PA RGGI 2025 Simulation Results

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MC Information Webinar

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Study Request

- The simulation was at the request of Pennsylvania Senate Majority Leader Joe Pittman to conduct a study on the impact of the RGGI electricity tax—outlined in 25 Pa. Code Ch. 145 Subch E—on wholesale electricity prices in Pennsylvania.
- The PA RGGI 2025 Simulation Results can be located at https://www.pjm.com/-/media/DotCom/library/reports-notices/special-reports/2025/20250425-pa-rggi-2025-simulation-results.pdf

Simulation Procedure Overview

Data & Assumptions

- PowerGEM's latest commercially available model data (May 2024)
- Transmission network topology utilized the MMWG 2024 Series planning case 2025 expectations
- Energy market simulated in isolation (no interchange or market impact from ISO/RTO neighbors)
- Generation Expansion (2025 expected new entry) consistent with latest planning assumptions

Procedure

- Utilized *PROBE LT tool* to simulate economic scheduling & dispatch for 2025
- Two 2025 simulations were performed to assess the impact of PA joining RGGI
  - Baseline - PA does not join RGGI
  - PA joins RGGI - RGGI adder applied to impacted PA units

Analysis

- The results of the two simulations were used to assess the impacts of PA joining RGGI on three key components

1. Prices
2. Production
3. Carbon Emissions

Simulation Summary

Simulation Parameters

- The simulation assumes Pennsylvania RGGI membership during PJM model year 2025.
- The simulation forecasts energy prices, generator emissions, and generation production in Pennsylvania and PJM as a whole.
- The simulation does not forecast RGGI impacts on the PJM capacity market or resource adequacy.

Wholesale Prices

- An increase in marginal production costs will raise spot market energy prices for consumers both within and outside Pennsylvania[1].
  - Under this simulation, Pennsylvania's annual load payments are projected to increase by 13%, or approximately $752 million.
  - Under this simulation, PJM's total annual load payments are projected to increase by 8%, or approximately $2.5 billion.

Retail Prices

- Retail price impacts will depend on various factors including auction schedules & what Pennsylvania chooses to do with RGGI revenues, and thus, retail price impacts were not modeled.

[1]These figures assume all load pays the marginal price, or LMP. In reality, a significant quantity of load is hedged against the marginal price through a combination of self-supply, bilateral contracting, financial hedges, etc.

Simulation Summary (continued)

Emissions

- Applying a RGGI-like cost to carbon emissions for Pennsylvania generators will result in lower total emissions in Pennsylvania due to reduction in unit output.
  - Under this simulation, Pennsylvania's annual CO_2 emissions decrease by 52%.
  - Total annual CO_2 emissions across the PJM footprint are projected to remain relatively flat.

Production

- Pennsylvania will remain a net exporter of electricity to other states within the PJM region.
- Under this simulation, Pennsylvania's net annual electricity exports are projected to decrease from 105.6 TWh to 38.3 TWh.
- Decreases in Pennsylvania net annual exports will be met by increases of generation by equivalent out-of-state fossil-fueled power plants.

Costs to Pennsylvania Generators / RGGI Revenue to Pennsylvania

- Under this simulation, CO_2 emissions costs to Pennsylvania generators/suppliers of $968 million would be remitted to the Commonwealth by RGGI, Inc.