



VOLUME I

Executive Summary

FEBRUARY 2024

**CONSUMER ADVOCATES OF THE PJM STATES'
TRANSMISSION HANDBOOK**



Executive Summary

Electricity is an essential service integral to all aspects of modern life. From manufacturing and business to education, health care, and daily living, customers depend on affordable and reliable electric service. Congress has affirmed that “the business of transmitting and selling electric energy for ultimate distribution to the public is affected with a public interest,”¹ and therefore, electric service should be reliable and customer charges should be “just and reasonable.”² In accordance with that directive, the goals of affordability and reliability are at the heart of energy regulation and the industry as a whole. There can, however, be tension when balancing these goals, as building and maintaining a reliable grid costs money—and those costs are ultimately passed onto electric consumers. Conversely, there can be significant social and economic costs if the grid is unreliable and electric service is not available. The bottom line is that grid investments must be smart and efficient.

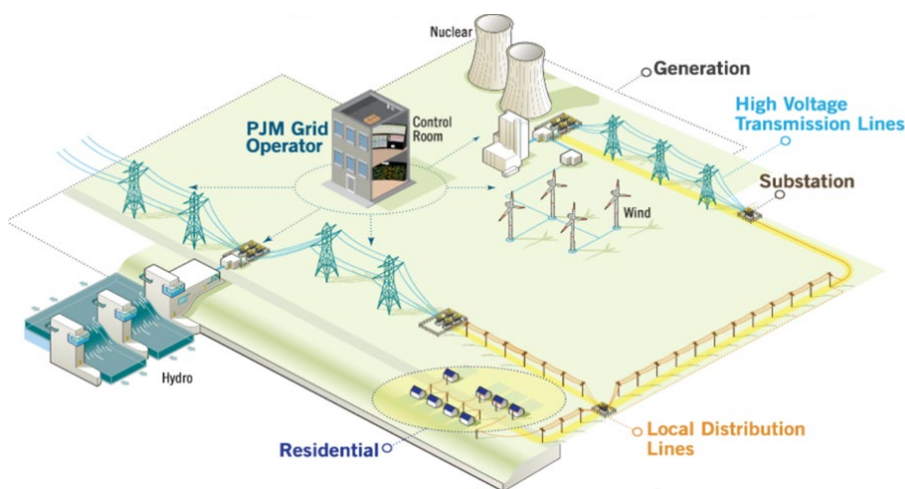


FIGURE 1. Diagram of the Electrical Power System

Transmission lines carry electricity from generation sources, like wind farms or hydroelectric plants, to lower-voltage distribution lines that transport the energy to residential and commercial users. See Handbook Volume II for more information on the electric network.

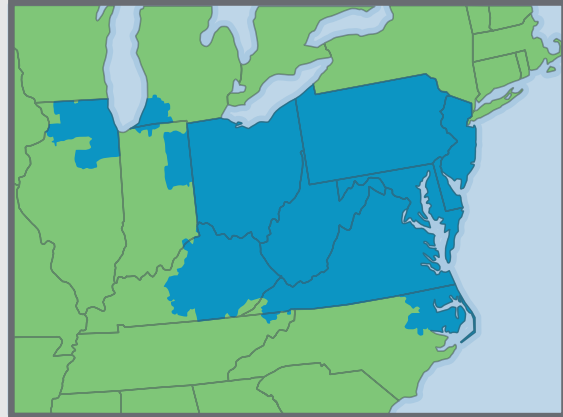
(Credit: DiCicco, Frank & Mark Saiget, “PJM Interconnection Dispatch Interactive Map Application (DIMA),” PJM Interconnection LLC, slide 5, 2016).

¹ 16 USC § 824.

² See, e.g., 16 USC § 824d.

About PJM

PJM is a regional transmission organization (RTO) that coordinates the flow of power over high-voltage transmission lines and manages the wholesale energy market, through which power is acquired and distributed to wholesale customers in all or parts of 13 states and the District of Columbia. PJM operates more than 88,000 miles of transmission lines interconnecting over 180 GW of power generation,^a which is nearly 25 percent of the electricity flows in the U.S.^b



(Credit: PJM, *Territory Served*, last accessed January 2024).

a PJM, "Meaningful Momentum PJM 2022 Annual Report," 2022.

b PJM, "The Value of Transmission," at 1, 2019.

