



VOLUME IV

Transmission Planning in PJM

FEBRUARY 2024

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



INTRODUCTION

The Consumer Advocates of the PJM States (CAPS) commissioned this guide to help consumers, their advocates, and others better understand how transmission is developed and paid for in the PJM region. Read the executive summary in Handbook Volume I to learn more about PJM and CAPS.

Handbook Volume IV provides an overview of:

- the three types of transmission projects that are built in PJM: baseline (also referred to as regional) projects, network projects, and supplemental projects;
- annual investment in each project by type, voltage, and jurisdiction;
- how transmission is planned in PJM, including when PJM has authority to review and approve a project;
- the reasons transmission owners build “regional” versus “supplemental” transmission projects; and
- potential opportunities for advocates to support policies that improve transmission planning processes.

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Overview of Transmission Planning

In the PJM region, the transmission owners—which include incumbent utilities and merchant developers—build and own the transmission lines. PJM operates the lines but does not itself build or own transmission infrastructure. Prior to construction, transmission lines must be planned.

As this handbook volume explores, there are some instances where a transmission owner selects the lines to construct, and its plans are not subject to PJM review or PJM board approval. In other instances, known as the Regional Transmission Expansion Plan (RTEP) process, PJM staff identify regional electricity needs and review transmission proposals that would meet those needs. The PJM board then evaluates and approves the slate of projects that will meet the identified regional needs. Even in these cases, PJM relies largely on its member transmission owners to propose projects.

A. How is transmission planned in PJM and what are some examples of project types?

There are three major types of transmission projects in PJM: **baseline upgrades**, **network upgrades**, and **supplemental transmission projects**. Each of these projects satisfy a different set of electricity needs. Understanding the primary categories can help advocates make sense of why a line gets built, the process used to plan it, and how the line will integrate with the larger regional network.

Regional transmission projects include lines that cross transmission zone boundaries or state borders within the PJM region.¹ Regional projects, also referred to in PJM as **baseline upgrades**:

- are driven primarily by the need to safeguard the reliability of the national grid by complying with required regional and national reliability criteria (e.g., North American Electric Reliability Corporation (NERC) standards discussed further in Handbook Volume II) or the utility’s own reliability criteria (which are formally documented in FERC Form 715 and can be accessed on [PJM’s website](#)); and
- may be required to ensure market efficiency criteria, public policy needs, or operational performance requirements (such as fixing congestion issues, short circuit currents, bus voltage drops, and line overloads).²

¹ PJM, “2022 Regional Transmission Expansion Plan,” at 13, 2022.

² PJM, “Regional Transmission Expansion Planning: Planning the Future of the Grid, Today,” at 3, 2019.

These projects are planned through the RTEP process and are submitted to the PJM board for their review and approval. PJM may conduct a competitive solicitation process for certain RTEP projects. In the competitive solicitation process, non-incumbent transmission owners (i.e. merchant developers) may propose solutions and be selected to build projects to resolve the identified need. The competitive process, however, does not apply to baseline upgrades that are categorized as “immediate need” projects, or projects must be built within three years to ensure the network continues to comply with reliability standards.³ Other “RTEP Proposal Window” projects are generally planned and constructed on a longer timeline (most take five-plus years).⁴

Network upgrades include infrastructure needed to interconnect a new service request to the PJM transmission network. New service requests can come from: generators seeking to interconnect a new generation resource to the network, merchant transmission facilities looking to interconnect to the network, or a new transmission request in an area with insufficient transmission capacity.⁵



Where does PJM report information about planned transmission investment?

PJM provides information about transmission investment in three primary places.

(1) Annual RTEP reports: Published every spring, these reports provide a snapshot of the previous calendar year’s regional planning process as of December 31 of the planning year. The quantitative and qualitative data includes an overview of the NERC and regional planning criteria that informed the RTEP process; RTEP study results; and state-by-state profiles with project plans and estimated costs. PJM’s public planning dashboard does not publish all data fields used to build the report. Also, the reported fields are updated on a regular basis. Consequently, it may be difficult for advocates to replicate the RTEP report results.

