



**Public Interest Entities Other Users
Group – Environmental Advocates**

**Presentation for
PJM Board of Managers
May 5, 2021**

**Casey Roberts - Sierra Club
Eric Gimon - Energy Innovation
Cullen Howe - NRDC
Tyson Slocum - Public Citizen
Michael Forrester - PJM Cities & Communities Coalition**

Minimum Offer Price Rule

- PEOUG environmental organizations have consistently opposed applying the MOPR to state policy resources, as doing so would result in RPM price signals that don't reflect supply and demand fundamentals.
- We support PJM Staff's initial proposal to eliminate the MOPR as it applies to state and local policy resources.



Next Steps on Capacity Market Reforms

- Capacity overprocurement must be addressed – excessive reserve margins are not the path to reliability; dampen energy and ancillary service market signals that are essential to reliability in a decarbonizing system.
- Year-round capacity product hampers PJM’s ability to customize performance criteria and reserve margins to the season; reduces competition among suppliers.
- Governance and/or structural changes to ensure that capacity rules don’t impede state policies in the future





Bulk Power System Trends and Implications: Presentation for PJM Board of Managers

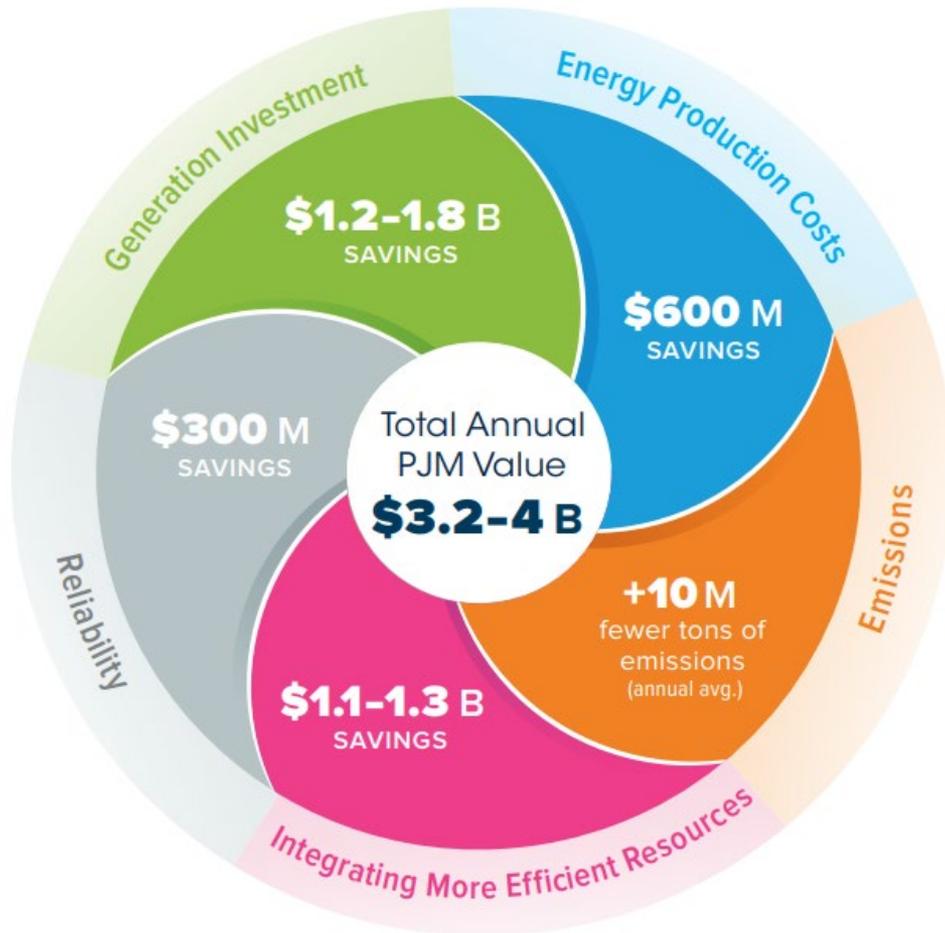
Eric Gimon, Ph.D.
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Energy Innovation, LLC

Who we are

Energy Innovation is a nonpartisan energy and climate policy firm delivering research and analysis to help policymakers make informed choices. The power sector transformation research and policy team at Energy Innovation has been leading **five-year effort to examine how power markets should/might evolve** hand-in-hand with a clean energy transition.

