



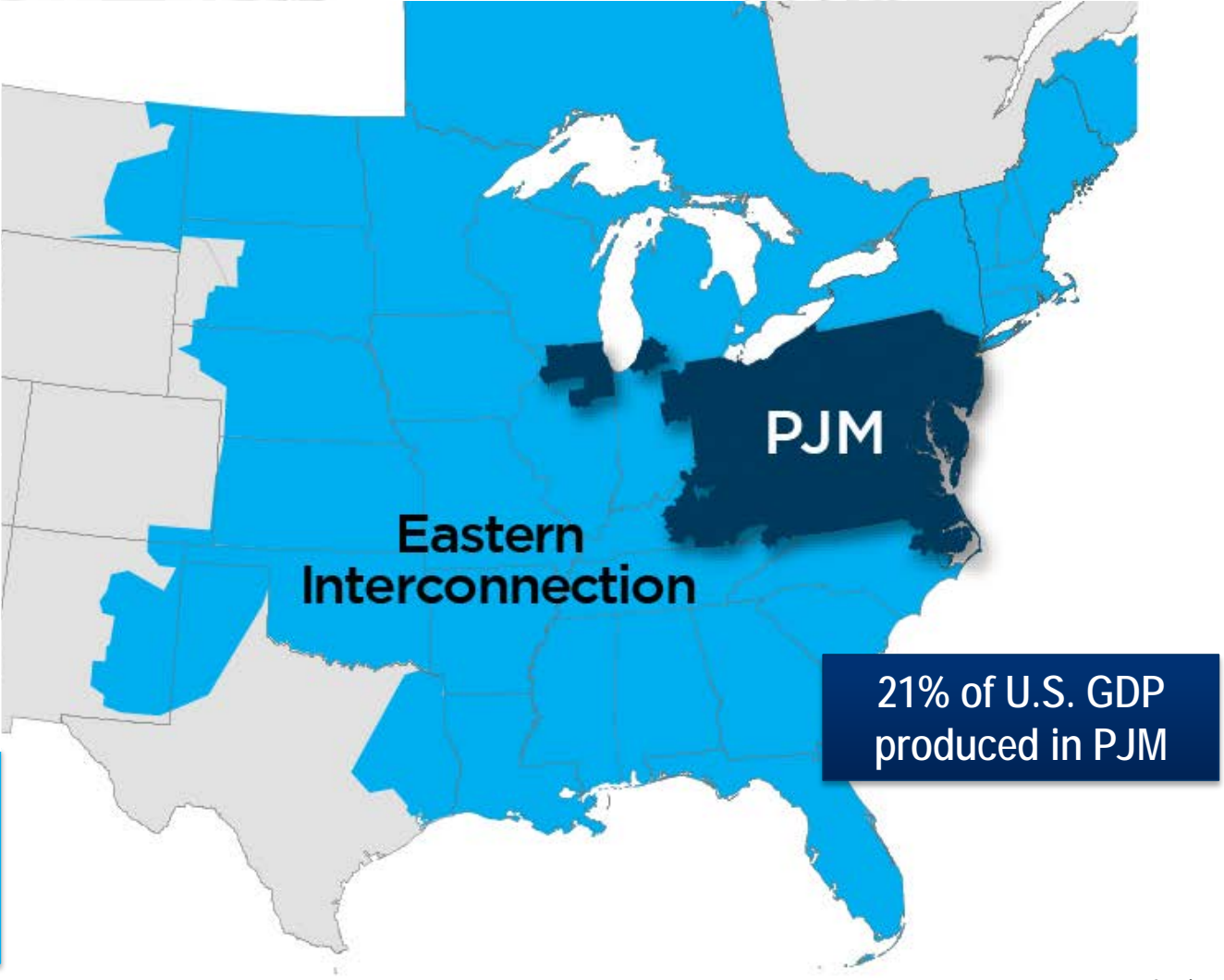
Carbon in PJM

M. Gary Helm
Lead Market Strategist

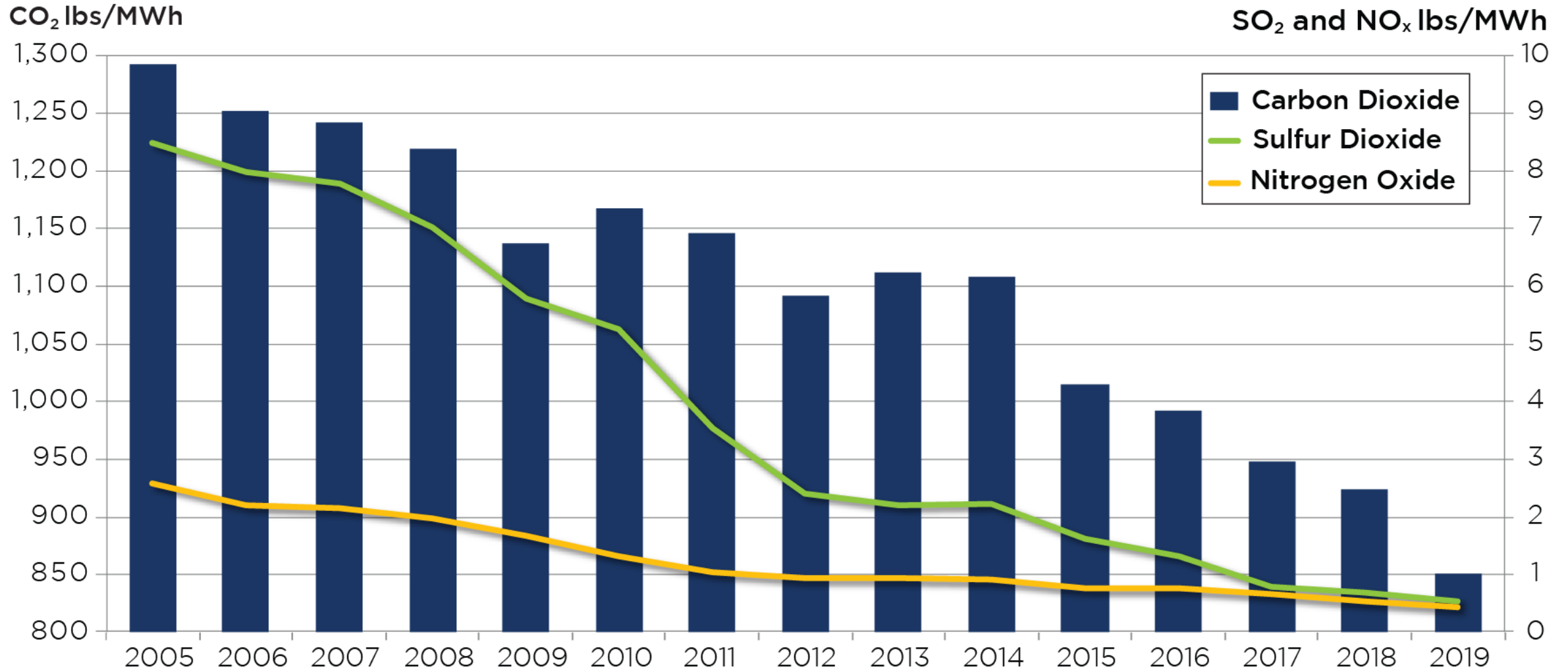
Key Statistics

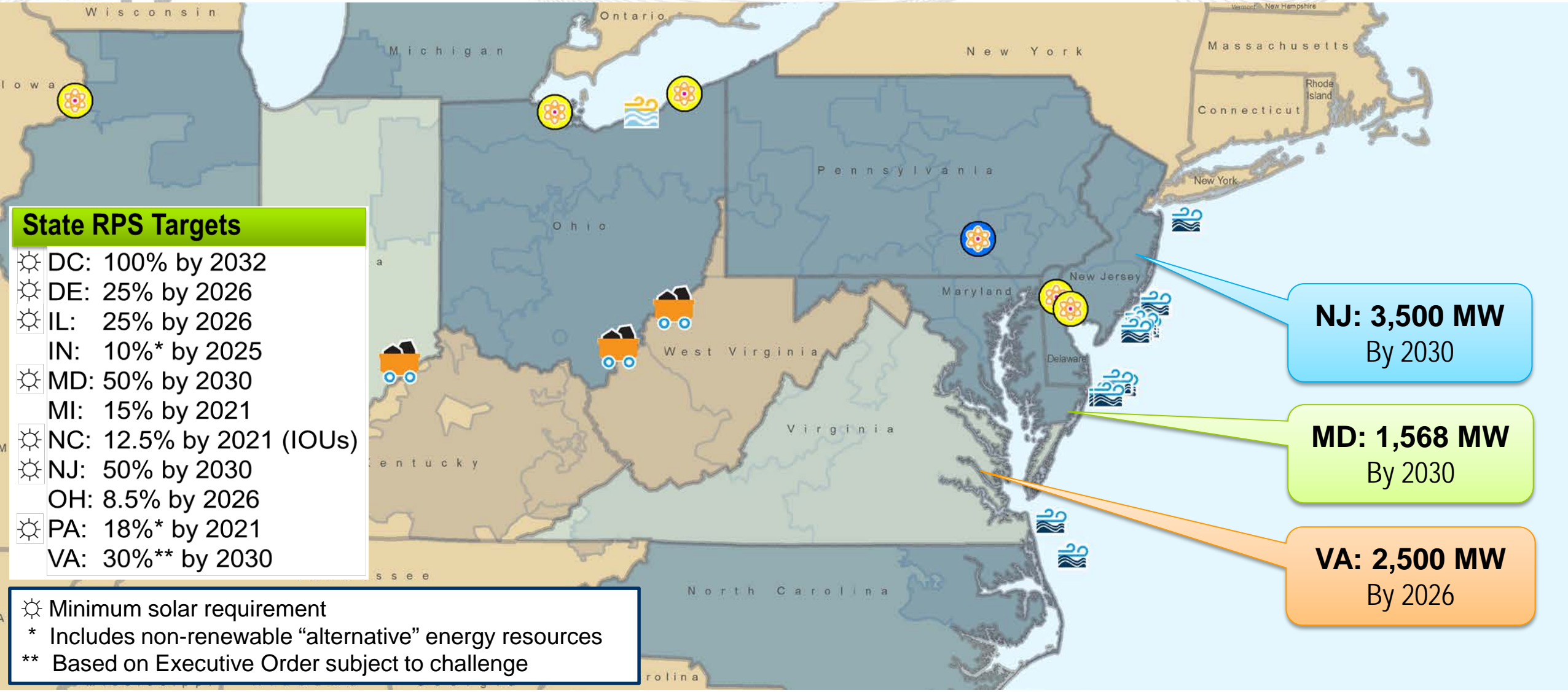
Member companies	1,040+
Millions of people served	65
Peak load in megawatts	165,563
MW of generating capacity	186,788
Miles of transmission lines	84,236
2018 GWh of annual energy	787,307
Generation sources	1,446
Square miles of territory	369,089
States served	13 + DC

- 27% of generation in Eastern Interconnection
- 26% of load in Eastern Interconnection
- 20% of transmission assets in Eastern Interconnection