(2) Planning Committee (PC), Transmission Expansion Advisory Committee (TEAC), and Subregional RTEP Committee meeting materials: During these stakeholder forums, PJM presents information on the load forecasts that underpin its planning process (PC); its regional needs assessment and potential solutions (TEAC and subregional RTEP committees); and TO supplemental projects (TEAC and subregional RTEP committees). PJM has three subregional committees—Mid-Atlantic, Southern, and Western. The materials for each meeting are posted on PJM’s website.

(3) PJM’s Planning Website: PJM’s Planning dashboard provides updated graphs on project investment by category, the dates for its competitive planning process window, and links to multiple planning tools and stakeholder information. The dashboard includes a [Project Status and Cost Allocation database](#) that is updated regularly and provides a list of all baseline, network, and supplemental projects in the region.

³ Advocates can find immediate need projects on [PJM’s website](#).

⁴ PJM, “Transmission Owner Modules: RTEP Process Overview,” 2018.

⁵ PJM, “Manual 14A: New Services Request Process,” 2023.

Note on Network Upgrade Costs

Network upgrade costs have been rising in recent years. A study from the Lawrence Berkeley National Laboratory found that PJM interconnection project network upgrade costs have “risen in recent years from an average of \$15/kW in 2017-2019 to \$227/kW in 2020-2022.”^a Although project developers pay network upgrade costs, they integrate those costs into generation prices, impacting consumer power costs.

^a Seel, Joachim, et al., “Interconnection Cost Analysis in the PJM Territory,” at 6, 2023.

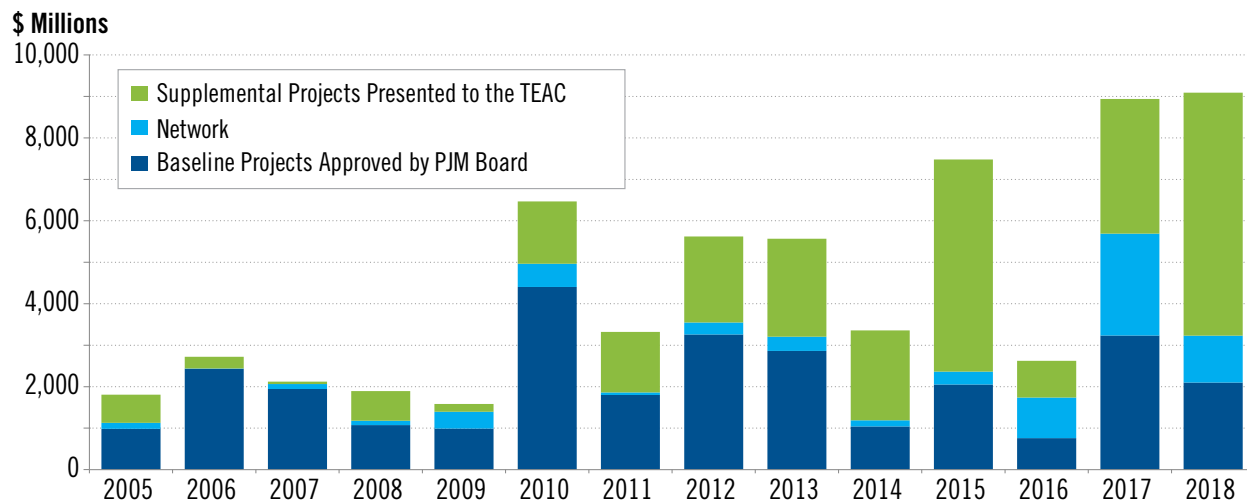
Supplemental transmission projects are planned and developed by transmission owners and include expansions or enhancements that address local reliability needs. These projects are exempt from PJM’s competitive bidding process and are not subject to PJM board review or approval.⁶ PJM’s role is solely to evaluate a proposed supplemental project’s effect on reliability of the regional grid. It does not to evaluate whether the project is needed or prudent. Per PJM’s Operating Agreement, a supplemental project is:

a transmission expansion or enhancement that is not required for compliance with the following PJM criteria: system reliability, operational performance or economic criteria, pursuant to a determination by the Office of the Interconnection and is not a state public policy project pursuant to Operating Agreement, Schedule 6, section 1.5.9(a)(iit).⁷

B. What is the level of investment in each project type?

Prior to 2010, total investment in the transmission system was under \$3 billion annually.⁸

FIGURE 1. Annually Approved Baseline and Network Projects Plus Supplementals (2005-2018)



⁶ PJM, “RTEP: Planning for Long-Term Transmission Needs,” at 2, 2022.

