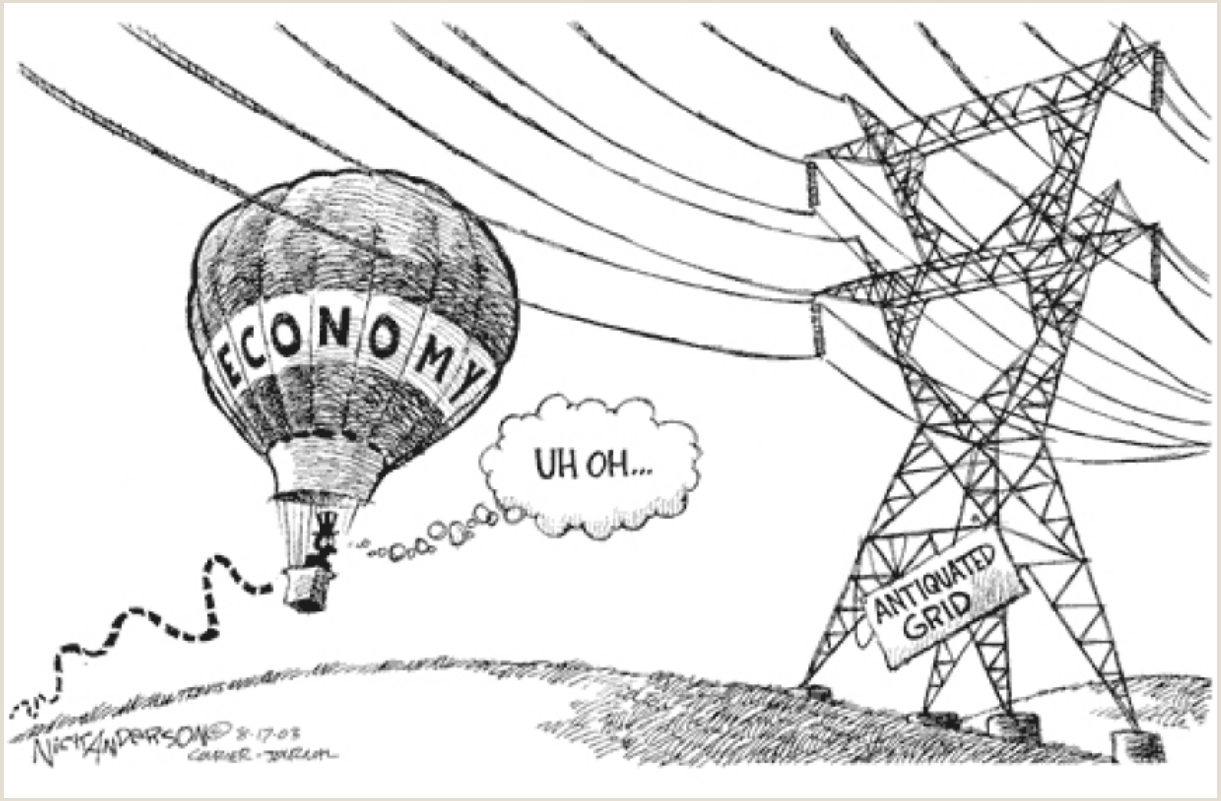
Federal and Regional Policy Drivers



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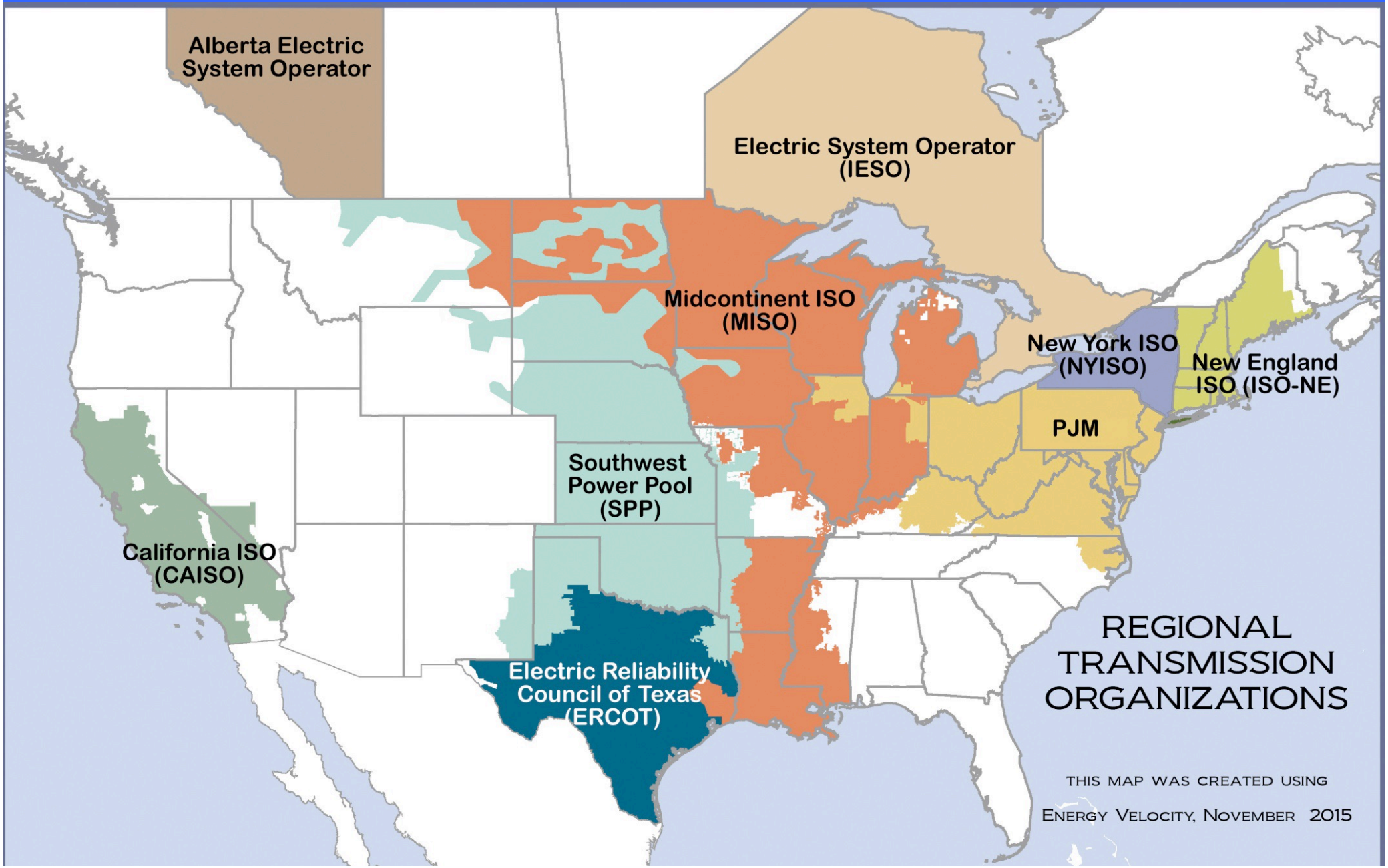