About Consumer Advocates

Consumer Advocates are state/local agencies and nonprofit organizations designated by the laws of their respective jurisdictions to represent utility consumers' interests—in the areas of electricity, gas, telecommunications and/or water—before state and federal regulators and in the courts. The following 16 offices represent consumers in the PJM region:

DELAWARE	<u>Division of the Public Advocate</u>
DISTRICT OF COLUMBIA	<u>Office of the People's Counsel</u>
ILLINOIS	<u>Citizens Utility Board</u> <u>Office of the Illinois Attorney General (Public Utilities Bureau)</u>
INDIANA	<u>Office of Utility Consumer Counselor</u>
KENTUCKY	<u>Office of Rate Intervention</u>
MARYLAND	<u>Office of People's Counsel</u>
MICHIGAN	<u>Michigan Department of Attorney General</u>
NEW JERSEY	<u>Division of Rate Counsel</u>
NORTH CAROLINA	<u>Office of Attorney General, Utilities Section</u> <u>Public Staff, North Carolina Utilities Commission</u>
OHIO	<u>Office of the Ohio Consumers' Counsel</u>
PENNSYLVANIA	<u>Office of the Consumer Advocate</u>
TENNESSEE	<u>Office of the Attorney General, Consumer Advocate & Protection Division</u>
VIRGINIA	<u>Office of the Attorney General, Insurance & Utilities Regulatory Section</u>
WEST VIRGINIA	<u>Consumer Advocate Division</u>

Unfortunately, complex laws and regulations governing the electric system and the variety of utility accounting methodologies that determine rates can make it difficult for consumers to understand what they are paying for and why. The Consumer Advocates of the PJM States (CAPS) commissioned this handbook to assist consumers, their advocates, and others in improving their understanding of how transmission, one of the three primary components of the electric network, is developed and funded in the PJM region. The handbook is intended to: (1) demystify the transmission planning, development, and cost recovery processes, and (2) help advocates identify areas where additional transparency or process reform is needed to ensure PJM develops and maintains a cost-effective transmission network.

CAPS is particularly interested in this issue because transmission costs have been steadily rising in PJM. In fact, both PJM and PJM’s Independent Market Monitor show that transmission costs have more than doubled between 2015 and 2023 (see Figure 2).

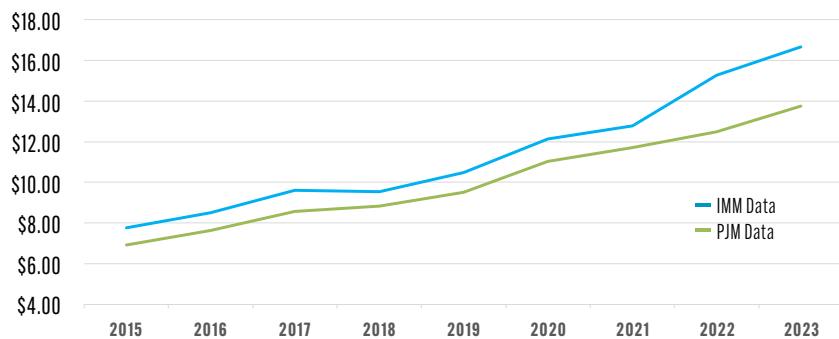
There can be valid reasons for increased spending. As America’s electric system ages beyond its intended lifespan—in PJM specifically, *two-thirds* of all system assets are more than 40 years old³—major investment is necessary to ensure the grid continues to be reliable.

Transmission assets are not alone in reaching the end of their useful life; generation units in PJM are also aging and several utilities expect to retire certain large capacity units.⁴ Coupled with the progressive climate goals in most PJM states (seven plus DC have pledged to achieve 100% clean energy or net-zero emissions)⁵, the region is increasingly dependent on new transmission to access clean resources. Additionally, portions of the region expect to see significant demand growth from new data centers and manufacturing facilities, as well as from transportation and building electrification efforts—demand that will require new transmission infrastructure to carry power where it’s needed.⁶

Because energy consumers pay for the transmission system, it is vital for the public to both understand the benefits of transmission investment and scrutinize why transmission costs are rising so substantially in PJM. No one should get a blank check to make system upgrades without proper oversight. Customers need assurance that transmission is developed in a cost-effective manner. And yet, consumers are currently short on such assurance, as many PJM transmission owners are investing heavily in “supplemental” transmission projects, which do not require PJM board approval—and generally cannot be reviewed by consumer advocates.