We are **not an environmental advocacy group** and we are **not intervenors at FERC**, but we are mission-aligned with groups like the Sustainable FERC Project.

PJM Market Benefits



We want to maintain these market benefits while:

Maintaining high standards for **reliability**

Providing a **technology neutral** platform

Incentivizing **innovation**

Working **cooperatively** state jurisdiction

Important Trends

Important electricity industry trends are being driven by steep cost decline trajectories for wind, solar, and battery storage, and significant state (and potentially federal) public policy goals for clean power:

1. More Resources, Different Resources
2. The Planning Reserve Margin is Dead
3. Portfolio Assembly is King
4. Opportunity Cost Means Something Else

Industry Trend #1

Heterogeneous Resource Mix

Past System: dominated by dispatchable fuel-burning resources (gas/coal/oil/nuclear with some hydro) with few energy limits.

Future System: Greater variety, with diversity of production characteristics along different lines:

- Year/season/time-of-day.
- Geographic
- Energy limitation.
- Supply dependency: Weather vs fuel.
- Scale and hybridization: New kinds of battery energy storage, hybrid resources, dispatchable loads, distributed energy resources.

Industry Trend #2

The Planning Reserve Margin is Dead

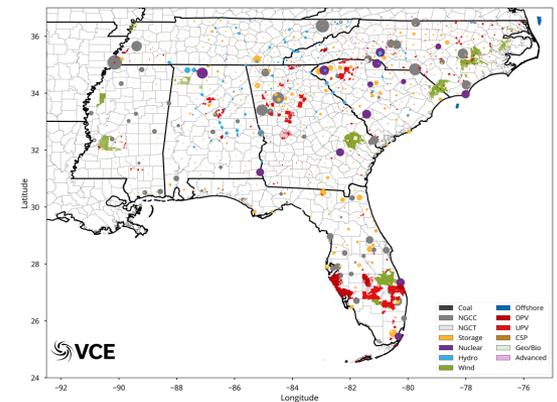
The PRM made sense in the past system. Procuring **enough resources to meet peak** typically meant resource adequacy for the rest of the year – with a few tweaks.

Future resource mix will create new potential **periods of system stress that have nothing to do with system peak** and **vary a lot** from one mix to another and potentially from one year to the next.

Pay for Performance addresses this in part but not fully.

Industry Trend #3

Portfolio Assembly is King



In Summer 2020, Energy Innovation and Vibrant Clean Energy released a study on the benefits of an ISO in the Southeast.