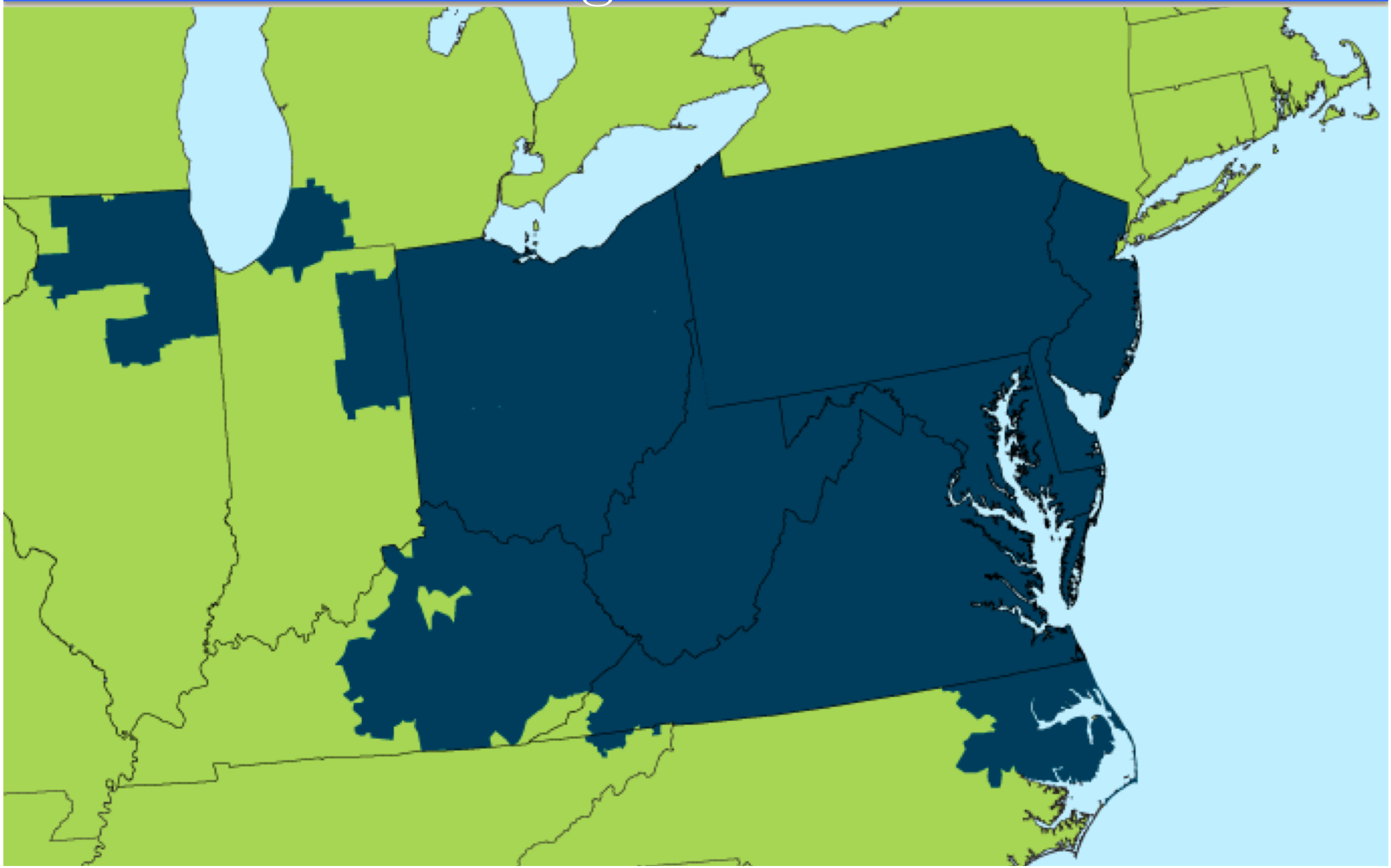
17 June 2021

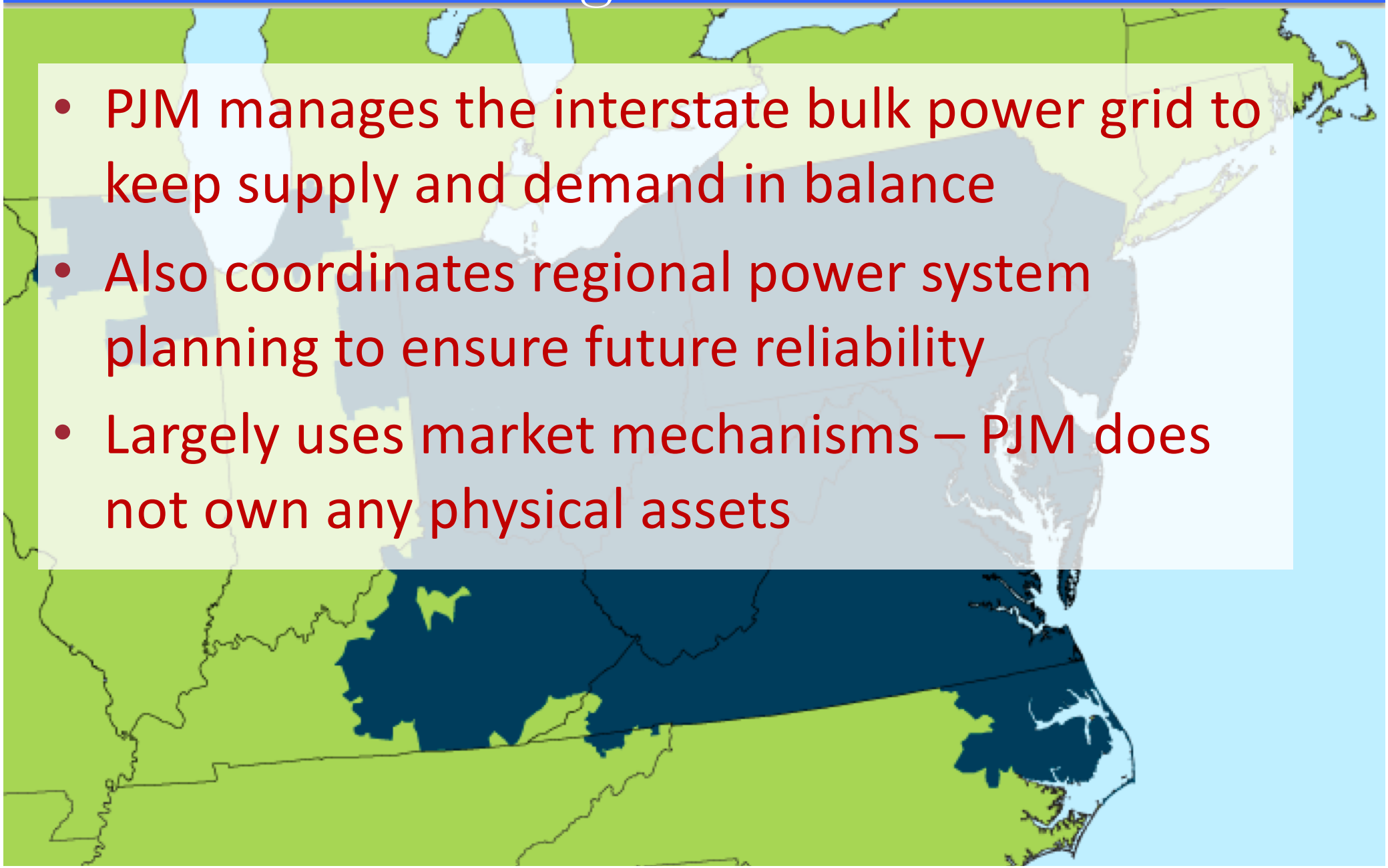
Pennsylvania is Part of a Regional Electric Grid