FIGURE 2. Transmission Costs in PJM Between 2015-2023 (\$/MWh)

TRANSMISSION COSTS IN PJM BETWEEN 2015-2023 (\$/MWH)



(Source Data, IMM Data: Monitoring Analytics, “Data: Components of PJM Price, 2015-2023,” last accessed Jan. 16, 2023; PJM Data: PJM, “Markets Report,” MC Webinar at slide 5, Jan. 22, 2024; Warner-Freeman, “Markets Report,” MC Information Webinar at Jan. 21, 2019). PJM and its Independent Market Monitor each report slightly different data, but both conclude that transmission costs are rising in the region.)

3 PJM Interconnection, “The Benefits of the PJM Transmission System,” at 5, 2019.

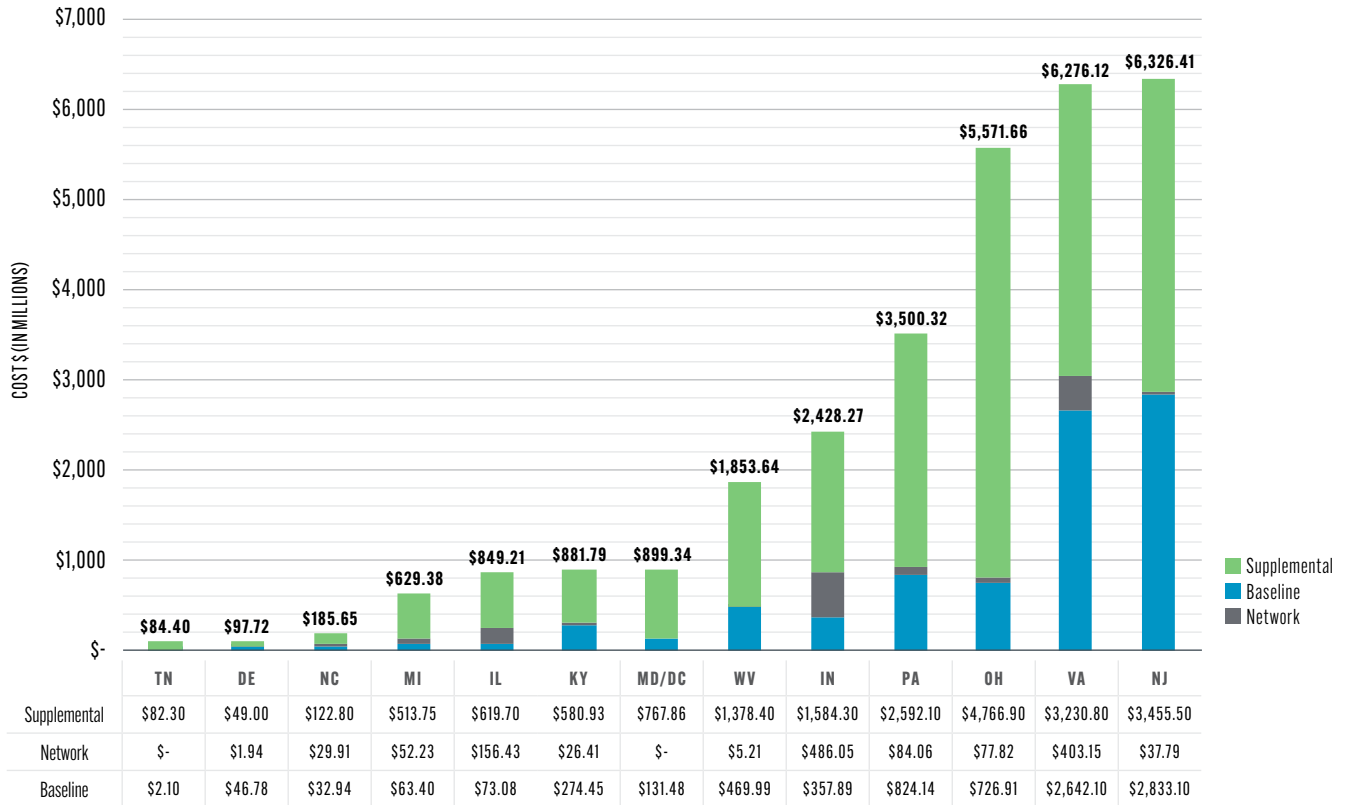
4 PJM, “Energy Transition in PJM: Resource Retirements, Replacements & Risks,” at 5-6, 2023.