⁷ PJM, “Operating Agreement,” Section 1, Definitions.

⁸ PJM, “Annually Approved Baseline and Network Projects Plus Supplementals (2005-2018): The Benefits of the PJM Transmission System,” 2019.

(Credit: PJM, "The Benefits of the PJM Transmission System," Figure 4, 2019).

Since 2010, transmission investment has exponentially increased, particularly in supplemental projects. This means that customer transmission costs have also risen substantially. Because supplemental projects do not require PJM board approval, and there may be limited or no state-level review of these projects, there is little transparency into the growing customer charges associated with increasing supplemental project costs.⁹ Figure 2 shows the reported annual investment in baseline and supplemental transmission projects in PJM between 2012 and 2022.

FIGURE 2. Annually Approved Baseline and Network Projects Plus Supplementals (2012-2022)



(Credit: PJM, "Regional Transmission Expansion Plan (RTEP) 2022," Figure 5.2, 2023).

C. How can transmission lines vary in size and capacity?

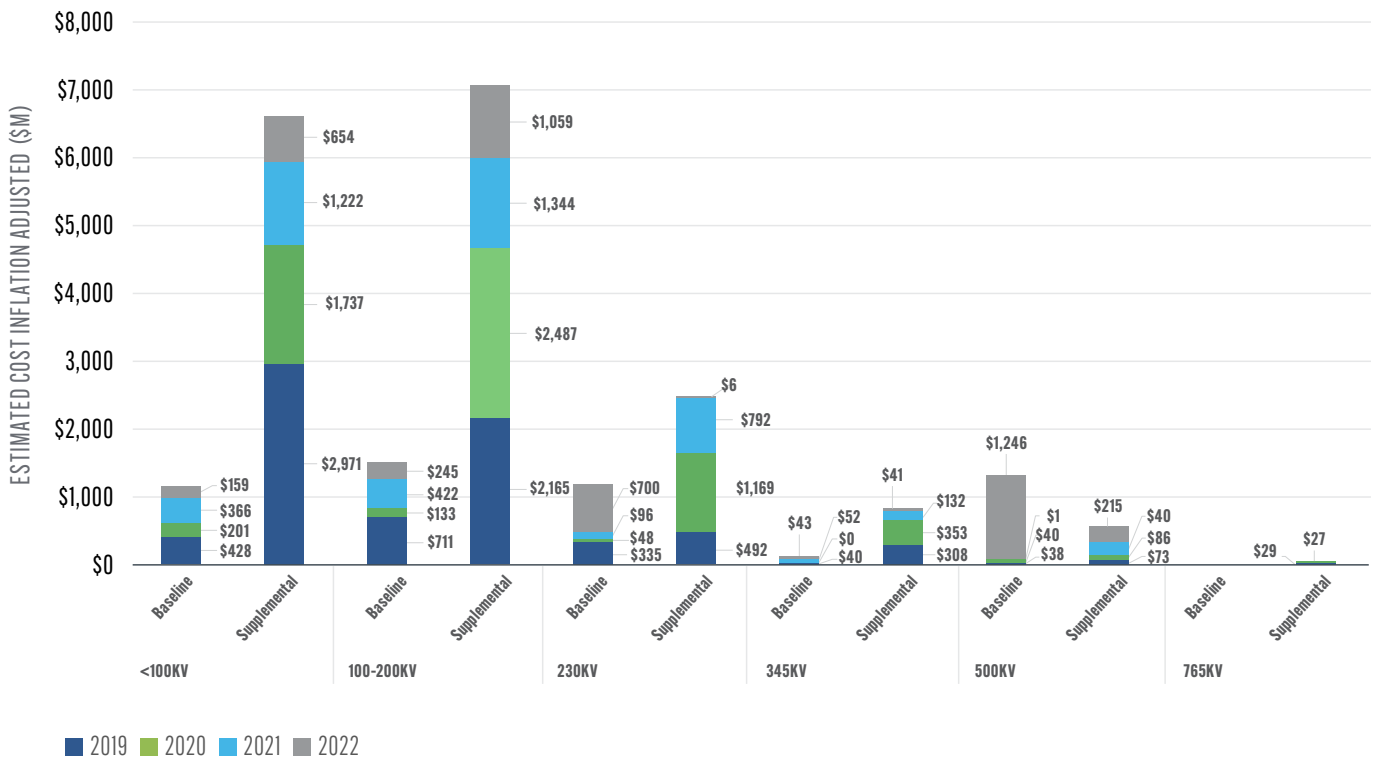
PJM's footprint includes transmission lines of varying sizes. Some are relatively short and low capacity, designed primarily to transport energy within a single utility's footprint. Long-distance and high-capacity lines, meanwhile, can improve connectivity across PJM's 21 transmission zones and the larger electric grid. These larger lines allow new resources to come online and play a crucial role in ensuring long-term electric reliability.