The PJM Regional Transmission Organization

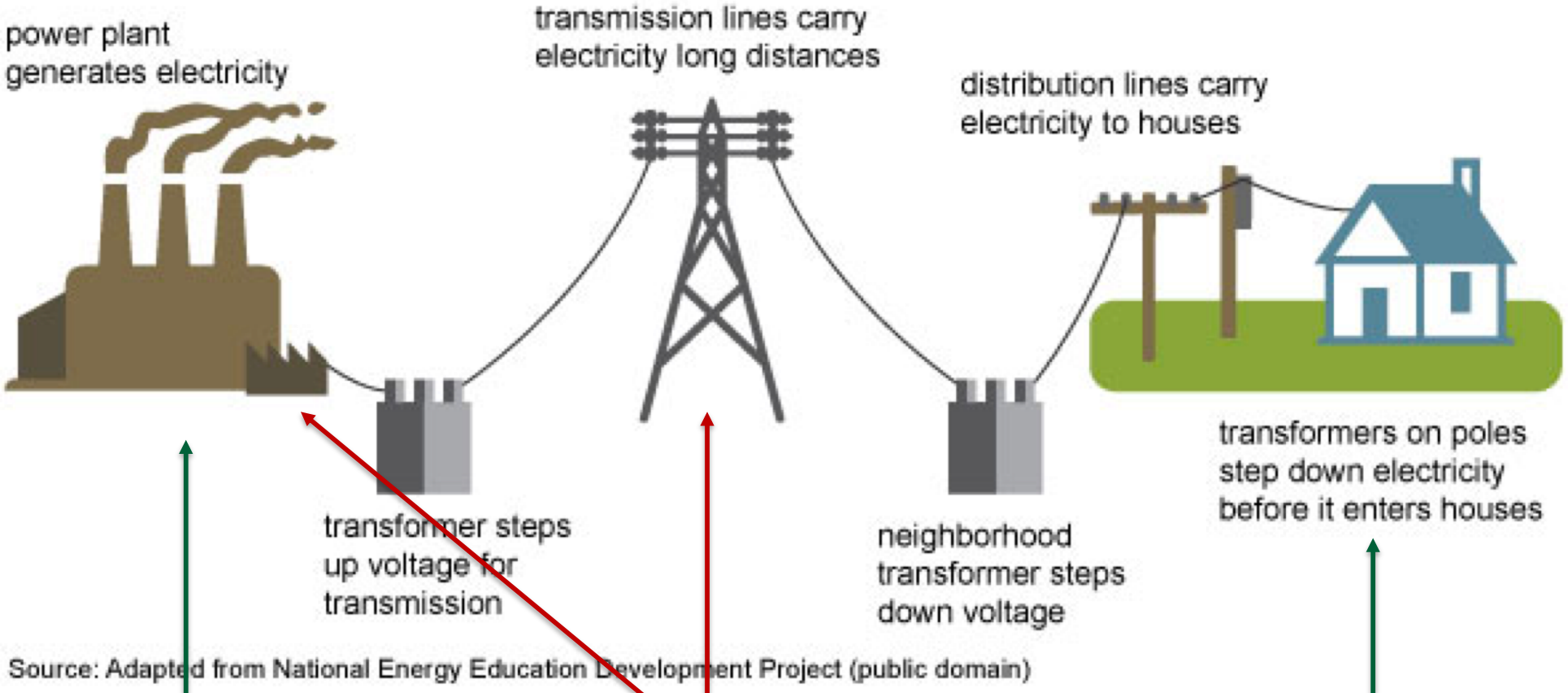


The PJM Regional Transmission Organization



- PJM manages the interstate bulk power grid to keep supply and demand in balance
- Also coordinates regional power system planning to ensure future reliability
- Largely uses market mechanisms – PJM does not own any physical assets