5 Clean Energy States Alliance (CESA), “Table of 100% Clean Energy States,” last accessed January 2024.

6 See, e.g., Wilson, John D. and Zach Zimmerman, “The Era of Flat Power Demand is Over,” Grid Strategies, December 2023; Brigham, Kate, “Why the electric vehicle boom could put a major strain on the U.S. power grid,” CNBC, July 1, 2023.

FIGURE 3. Reported State-by-State Transmission Project Investments in the PJM Footprint, 2018-2022

PJM conducts a regular transmission planning process, known as the Regional Transmission Expansion Plan (RTEP), to evaluate grid needs—like system congestion or a reliability shortfall—and identify potential transmission projects that can address those needs. The solutions identified in this process, which involves public review and oversight from the PJM board, are known as “baseline” projects. Many utilities, however, increasingly rely on “supplemental” transmission projects which do not require approval from PJM’s board. As a result, advocates and the public have far less insight into these projects and their prudence. See Handbook Volume IV for more information on transmission planning and the differences between project categories.



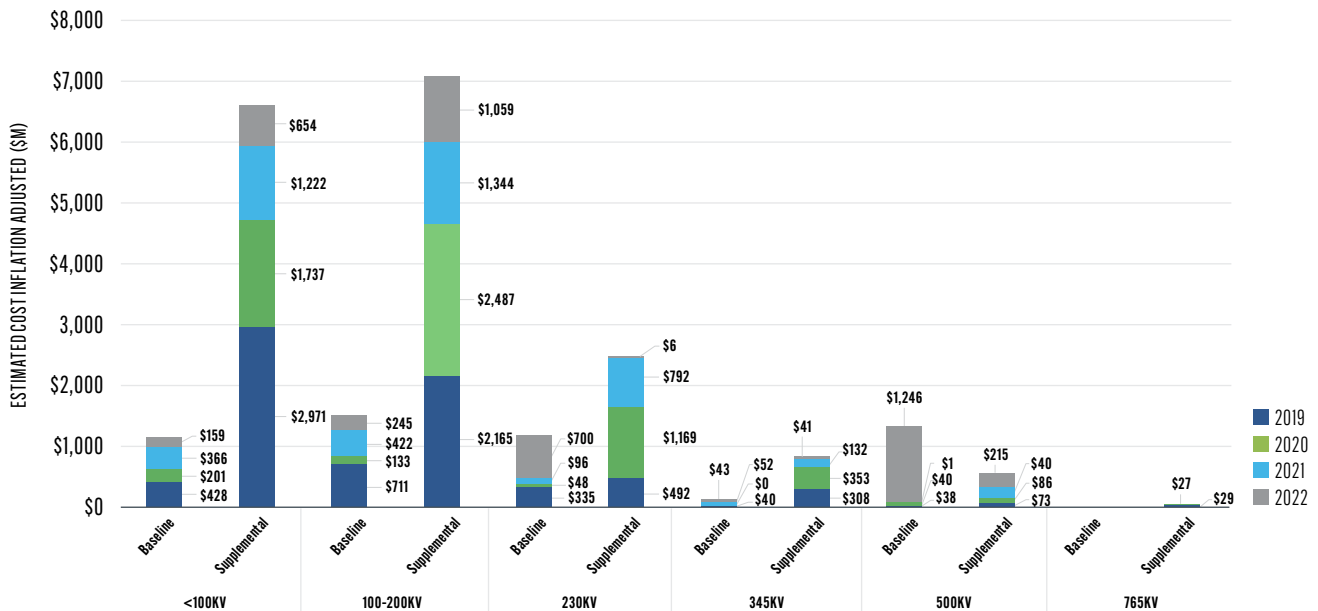
(Source Data: 2018-2022 PJM Annual RTEP Reports and Annual State Infrastructure Reports).