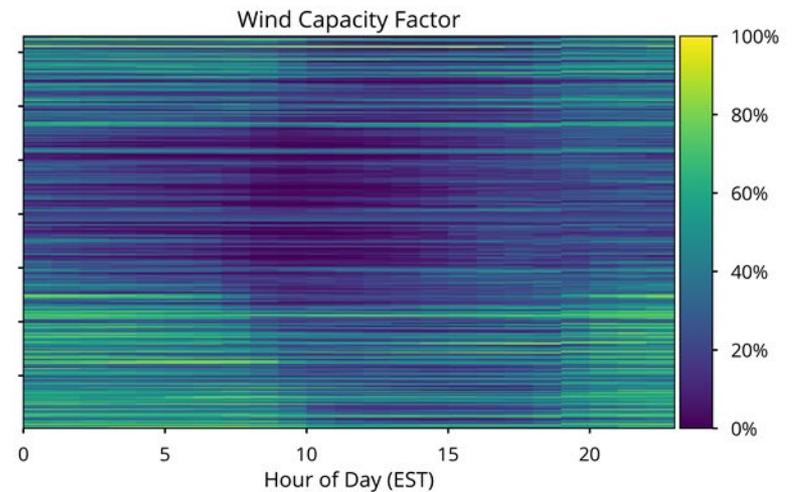
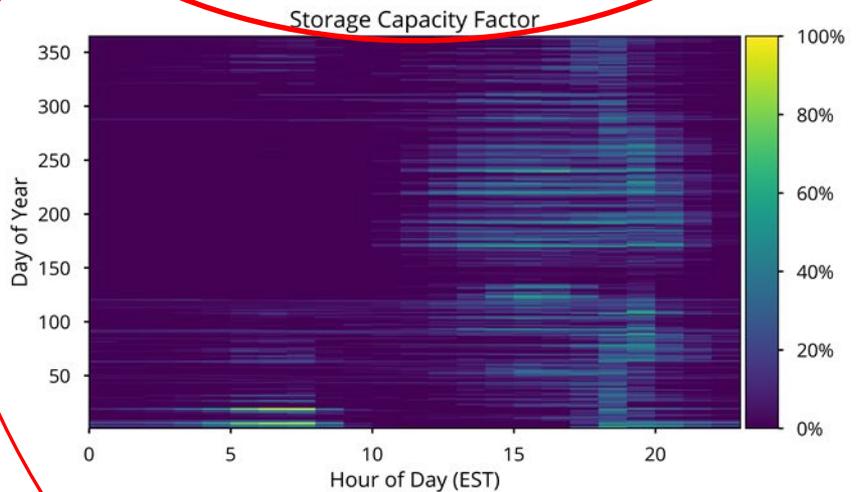
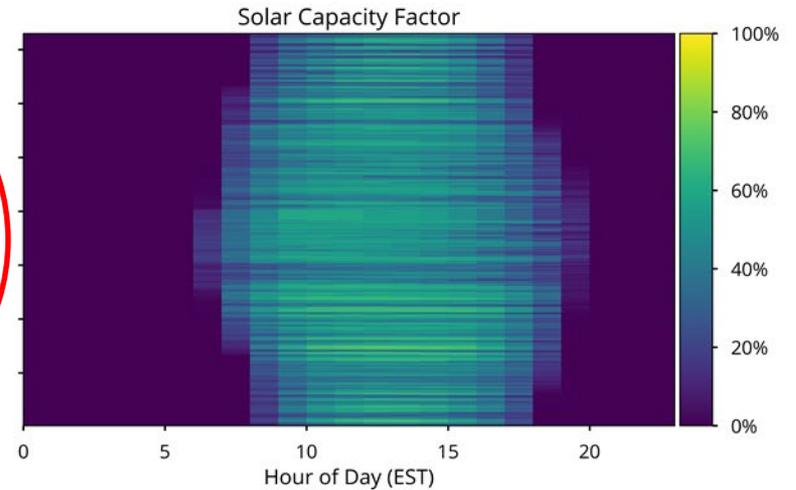
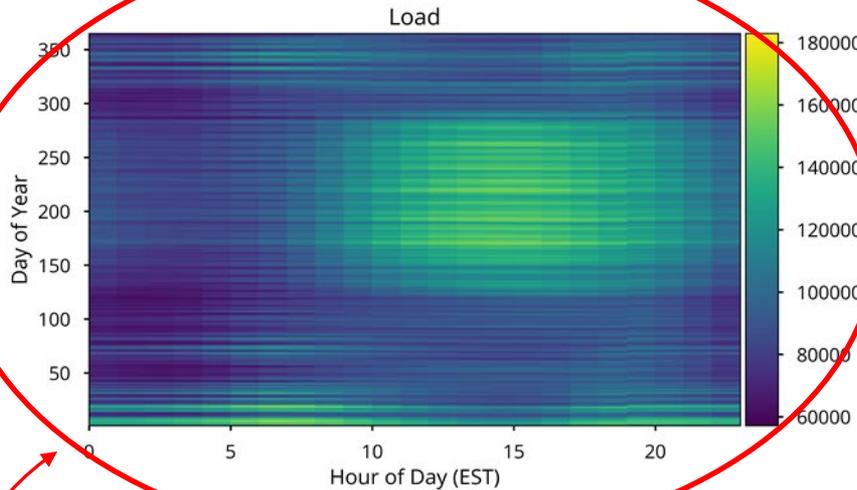
This was a co-optimized **capacity expansion and production cost model** with 8760 reliability overlay (8 possible load/weather years).