D. Is high-capacity transmission being added to the PJM system?

While there has been some investment in high-capacity lines, it is a small fraction compared to low- and medium-capacity projects. Figure 3 provides four years of PJM data comparing investment in baseline and supplemental projects by voltage level. Since 2018, most investment has been in projects with a capacity of 200 kilovolts (kV) or less.

⁹ GDS Associates, Inc. and McNees Wallace and Nurick LLC, "White Paper on Formula Rates and Supplemental Projects," CAPS, 2021 (CAPS White Paper).

FIGURE 3. Baseline and Supplemental Projects in PJM by Voltage (2019-2022)



(Source Data: PJM, Baseline and Supplemental Projects by Voltage, 2023).

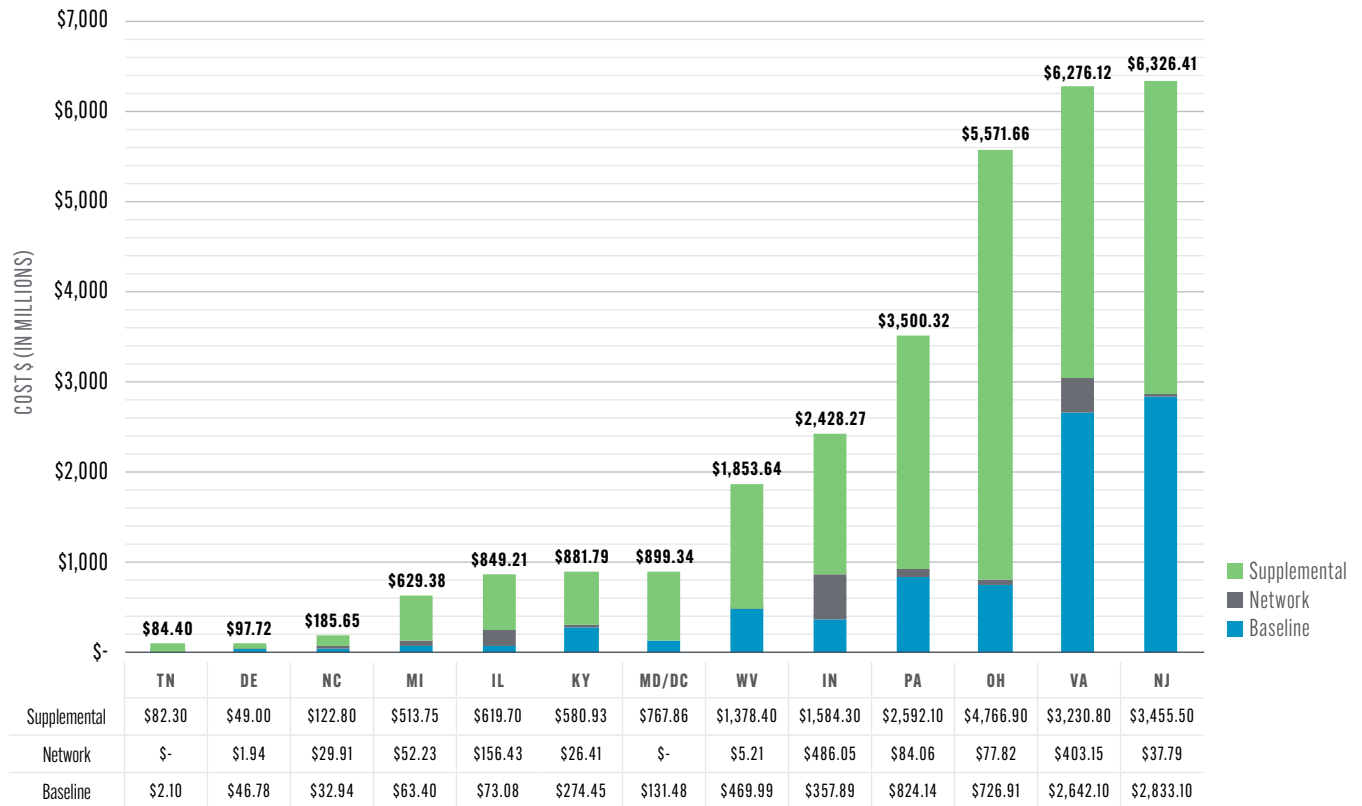
Similarly, a recent Rocky Mountain Institute (RMI) analysis found that PJM transmission spending grew 14% between 2014 and 2023; however, 71% of that spending went toward low-voltage lines operating below 230 kV. Prior to 2014, only 26% of PJM transmission expenses went toward these lower-voltage lines. RMI also found that PJM’s spending on new transmission lines (as opposed to maintenance of existing lines) has dropped 67% since 2014.¹⁰