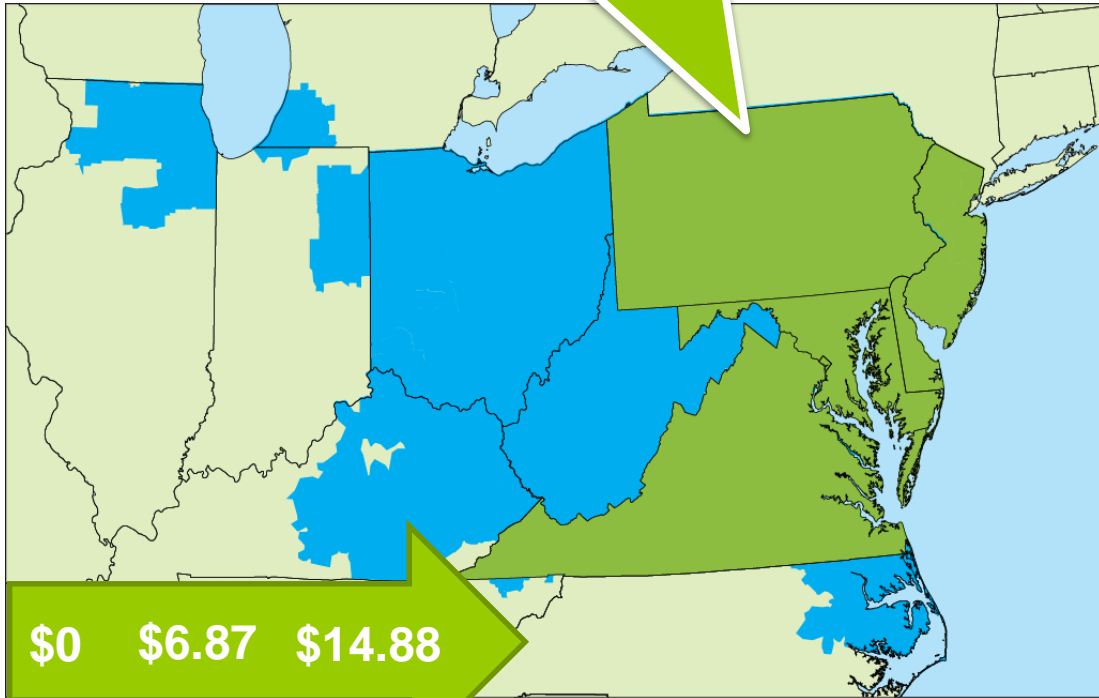


As of 1/2020





Carbon Region
DE, MD, NJ, VA, PA



\$0 \$6.87 \$14.88

Carbon Price

What It Is...