This handbook aims to help consumers and their advocates improve their understanding of transmission investments in the PJM region and identify opportunities to advocate for more efficient transmission development. The remaining six volumes each cover a different topic in detail. The handbook can be reviewed as a whole for those looking to gain a deeper understanding of transmission in PJM or each volume can be reviewed as a standalone document for readers who wish to focus on specific topics. More specifically:

- Volume II provides history on the U.S. electric network and PJM and explains how policies governing the network and the makeup of PJM have changed over time. The volume provides background on PJM’s governing documents.
- Volume III provides an overview of end-use customer electric bills and explains how transmission charges are integrated into those bills.
- Volume IV explores the roles of PJM, transmission owners, and others in planning new or upgraded transmission lines in the region. This volume also explores the difference between the three types of projects in PJM (baseline, network, and supplemental transmission projects) and quantifies the PJM transmission owners’ investment levels in each project type by voltage and by state.
- Volume V covers local, state, and federal approval processes for siting and permitting transmission projects.

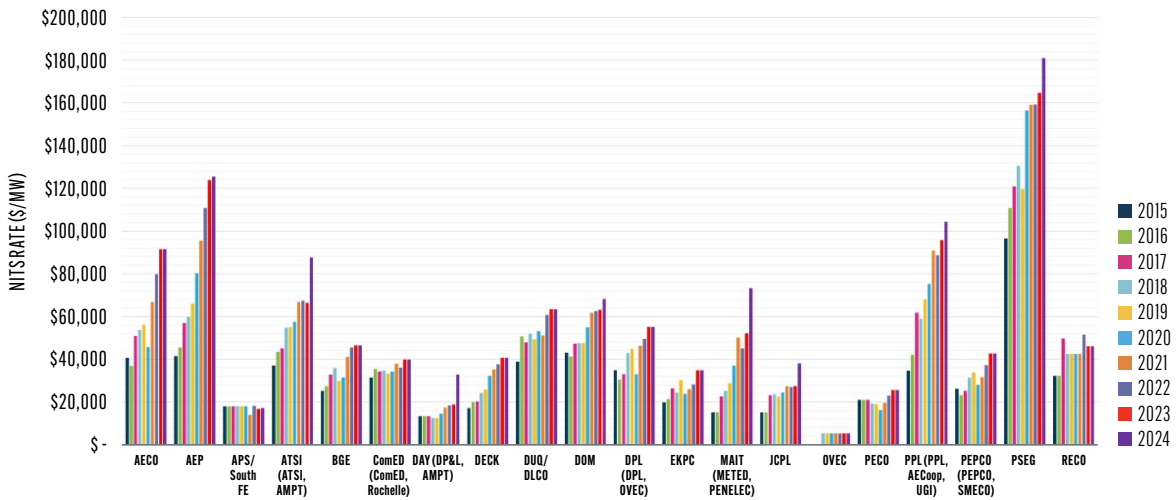
FIGURE 4. Baseline and Supplemental Projects in PJM by Voltage, 2019-2022

In addition to high levels of investment in supplemental projects, which are not subject to PJM scrutiny, most investment in the PJM region has been in lower-voltage lines. High-voltage transmission, however, plays a key role in maintaining system-wide reliability during extreme weather patterns, connecting new clean energy resources, and meeting rising electric demands. See Handbook Volume IV for more information.