¹⁰ Wayner, Claire, “Increased Spending on Transmission in PJM — Is It the Right Type of Line?,” RMI, March 20, 2023.

E. Is transmission investment consistent across each PJM state?

It is not. Figure 4 below compares the total investment in the PJM footprint by state and project type, with Maryland and D.C. reported together. Appendix A provides more detailed profiles of the investment in each PJM state.

FIGURE 4. Reported State-by-State Transmission Project Investments in the PJM Footprint (2018-2022)



(Source Data: PJM RTEP Reports, 2018-2022).

F. Why does investment differ from state to state?

There are multiple reasons for the variation, including, but not limited to:¹¹

- size of the state footprint in PJM,
- differing demand profiles,¹²
- infrastructure age,
- extreme weather events and associated reliability needs (e.g. Hurricane Sandy in New Jersey),
- state statutes and policies that impact transmission needs (e.g. renewable portfolio standards),¹³ and
- state generation resource mixes.

¹¹ PJM, "Planning for the Grid of the Future in PJM," 2022.

¹² U.S. Energy Information Administration, "U.S. Overview, State Profiles and Energy Estimates," last accessed Dec. 17, 2023.

¹³ NC Clean Energy Technology Center, "DSIRE, Renewable & Clean Energy Standards," December 2023.



Regional Planning in PJM

Regional Transmission Organizations (RTOs) like PJM do not themselves own, build, or pay for transmission, but they do review proposed regional projects and decide which ones are necessary to promote a reliable and economic system. In PJM, the regional transmission plan process (or RTEP) is comprised of two main steps: determining transmission needs across the PJM footprint and identifying specific solutions.

A. How does PJM decide when a new or upgraded transmission is necessary?

The first step in PJM's transmission planning process is to investigate when and where new transmission infrastructure is needed to ensure the grid can reliably generate and deliver power to all customers. During the RTEP process, PJM staff complete load forecasting, conduct studies to determine when grid conditions may become stressed, and gather information about generating resources, transmission topology, demand resources, and bilateral transactions.¹⁴ The Planning Committee, which is a standing committee per PJM's Operating Agreement, considers inputs during this step.

B. What types of transmission solutions does PJM look for?

New or upgraded transmission projects must satisfy a *specific* need for energy customers. The PJM tariff, in compliance with FERC Order No. 1000, sets out three possible “drivers” for transmission projects: **reliability**, **economic efficiency**, and **public policy**.

- (1) **Reliability:** Reliability is the primary driver for RTEP projects. Reliability-oriented projects help ensure compliance with NERC standards and other national or regional regulations to make sure the grid continues to function reliably.
- (2) **Economic:** As part of the RTEP process, PJM may run a market efficiency analysis to identify transmission enhancements or expansions that could alleviate constraints and reduce electricity costs for customers.

¹⁴ Learn more about load forecasting on [PJM's website](#).