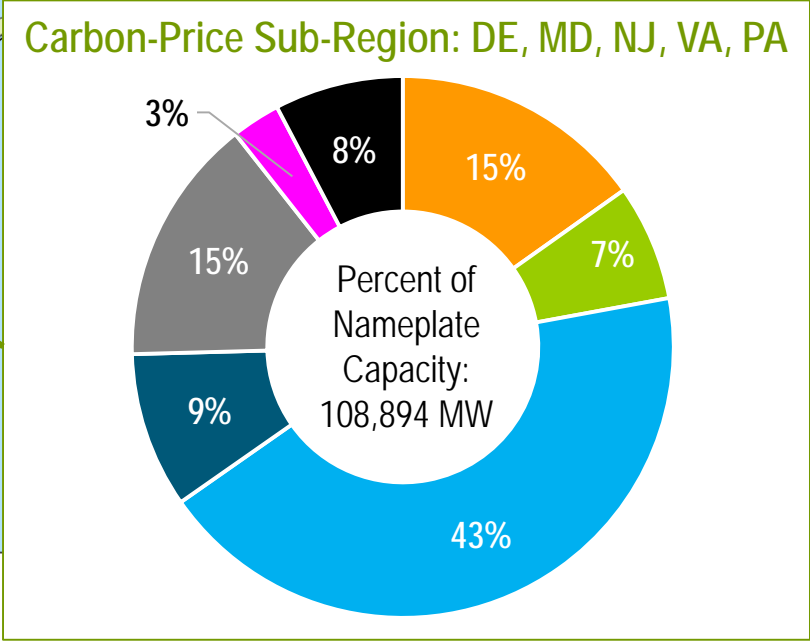
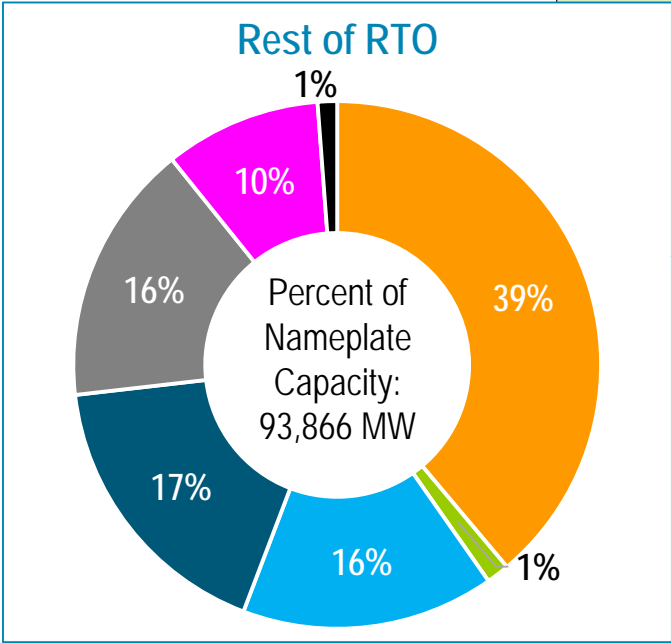
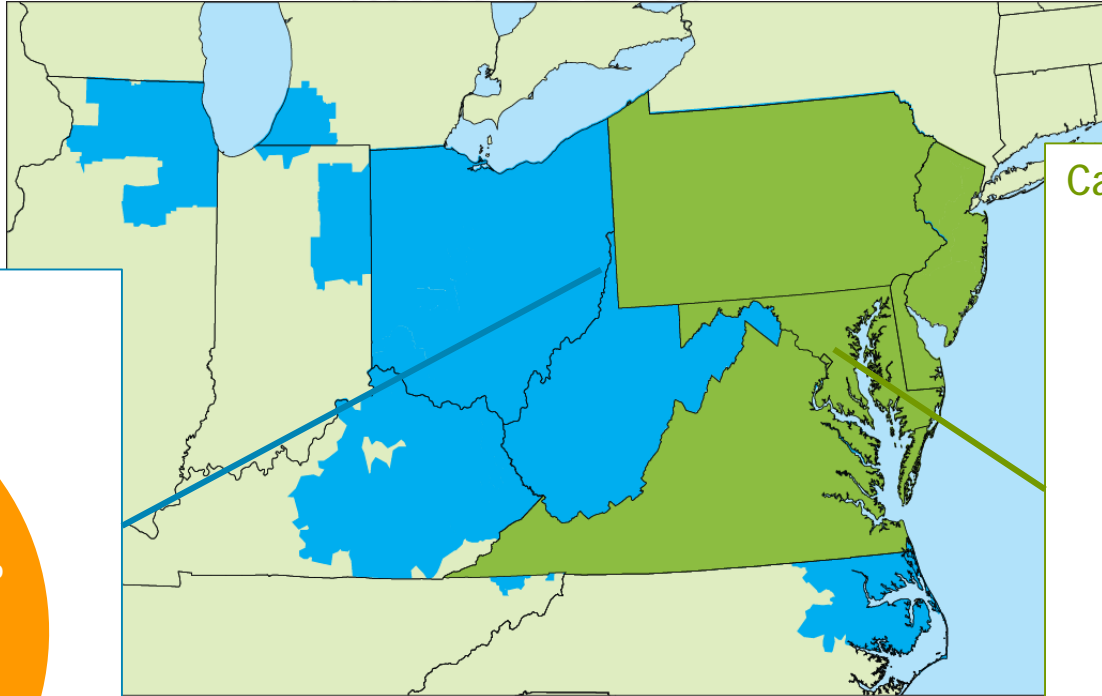
- Production-Cost Model
- Emission Leakage and Impact on Power Price
- Border Adjustment Impacts on Prices and Leakage

What It Is NOT...



- Macroeconomic
- State Policy
- PJM is **NOT** proposing to establish a carbon price or policy.

Results depend on the generation mix and emissions intensities of each sub-region.



- Coal
- Natural Gas CC / Steam
- Natural Gas CT
- Nuclear
- Hydro
- Wind & Solar
- Other

Modeling of Carbon Prices from RGGI

Compared to counterfactual with no carbon price

- Generation & Emissions
 - **Decrease** in carbon-price sub-region
 - **Increase** in rest of RTO
 - Net RTO impact varies based on sub-region assumptions
- Energy Prices
 - On average, LMPs **increase** in both sub-regions as the carbon price increases

Impacts of Border Adjustments

Compared to no border adjustment

- Generation & Emissions
 - **Increase** in carbon-price sub-region
 - **Decrease** in rest of RTO
 - Net RTO impact varies based on sub-region assumptions
- Energy Prices
 - On average, as the carbon price increases, a two-way border adjustment results in greater price **decreases** than a one-way border adjustment.