Bottom-up participation in ISO result equated with top-down optimization because of the power of markets to find **lower cost solutions** and **co-optimize multiple participant investment decisions**.

Results:

- Affirmed the immense benefits of regional optimization
- Least cost portfolio matches the “**heterogeneous resource mix,**” (**Trend 1**).
- Least cost pathways consistently **phased out existing coal**.
- **~30% wind and solar**.
- Compatible with **existing nuclear**.
- One **quarter of peak capacity is storage** (lots of distributed).

Industry Trend #3 Portfolio Assembly is King (Cont'd)



Target Profile

2040 Modeling Results from Vibrant Clean Energy Southeast
RTO study with Energy Innovation

Industry Trend #4

Opportunity Cost Means Something Else

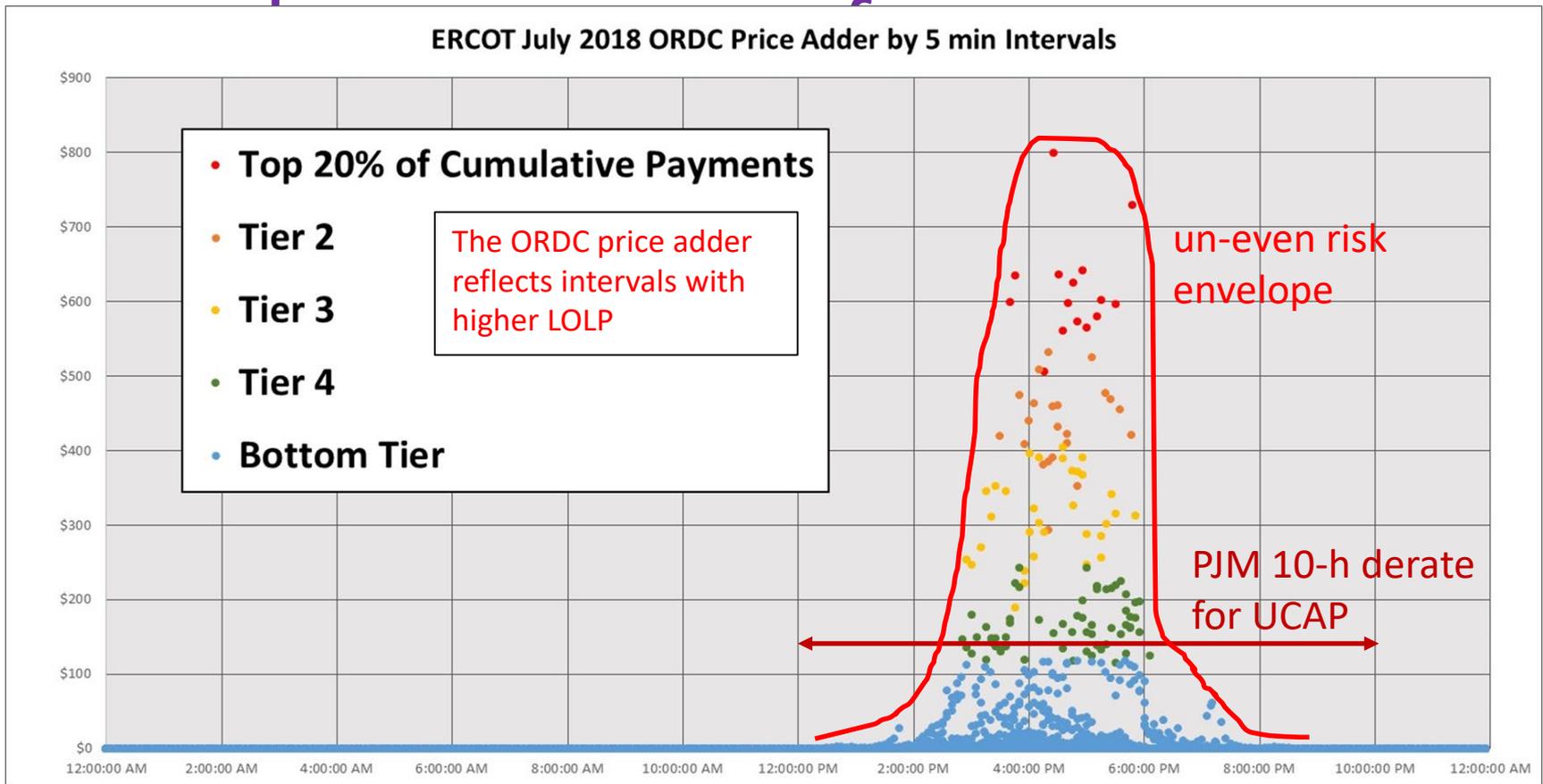
In the old system **opportunity costs mainly means the cost of fuel** – identified with short-term marginal cost (although hydro-heavy systems understand otherwise).

