pennsylvania generators was comprised of the portions detailed below.

- Nuclear: 40.0%
- Natural Gas: 29.6%
- Coal: 20.7%

- Hydro: 3.0%
- Wind: 1.7%
- Remaining resources such as solar, oil, waste, and batteries: 5.0%

In aggregate, Pennsylvania generators produced approximately 202.5 million megawatt hours (MWh) of electric energy during the 2018 calendar year. Approximately 24% of this electricity production was exported out of the state.

Like any marketplace, the generation landscape is subject to evolution. Recent trends in the Pennsylvania marketplace, and similarly the PJM Interconnection LLC (PJM) market as a whole, show a targeted investment in four resource categories: natural gas, solar, wind, and storage. As the PJM and Pennsylvania wholesale electric markets evolve so do market design, operational procedures, regulations, and state policies. Case in point, the Commonwealth's pursuit to join RGGI.

Governor Wolf signed Executive Order 2019-07 (Executive Order) on October 3, 2019 directing DEP to promulgate regulations, pursuant to the Air Pollution Control Act (APCA), to establish a carbon budget consistent with RGGI. The Executive Order also directs DEP to work with the Commission to ensure integration into RGGI "in a manner that preserves orderly and competitive economic dispatch within PJM and minimizes emissions leakage." Since that time, the Commission has been actively studying the RGGI design, reviewing documentation coming from PJM's Carbon Pricing Senior Task Force (CPSTF), and engaging with DEP.

RGGI is presently comprised of ten states, including all of New England, New York, New Jersey, Delaware, and Maryland. Similar to Pennsylvania, the Commonwealth of Virginia is also exploring efforts to join the regional compact. In summary, RGGI is a voluntary marketplace designed to facilitate the valuation and exchange of carbon dioxide (CO₂) allowances in order to foster reductions in carbon dioxide emissions from the electric generation sector. For each ton of carbon dioxide emitted by an "affected" electricity generating unit, one CO₂ allowance must be retired. The price of allowances is set via quarterly auctions and via other secondary markets. States have the option to participate in the regional auction or to conduct their own state-specific auction.

DEP's proposed regulation, as communicated to the Air Quality Technical Advisory Committee on February 13th, 2020 and May 7, 2020, would exempt all electric generating units with a nameplate capacity less than 25 MW. The Commission notes that this will effectively exempt all net-metered utility accounts

with permitted emissions. The proposal also exempts electric generators at manufacturing facilities with nameplate capacity ratings equal to or greater than 25 MW if the electricity production is used to ‘self-serve’ a majority of the manufacturers’ electrical demand. Further, the proposed regulation would exempt, or hold-harmless, existing waste coal facilities by annually ‘setting aside’ the number of CO₂ allowances equal to the total calendar year 2018 CO₂ emissions of Pennsylvania’s waste coal units. Finally the proposal establishes an initial CO₂ budget of 78 million tons commencing in 2022 and declining each year thereafter. The Commission understands that this CO₂ budget would need to be ratified by the other RGGI states if Pennsylvania were to become a RGGI member. To that end, it is important to note that this is a budget allowance, not a cap; facilities are able to buy and sell allowances across state boundaries within the RGGI region.

The proposed regulation adopts the RGGI Model Rule price controls. While the price of allowances is set via auction, the RGGI Model Rule includes a floor price, or emissions containment reserve (ECR) trigger price, and ceiling price, or cost containment reserve (CCR) trigger price, which DEP would manage by augmenting the supply of CO₂ allowances in the RGGI marketplace. The ECR trigger price and CCR trigger price for 2021 are set to be \$6.42 and \$13.91 respectively. These figures would increase each year by 7%, which again, is consistent with the RGGI Model Rule.

In an effort to inform the Committee, the Commission offers a dollar per MWh range of projected costs for Pennsylvania generators by resource class. These projected ranges are based on the 2019 emissions and production data as published by the Environmental Protection Agency’s Clean Air Markets Program Data for Pennsylvania generators, and, the RGGI published ECR trigger price and CCR trigger price for 2021. While these minimum and maximum figures are informative, it is unlikely that allowance auctions clear at either of these extremes. The Commission emphasizes that these are projections designed for informational purposes.

Approximate Range of \$/MWh Costs for 2021 RGGI Compliance - PA Electric Generators			
	Minimum	Maximum	Mid-Point
Combined Cycle Natural Gas	\$2.50	\$6.00	\$4.25
Simple Cycle Natural Gas	\$4.00	\$9.00	\$6.50
Coal	\$5.50	\$12.00	\$8.75
Fuel Oil	\$7.00	\$15.00	\$11.00

As the table above describes, the cost to a generator for RGGI compliance is directly correlated to the carbon intensity of the generator's fuel used in electricity production and the overall efficiency of electric generating technology. As such, the values indicate a higher cost of compliance for coal plants when compared to combined cycle natural gas plants. Therefore, the effect of the Commonwealth's joining RGGI would appear to be more profound on coal generators than others. The Commission does wish to note that fuel oil resources are predominantly peaking units, i.e. 'price-setters' during brief periods of high demand and consequently high locational marginal prices (LMP). Therefore, while these units' compliance costs are higher than natural gas units, their limited run-time and unique dispatch profile may, at least partially, insulate them from RGGI cost impacts.

The Commission posits that these additional costs would likely serve to accelerate the Pennsylvania electric generation marketplace transformation toward the four resources referenced earlier in this testimony: natural gas, solar, wind, and storage. Additionally, any potential increase in overall LMP, and diminution of coal generated supply, attributed to RGGI would likely bolster the operations of Pennsylvania's existing nuclear generation facilities, as these units are essentially 'price-takers' as opposed to 'price-setters.'

Finally, the Commission notes that it is monitoring and reviewing the issue of leakage via PJM's Carbon Price Senior Task Force (CPSTF). Leakage is the potential increase in out-of-state generation, at the expense of in-state generation – and the consequent change in CO₂ emissions – in response to higher wholesale electricity bid prices of RGGI compliance units within a carbon-controlled zone. On February 27th, 2020 PJM shared preliminary results of a RGGI modeling scenario in which Virginia and Pennsylvania both joined. Assuming no leakage-mitigation mechanism is in place, the modeling predicts that joining RGGI would reduce carbon emissions and overall generation in the five PJM RGGI states, with an increase in emissions and generation in the rest of PJM. Net CO₂ emissions throughout PJM would be reduced. As well, this model exhibited an overall increase in LMP across the PJM zone. This increase in PJM energy prices, however, would be partially offset by decreases in both capacity and Alternative Energy Credit prices. Moving ahead we intend to continue educating ourselves in this regard and look forward to further discussions with DEP and PJM on this subject should DEP consider using any leakage mitigation tools or designs.

In closing, it is our hope that this testimony helps facilitate a better understanding of the Commonwealth's pursuit to join RGGI and some of its potential

benefits and impacts. Specific to this issue, we emphasize our role as economic, safety, and quality of service regulators and how this role does not include environmental regulation. Nonetheless, we are fully cognizant of the nexus that environmental regulations have with the Commission's jurisdiction. The Commission is happy to work with this Committee, the General Assembly as a whole, and the Governor's Office to facilitate any further analysis or considerations related to this important subject matter.