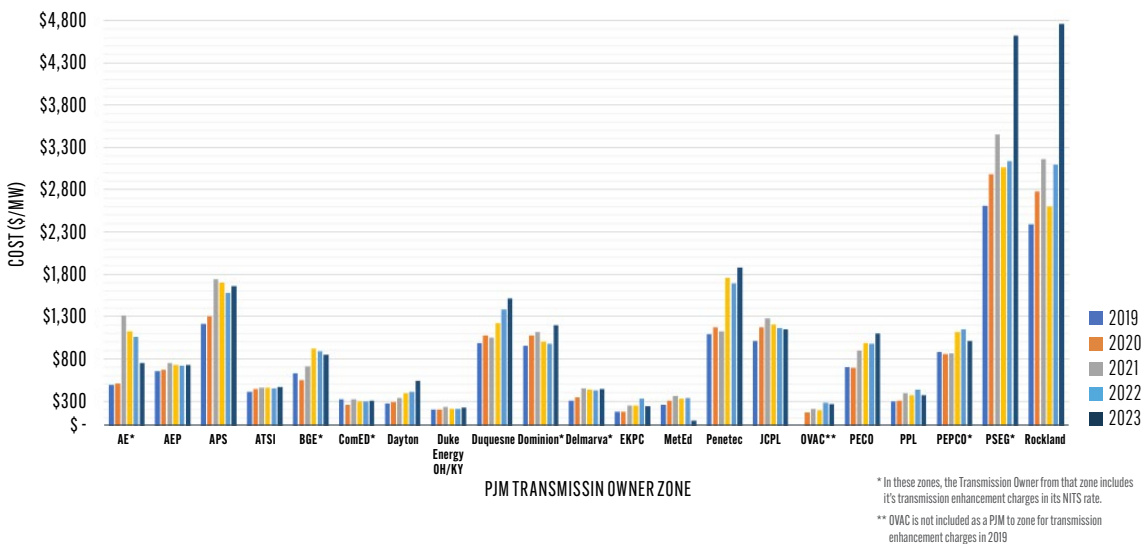
- Volume VI explains the difference between wholesale (transmission) customers and end-use/retail (distribution) customers and breaks down the main transmission charges on a wholesale customer’s bills, including Network Integration Transmission Service (NITS) charges and transmission enhancement charges. It also explains the processes that are used in PJM to determine which wholesale customers should pay for new or upgraded regional transmission infrastructure.

FIGURE 5. NITS Rates by Transmission Zone (2015-January 2024)



(Source Data: For years 2018-2024, PJM’s Annual Transmission Revenue Requirements (ATRR) and Network Integration Transmission Service (NITS) Rates reports; For years 2015-2017, Transmission Owner rate filings which were collected for CAPS by GT Power Group).

FIGURE 6. Monthly PJM Transmission Enhancement Charge Rates (\$/MW) by Transmission Zone



Network Integration Transmission Service (NITS) and Transmission Enhancement Charges are the primary charges associated with transmission service in PJM. In multiple transmission zones, these charges have been rising rapidly (see Figures 5 and 6). Handbook VI provides more information on these charges and the charts above.

- Volume VII reviews how transmission owners design their transmission service rates and explains the difference between “formula” and “stated” rates. This volume also describes how the Federal Energy Regulatory Commission (FERC) evaluates, and ultimately approves or denies, those proposals as part of a transmission rate case.
- Each handbook volume ends with a discussion on advocacy opportunities for consumers and consumer advocates. Additional outlines of advocacy opportunities are also located in the appendices to this Volume:
 - Appendix A provides a flowchart of transmission planning, development, and cost-allocation processes in the PJM region, and the type of consumer advocate engagement opportunity at each stage.
 - Appendix B provides a summary of advocacy opportunities at federal, regional, state, and local levels.

If you have any questions when reading these materials, please reach out to CAPS or your local consumer advocate office to get more information.