With the rise of cheap battery storage and DERs (Order 2222) we will see resources **with relative opportunity costs** because of energy and contextual limitations: do I charge/discharge now or later?

Current RPM is not aligned with these trends and will create headaches

- It doesn't properly **account for the diversity benefits** of a well constructed portfolio
- It has a **one-size-fits-all** view of market participant characteristics (normal for a commodity market!)
- Still oriented around a **PRM mindset** for calculating LSE obligation
- Must offer obligation and standards for dispatch potential **do not work well with energy-limited** resources and other relative opportunity cost

Example: 10-hour derate for storage



There is a tension between round-the-clock reliability mandate for the RPM and differential system stress!

Solutions we are working on at Energy Innovation

- **Organized Long-Term Markets:** Part of a trend to focus attention on upstream elements of the energy markets within a competitive paradigm. *(more available from Dec 2020 WRIT/RFF workshop)*
- **Residual Reliability Obligations:** Uses the ideas of portfolio construction to segregate reliability responsibilities between energy portfolios and a residual capacity obligation that is more tradeable. *(presented at PJM stakeholder RPM workshop)*

Thank you!

Resources:

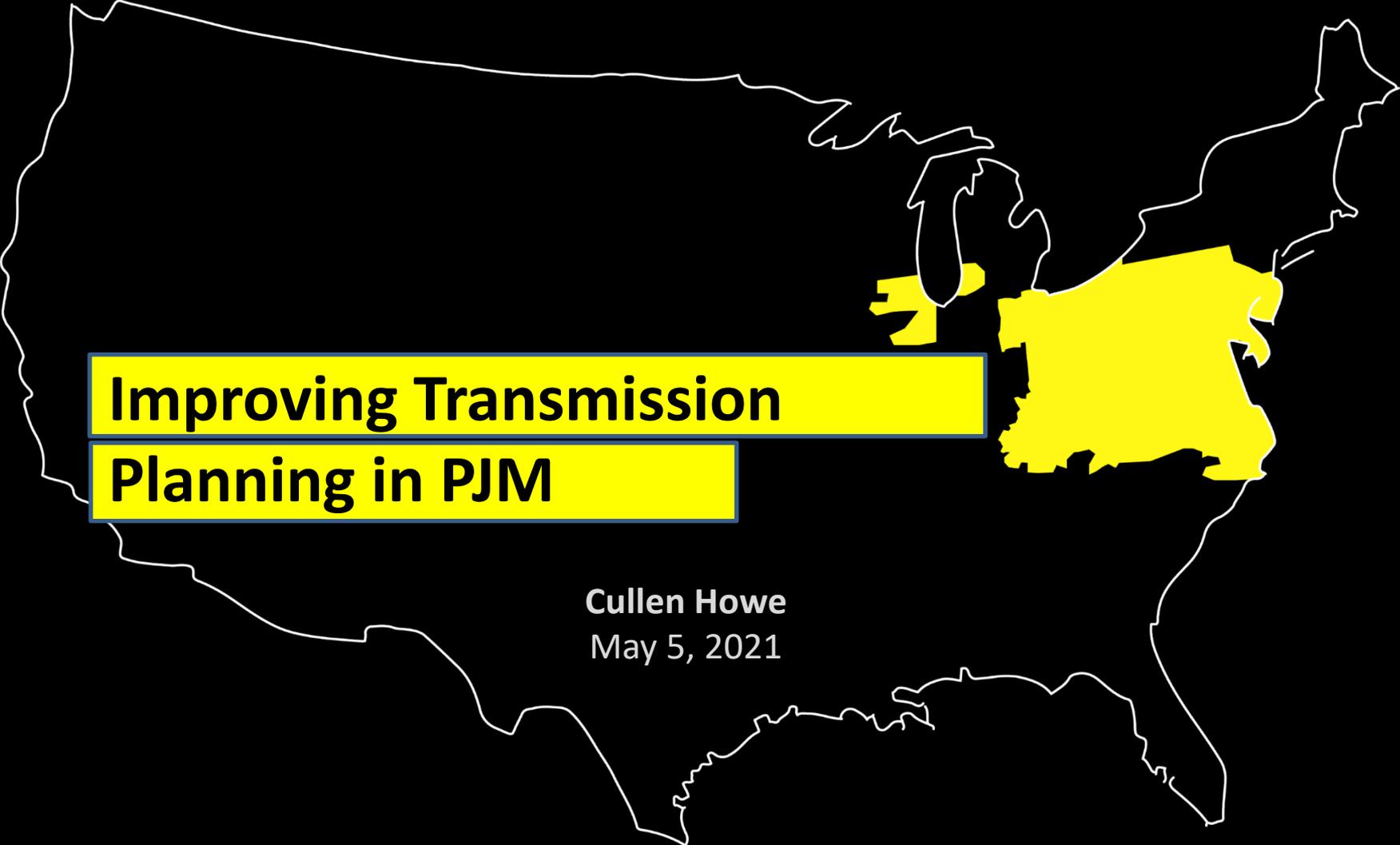
Energy Innovation papers on wholesale electricity market design for rapid decarbonization:

<https://energyinnovation.org/publication/wholesale-electricity-market-design-for-rapid-decarbonization/>

World Resources Institute and Resources for workshop on market design for the clean energy transition:

<https://www.wri.org/events/2020/12/market-design-clean-energy-transition-advancing-long-term>

Contact me at eric@gimon.org for questions or connect with me on Twitter @EricGimon

A white outline map of the United States is centered on a black background. The PJM (Piedmont and Jersey) region, including parts of Pennsylvania, Maryland, Delaware, Virginia, North Carolina, South Carolina, and West Virginia, is highlighted in a solid yellow color. Two yellow rectangular boxes with black borders are overlaid on the map, containing the title text.