Electricity generation, transmission, and distribution



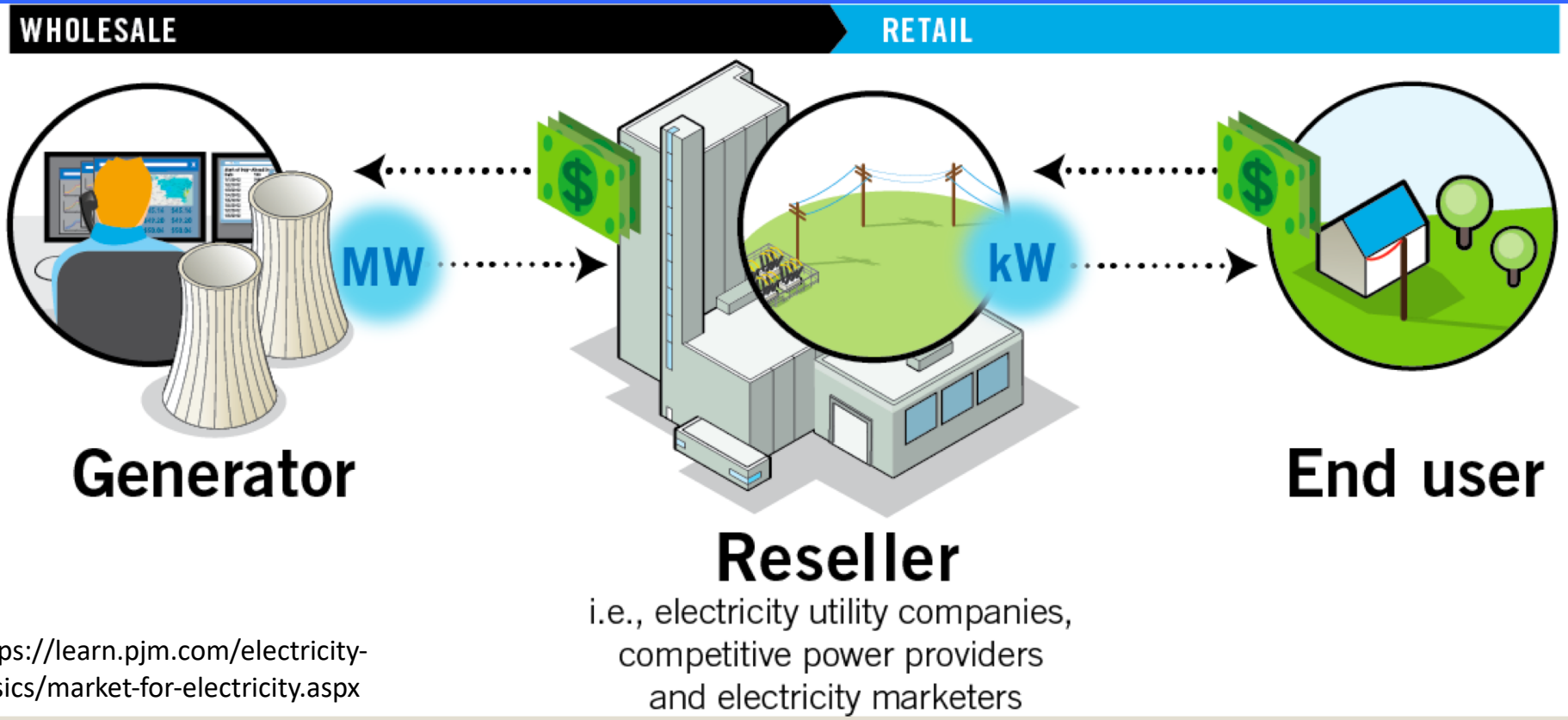
Source: Adapted from National Energy Education Development Project (public domain)

State Regulations Affecting Generation

Regional Grid Planning and Operation, Federal Regulation

Local Grid, State Regulation

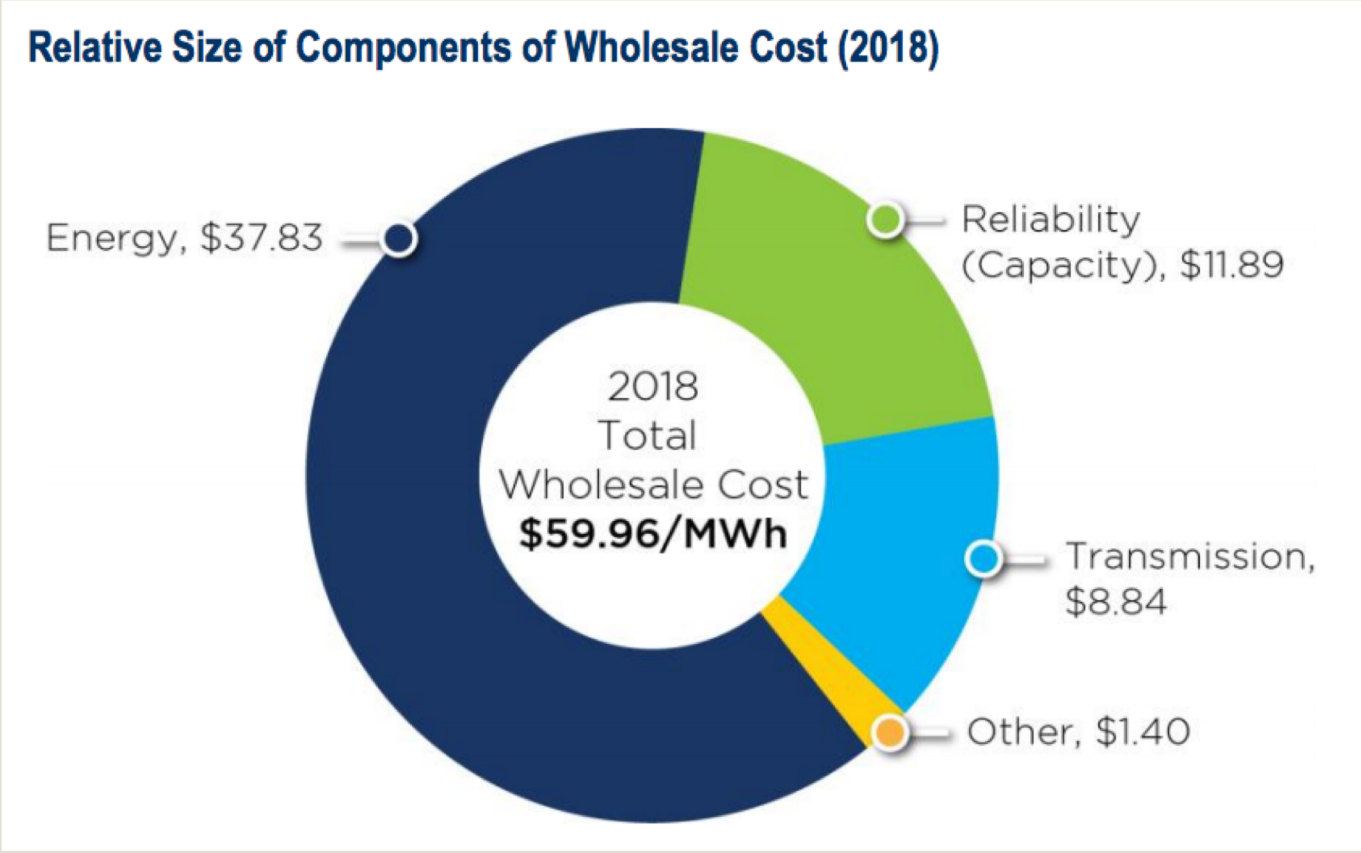
Wholesale vs Retail



https://learn.pjm.com/electricity-basics/market-for-electricity.aspx

- PJM's jurisdiction is only on the wholesale side of the market.
- State policy choices about generation can impact the wholesale market, which has caused some regulatory tension.