Inputs for the market efficiency analysis include “load and energy forecasts for each PJM zone, fuel costs and emissions costs, expected levels of potential new generation and generation retirements and expected levels of demand response.”¹⁵ An economic impact might include system limitations that lead to significant historical gross congestion; substantial future congestions as identified by the market efficiency analysis; or reliability pricing model constraints.¹⁶

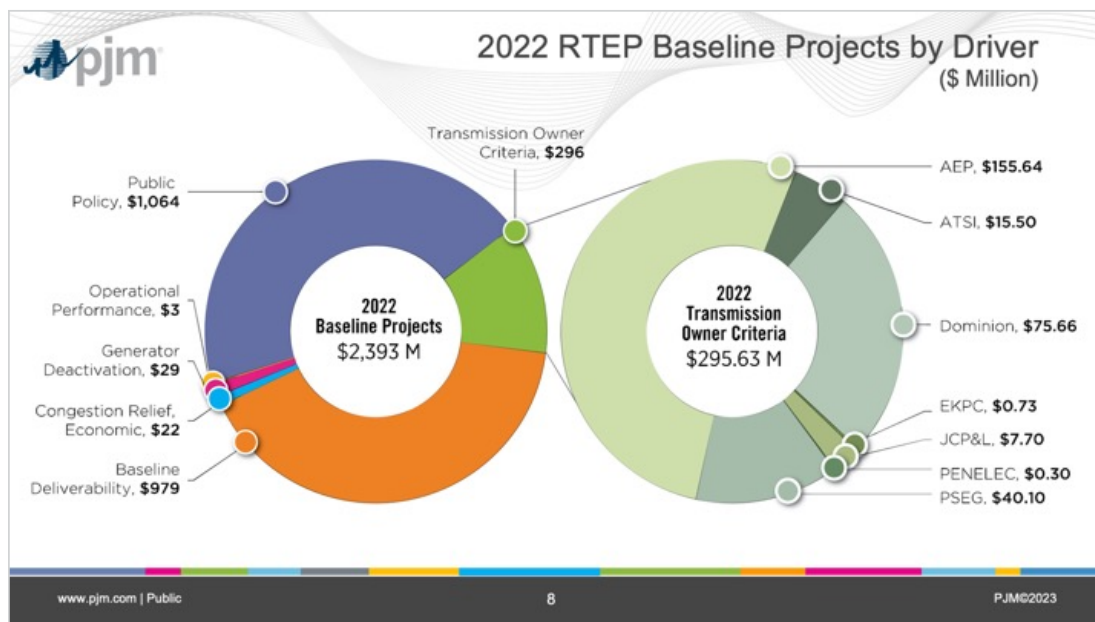
(3) **Public Policy:** Under FERC Order No. 1000, PJM is required to consider how public policy requirements drive transmission needs.¹⁷ Public policy refers to laws, regulations, and other initiatives at the federal, state, or local level that could impact the region’s need for additional transmission capacity. PJM’s Operating Agreement (Section 1) defines public policy as:

- policies pursued by “state or federal entities, where such policies are reflected in duly enacted statutes or regulations, including but not limited to, state renewable portfolio standards and requirements under Environmental Protection Agency regulations;”
- policies pursued by “local governmental entities such as a municipal or county government, where such policies are reflected in duly enacted laws or regulations passed by the local governmental entity;” and
- public policy initiatives of state or federal entities that have not been codified into law or regulation, but which nonetheless may have important impacts on long term planning considerations.

Public policy transmission projects include those designed to address laws and regulations to reduce greenhouse gas emissions.¹⁸ Many states within PJM have Renewable Portfolio Standard (RPS) targets that require an increasing percentage of renewables be interconnected to the grid each year. In turn, that RPS policy might drive the need for a new transmission line if there is insufficient capacity to connect the new generation resources.

Figure 5 provides a breakdown of the drivers for PJM’s 2022 baseline projects.

FIGURE 5. 2022 RTEP Baseline Projects by Driver (\$ Million)



(Credit: PJM, “2022 RTEP Report Key Maps, Tables & Figures,” at Slide 8, 2022.)

¹⁵ PJM, “Manual 14B: PJM Region Transmission Planning Process,” at 22, 2023.

¹⁶ PJM, “Manual 14B: PJM Region Transmission Planning Process,” at 52, 2023.

¹⁷ PJM Interconnection, L.L.C., 142 FERC ¶ 61,214, P 2 (2013), on reh’g PJM Interconnection, L.L.C., 147 FERC ¶ 61,128 (2014).

¹⁸ PJM, “2022 Regional Transmission Expansion Plan,” 2023.