Improving Transmission Planning in PJM

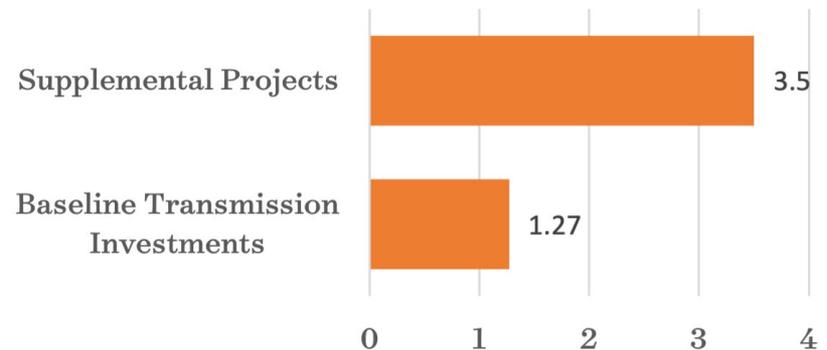
Cullen Howe
May 5, 2021

There is an urgent need to improve Tx planning in PJM

- Tx planning rules are not meeting their intended purposes and are failing to keep pace with changing resource mix from public policy and consumer demand
- Current Tx planning process does not promote proactive planning of regional and inter-regional transmission
- Most projects serve local needs or are simply replacing aging infrastructure

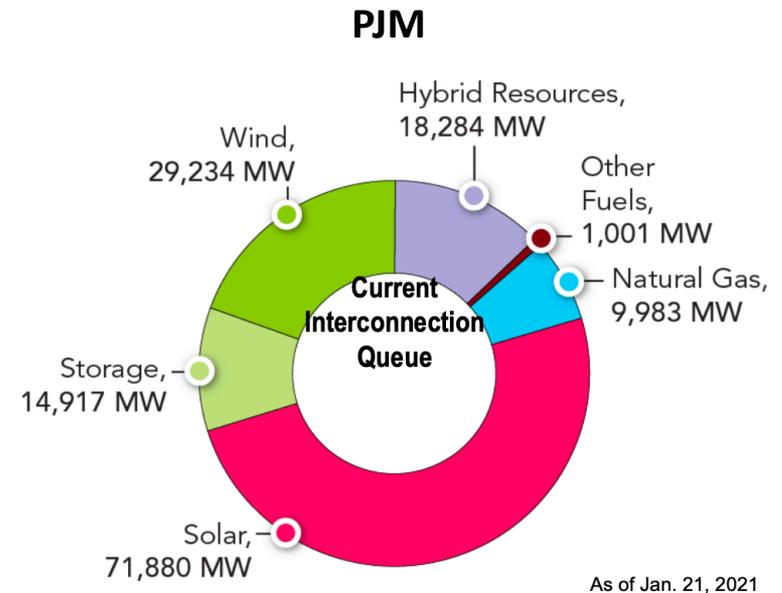


PJM (2019)



There is an urgent need to improve Tx planning in PJM

- PJM's grid is not evolving to keep pace with changing generation, changing weather patterns, and changing demand
- Result: Ever-lengthening IC queues that are primarily renewables



Recommendations

Zero Emissions Transmission Studies

- *Eyes on the Prize: Focus PJM stakeholders on what a zero-carbon PJM will look that so we can figure out how to get there.*

Expand RTEP Scenario Planning

- *Top down planning improvements are the only way to solve the interconnection problem*
- **Calculate and Report Carbon Impacts of RTEP Projects**
 - *If we're not measuring it, we can't manage it.*



PJM CITIES & COMMUNITIES COALITION

PJMCCC.ORG

Mission

The PJM Cities and Communities Coalition (PJMCCC) has been launched to coordinate the efforts of cities in the PJM territory that are interested in **removing and preventing barriers to decarbonization solutions in their regional wholesale electricity market.**

Cities are unique stakeholders for PJM and FERC:

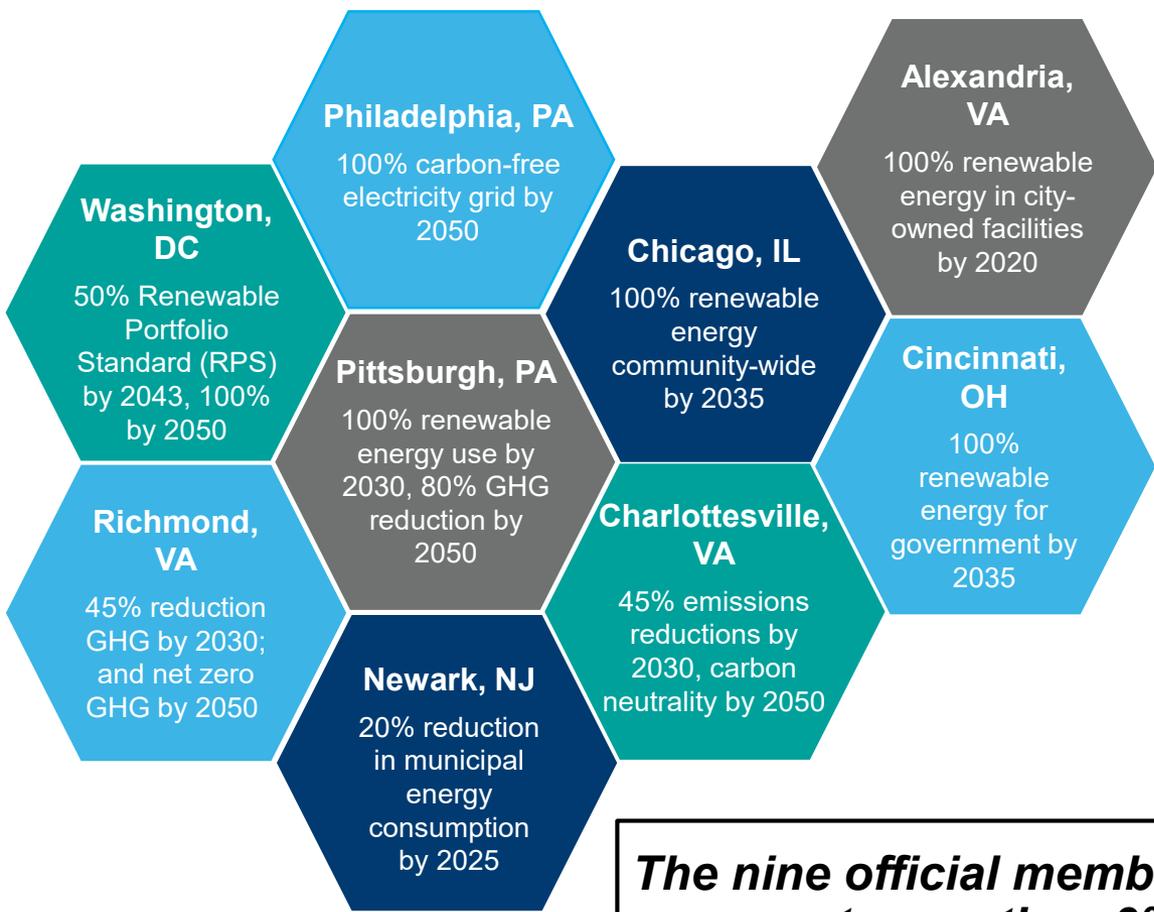
- Cities are **large consumers of energy**, which means they are directly affect by market decisions.

AND

- Cities **represent the interests of their residents** and must pursue the most favorable outcomes for them.



Chartered Members



The nine official members of PJMCCC represent more than 9% of the population served by PJM, at over six million people.



Key Actions

- Letter to PJM
 - Addressing the 2019 leadership transition at PJM
- Storage Statement
 - Support for market rules and operational changes that reduce barriers to storage deployment and allow storage to compete against other resources to earn market revenue
 - Energy storage is critical to environmental justice and the replacement of peaker plants that harm frontline communities in our cities
- Written Comment on the FERC OPP
 - Cities are unique stakeholders
 - OPP should prioritize funding, resources, and decision-making power for environmental justice groups, frontline communities, and tribal organizations
 - Public participation must be expanded within RTOs/ISOs



Thank you!

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