PJM Markets



https://learn.pjm.com/-/media/about-pjm/newsroom/fact-sheets/understanding-the-difference-between-pjms-markets-fact-sheet.ashx

PJM Energy Market

- **Function:** Secures electricity to meet consumer demand in real time and near-term
- **Includes:** Real-Time and Day-Ahead markets
- **Portion of wholesale electricity cost:** 63 percent (2018)

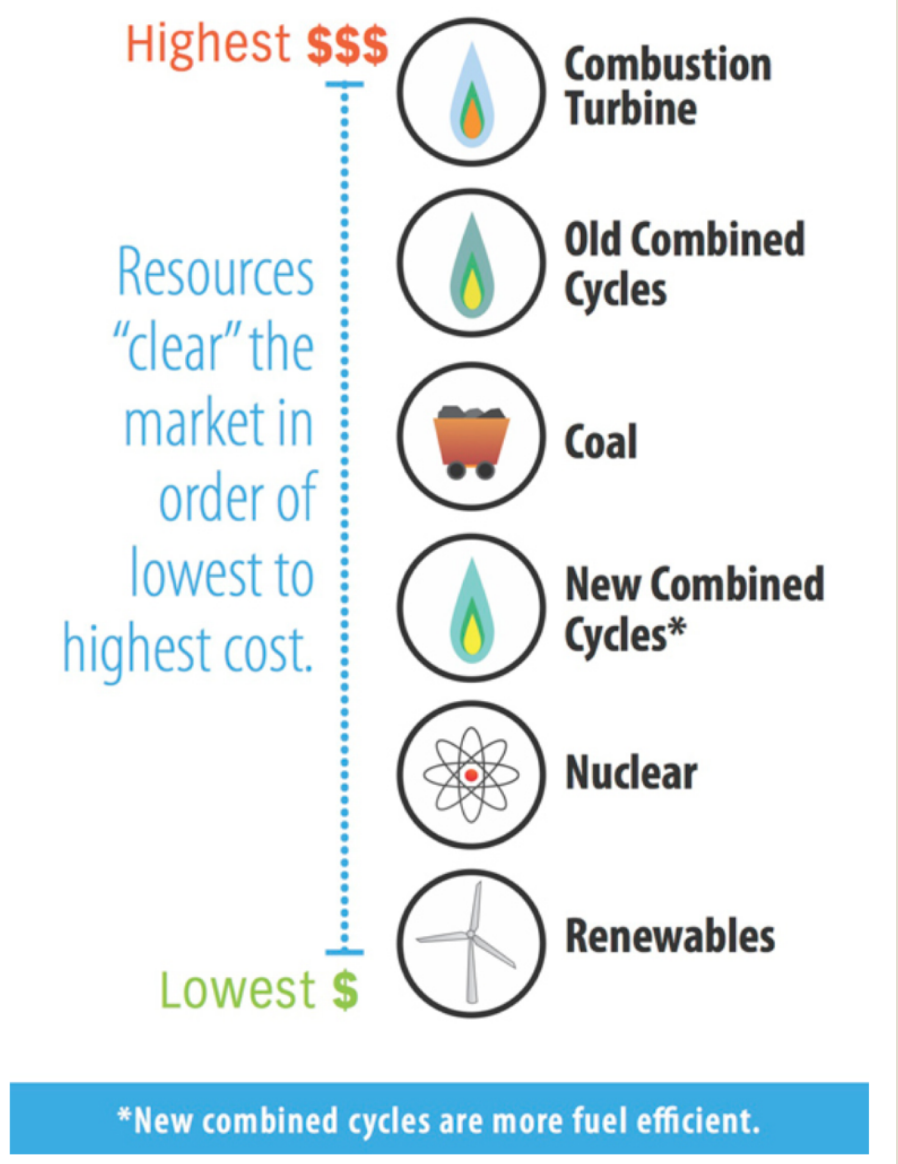
PJM Capacity Market

- **Function:** Ensures the future availability of power supplies three years in advance
- **Portion of wholesale electricity cost:** 20 percent (2018)

PJM Ancillary Services Markets

- **Function:** Helps balance the system as it moves electricity from generating resources to consumers
- **Includes:** Regulation, Reserve Markets
- **Portion of wholesale electricity price:** Less than 1 percent (2018)