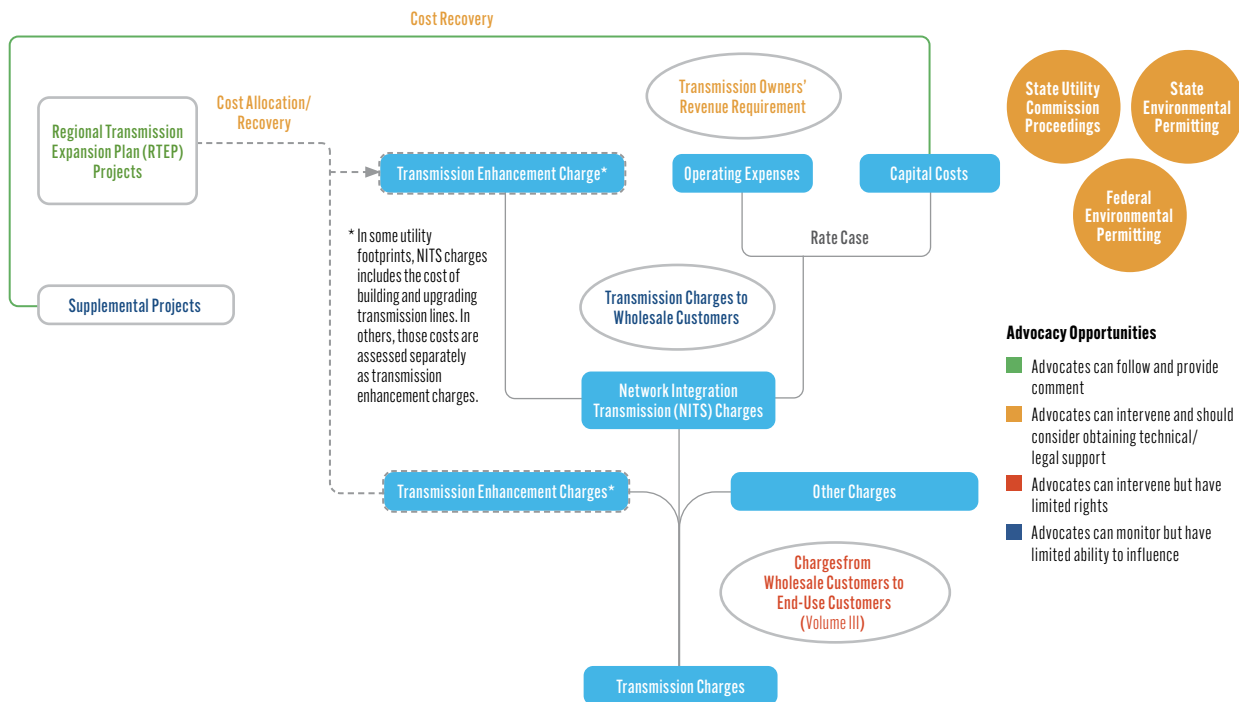
Appendix A


Understanding How Transmission is Planned, Permitted and Paid for in PJM

TRANSMISSION PLANNING Volume IV

TRANSMISSION COSTS Volume IV & VII

SITING AND PERMITTING Volume V





A | B

Appendix B

Engagement Opportunities to Impact Transmission Development and Consumer Transmission Costs in PJM

Federal Advocacy

- Congress:
 - Legislative efforts to reform transmission planning or financing
- Federal Energy Regulatory Commission (FERC):
 - FERC's rulemaking on transmission planning and cost allocation and PJM's corresponding compliance filings
 - PJM filings requesting Tariff or Operating Agreement amendments impacting transmission planning, development, or cost allocation
 - Federal Power Act Section 205 or Section 206 rate cases involving a PJM transmission owner
 - Federal Power Act 205 cost allocation filings from PJM transmission owners or PJM on behalf of the transmission owners
- Federal Siting and Permitting:
 - National Environmental Policy Act reviews of transmission projects
 - Additional federal reviews under laws such as the Clean Water Act

Advocacy at PJM

- Members Only Engagement:
 - Members Committee
 - Liaison Committee

- PJM's Stakeholder Processes:
 - Planning Committee
 - Transmission Expansion Advisory Committee (TEAC)
 - Subregional Regional Transmission Expansion Plan (RTEP) Committees
 - Long-Term Regional Transmission Planning reforms
- Conferences:
 - Organization of PJM States, Inc. (OPSI) Annual Meeting
 - PJM Annual Meeting

State, Local, and Utility Advocacy

- State legislative proceedings
- Transmission siting and permitting proceedings, including Certificates of Public Convenience and Need (CPCN) proceedings before state utility commissions
- Distribution rate cases
- Leveraging federal and state financing opportunities (e.g. Department of Energy loans and grants) to defray project costs charged to customers

ABOUT CAPS

Established in 2013, Consumer Advocates of the PJM States, Inc. (CAPS) is a non-profit organization whose members represent over 65 million consumers in the 13 PJM States and the District of Columbia. Regulatory rules vary greatly across jurisdictions, but in each the electricity costs paid by consumers is at least partly determined by the tariff and rules under which PJM operates. PJM and its stakeholders set those rules and CAPS' engagement is necessary to ensure that consumers' voices are heard. CAPS' mission is to actively engage in the PJM stakeholder process and at the Federal Energy Regulatory Commission to ensure that the prices consumers pay for reliable, wholesale electric service are reasonable.

ABOUT DGA

David Gardiner and Associates (DGA) was founded in 2001 to serve as a strategic advisor to organizations and businesses seeking a sustainable future. Our firm combines expertise developing research and analysis with deep understanding of clean energy markets and policy. DGA has worked for foundations, businesses, and non-profit advocacy groups to develop strategies to identify and promote policies that will advance clean energy and a low-carbon economy.

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