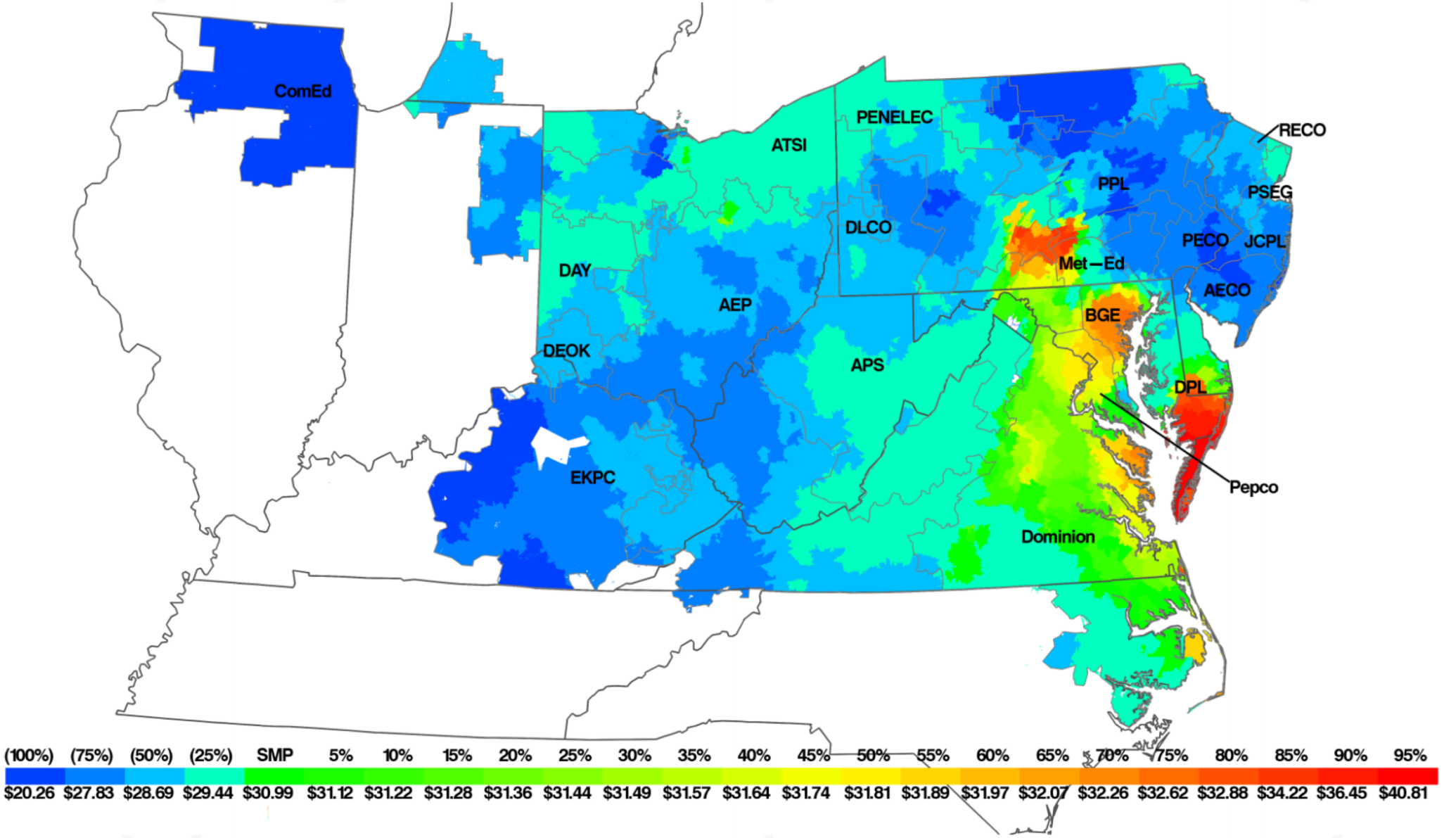
PJM Market Pricing



https://learn.pjm.com/electricity-basics/market-for-electricity.aspx

- PJM's markets are run as auctions, with a single "clearing price" determining which resources are dispatched.
- Lower cost resources will be dispatched more frequently.
- PJM calculates location-specific wholesale prices ("Locational Marginal Prices") in the energy market that reflect energy and transmission congestion costs.

PJM Market Pricing



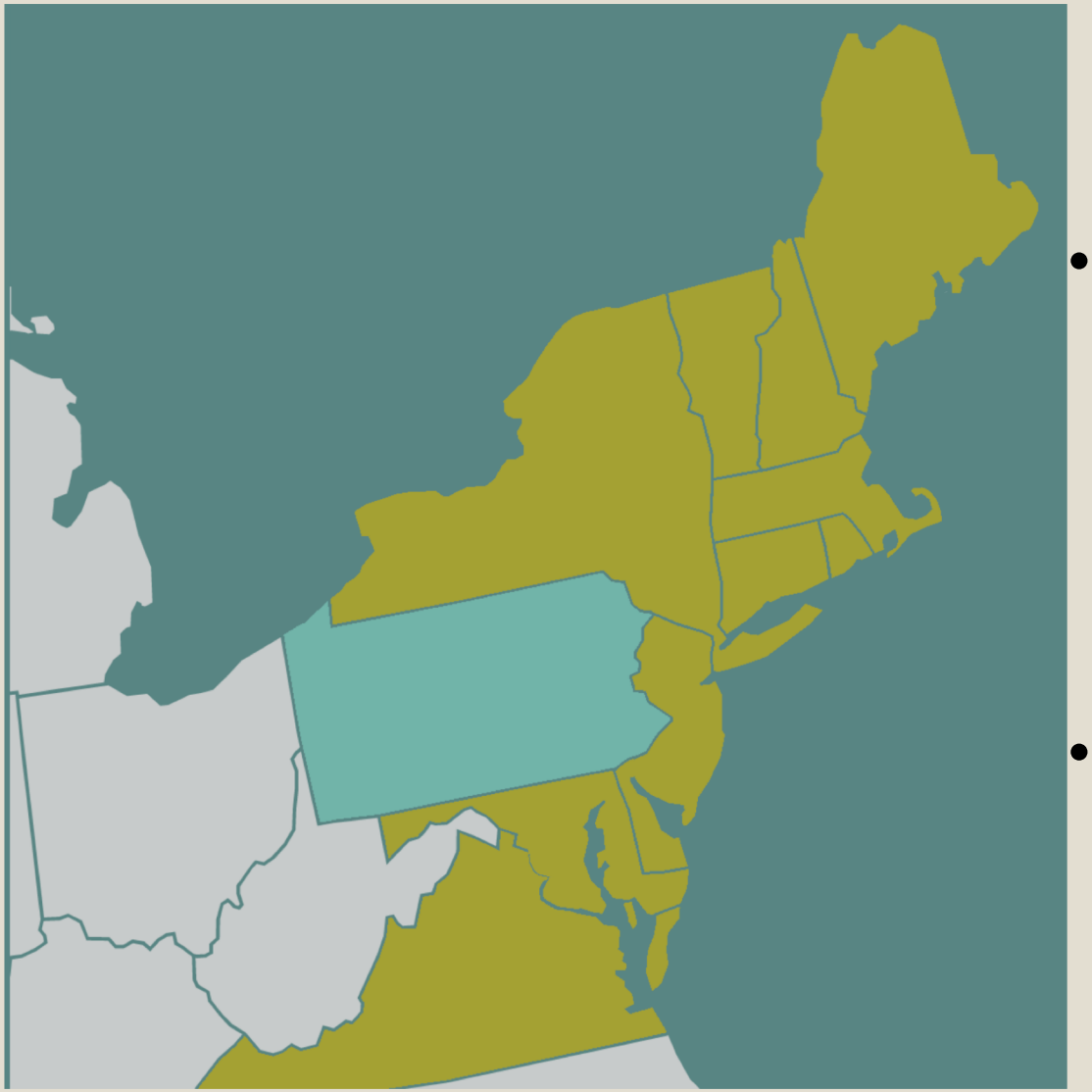
FERC Initiatives

- PJM is regulated by the Federal Energy Regulatory Commission (FERC), not the states
- Backstop siting authority for transmission
- Order 841 to support integration of energy storage into PJM's power market
- Gas transmission permitting

FERC, States and the MOPR

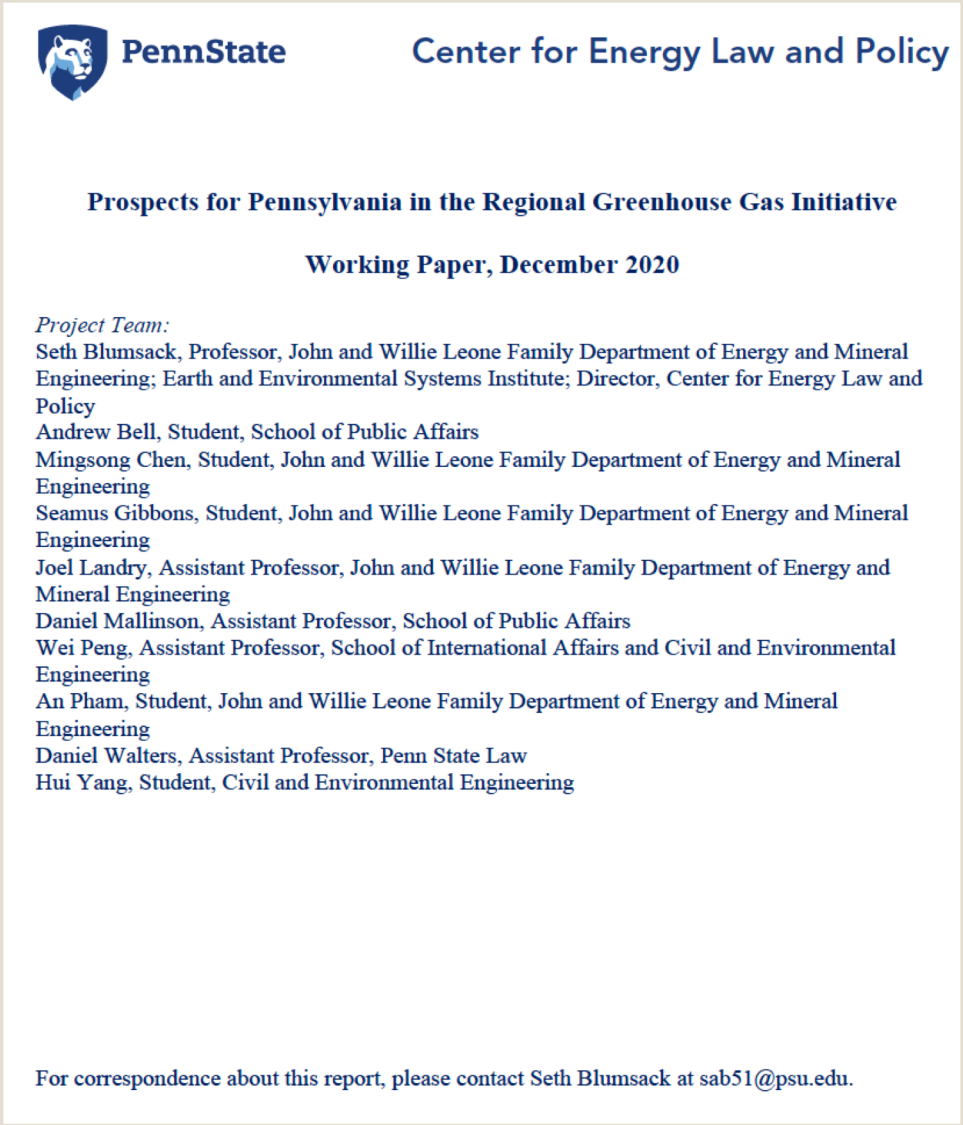
- A critical and obscure role of FERC is to balance state versus federal jurisdiction over electric generation.
- States can make generation policy, but these policy decisions affect wholesale market outcomes (which have federal jurisdiction)
- The “Minimum Offer Price Rule” was a controversial proposal by PJM to keep state generation subsidies (mostly for renewables and nuclear) from depressing PJM’s capacity prices. How FERC resolves these state/federal tensions – especially in PJM – is one of the most critical issues for utility-scale renewables.

Regional Greenhouse Gas Initiative (RGGI)



- Voluntary, multi-state compact to reduce greenhouse gas emissions from the electric power sector; it operates as a cap-and-trade system for CO_2 emissions.
- Pennsylvania is poised to join RGGI starting in 2022.

Prospects for PA in RGGI



PennState Center for Energy Law and Policy

Prospects for Pennsylvania in the Regional Greenhouse Gas Initiative

Working Paper, December 2020

Project Team:
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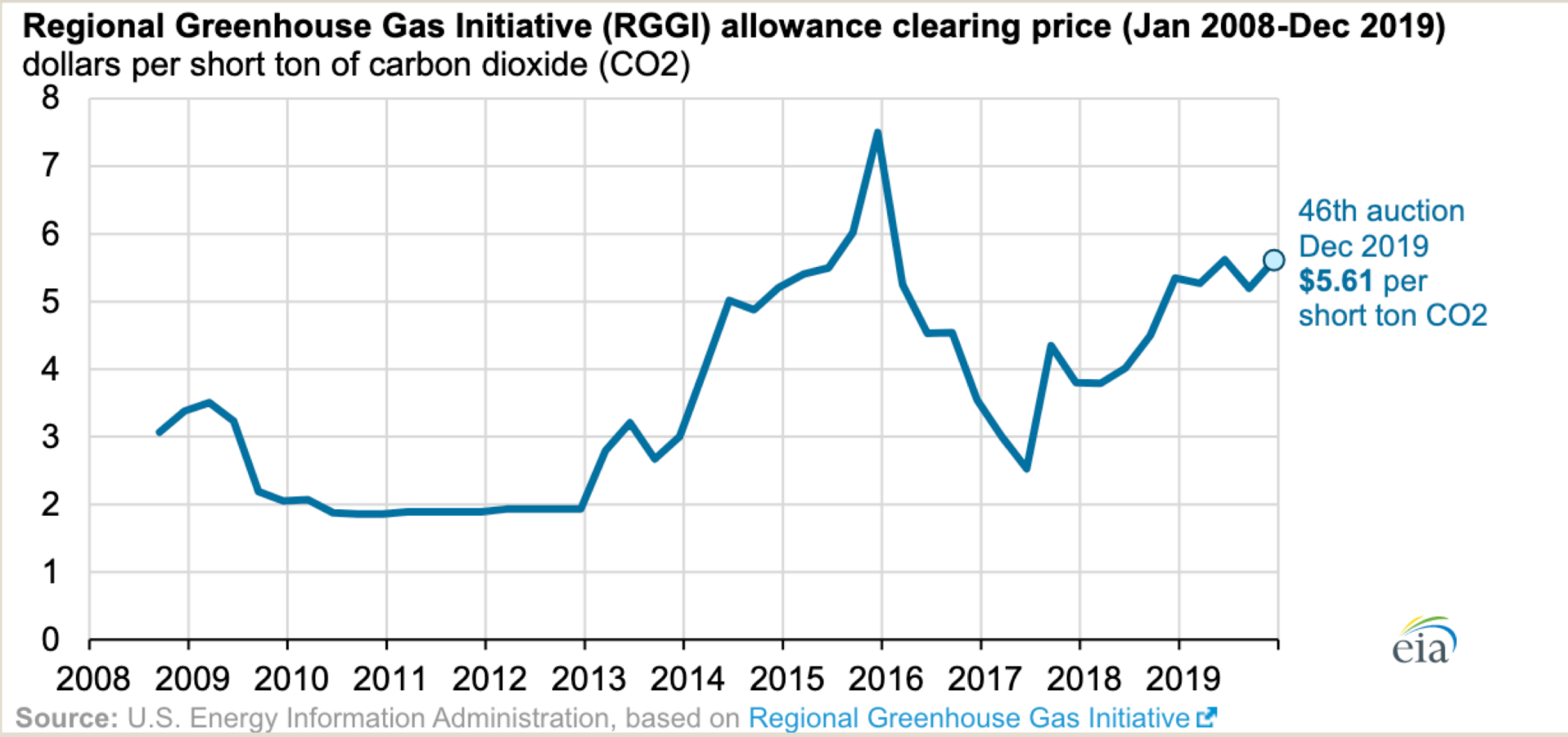
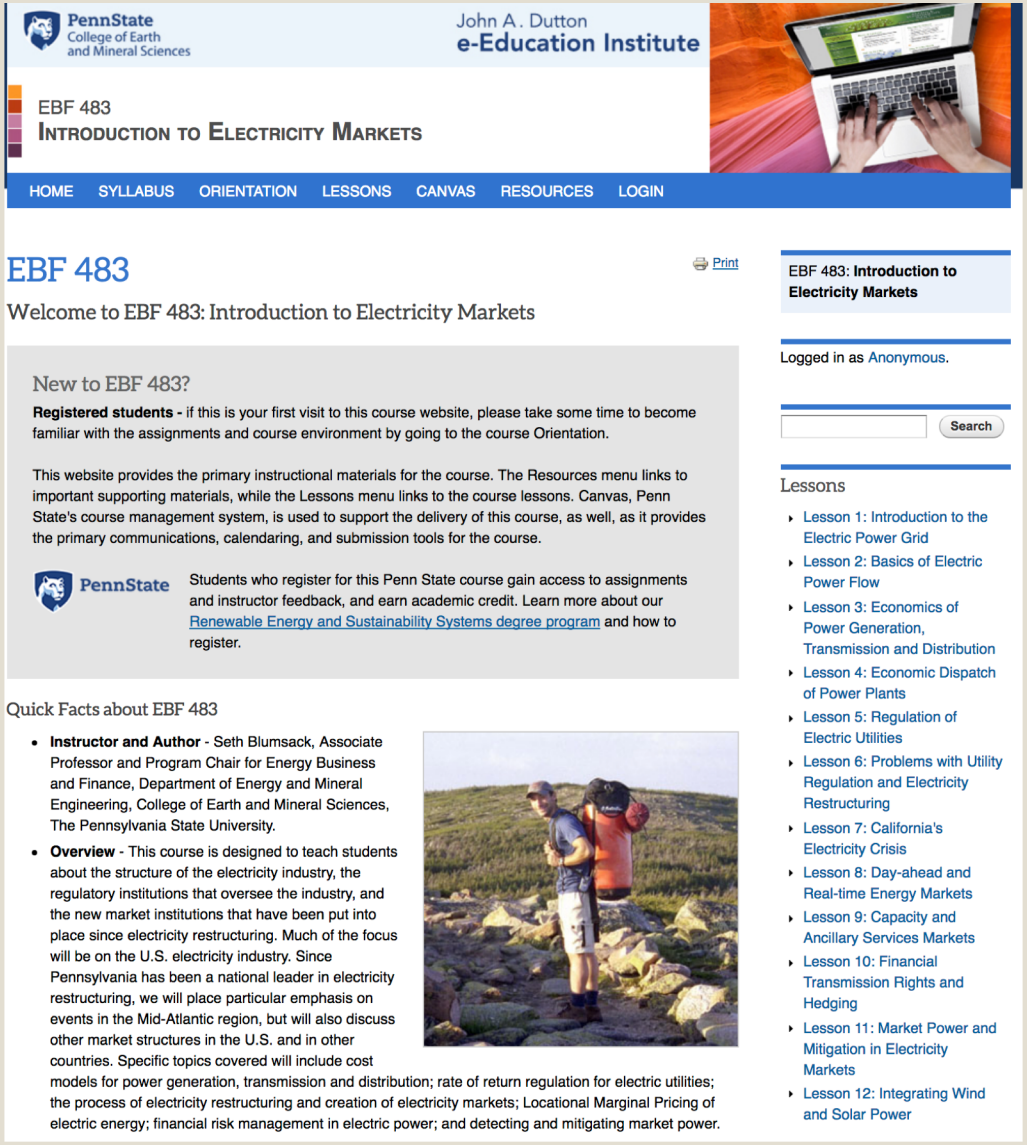
- Interdisciplinary report from the Center for Energy Law and Policy (celp.psu.edu/rggi)
- Examines the legal, environmental and energy market prospects of PA in RGGI
- RGGI has the potential to moderately increase wholesale energy costs in PJM while providing substantial climate and air quality benefits in PA.

RGGI Prices



- Future RGGI cost projections in the Center for Energy Law and Policy report amount to wholesale cost increases of a few dollars per MWh.
- Potentially beneficial for solar projects, but unlikely to be a major economic driver for new solar.

If You Want to Learn More



Penn State has an undergrad-level course online that is open to the world:

https://www.e-education.psu.edu/ebf483/

Or, just Google “EBF 483”


Thank You!
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