C. How does PJM identify specific transmission solutions?

After determining the need—and depending on the project type, voltage level, and overall scope—PJM’s board might seek competitive solutions and bids to build from both the incumbent utilities and merchant developers. PJM reviews the proposals with stakeholders through the TEAC and Subregional RTEP committees. These groups can provide input but do not have voting rights when solutions are chosen. PJM then recommends a selection of projects in an RTEP plan to the board for review. If the board finds the plan to be consistent with the requirements set out in PJM’s Operating Agreement, it will approve the projects.¹⁹

PJM Governing Documents that Inform the Planning Process

The RTEP process is governed and guided by the following:

- The PJM Tariff;
- The PJM Consolidated Transmission Owners Agreement (see Handbook Volume II for more information);
- PJM Operating Agreement, Schedule 6 - “Regional Transmission Expansion Planning Protocol” which sets out the RTEP planning and solution selection process; and
- PJM Operating Agreement, Schedule 12, “Transmission Enhancement Charges” for funding Baseline Upgrades (see Handbook Volume VI).

Additionally, the **PJM Manual 14 series** provides more detail on PJM’s “process and rules relative to transmission service, transmission planning, transmission and generation interconnection, and competitive planning.”^a This series includes PJM Manual 14B, “PJM Region Transmission Planning Process,” which provides an overview of the PJM planning process, transmission planning criteria and methodologies to conduct the studies. This manual also includes the procedures for cost allocation.

^a CAPS White Paper at 12.

D. How far out does PJM plan transmission?

During the RTEP process, PJM runs two parallel study processes to evaluate transmission needs.²⁰ One is conducted annually and uses a five-year planning horizon to identify near-term reliability issues. The other is conducted across two consecutive years and examines longer-term reliability issues in the PJM territory.

PJM is developing an additional planning process, known as Long-Term Regional Transmission Planning (LTRTP). In the LTRTP process, PJM plans to examine transmission needs and solutions fifteen years into the future. In 2023, PJM held several stakeholder workshops to discuss the LTRTP design, and in early 2024, PJM began discussions on manual revisions needed to implement the proposed process. As U.S. energy loads evolve—for instance due to rising demand from data centers or more frequent extreme weather—transmission advocates have been urging RTOs to conduct forward-looking planning.

¹⁹ PJM Operating Agreement, Schedule 6; see also PJM, “Regional Transmission Expansion Planning: Planning for the Future of the Grid, Today,” 2019.

²⁰ CAPS White Paper at 13.

E. Can transmission lines have more than one driver?

Transmission projects that address more than one need can be addressed with multi-value planning and are known as “multi-driver” projects. For example, a single transmission line may improve reliability *and* lower congestion costs. Or it may improve reliability *and* allow new solar generation to connect to the grid. The PJM tariff allows for multi-value planning, however as of January 2024, PJM has proposed to include only one multi-driver project in its RTEP plans Supplemental Project Planning²¹

Quick Links on PJM’s RTEP Process

Stakeholder Process Information:

<https://pjm.com/planning/rtep-development/stakeholder-process>

Most Recent RTEP report and State Reports: <https://www.pjm.com/library/reports-notice/rtep-documents>

PJM Learning Center: <https://learn.pjm.com/three-priorities/planning-for-the-future>

PJM Operating Agreement, Schedule 6, Regional Transmission Expansion Plan: <https://pjm.com/directory/merged-tariffs/oa.pdf>

Manual 14b, PJM Region Transmission Planning Process: <https://www.pjm.com/-/media/documents/manuals/m14b.ashx>

Planning Committee: <https://www.pjm.com/committees-and-groups/committees/pc>

Transmission Expansion Advisory Committee: <https://www.pjm.com/committees-and-groups/committees/teac>

Subregional RTEP Committees:

Mid-Atlantic: <https://www.pjm.com/committees-and-groups/committees/srtepm-a>

Southern: <https://www.pjm.com/committees-and-groups/committees/srtepm-s>

Western: <https://www.pjm.com/committees-and-groups/committees/srtepm-w>

²¹ PJM, “Board Approves RTEP Updates, Including Multi-Driver Project,” Feb. 21, 2023 (referencing PJM Interconnection Staff White Paper, “Transmission Expansion Advisory Committee (TEAC) Recommendations to the PJM Board,” at 3, February 2023 (discussing Baseline Project b3775.1-10: Crete-St. John Area Improvement)).



Supplemental Project Planning

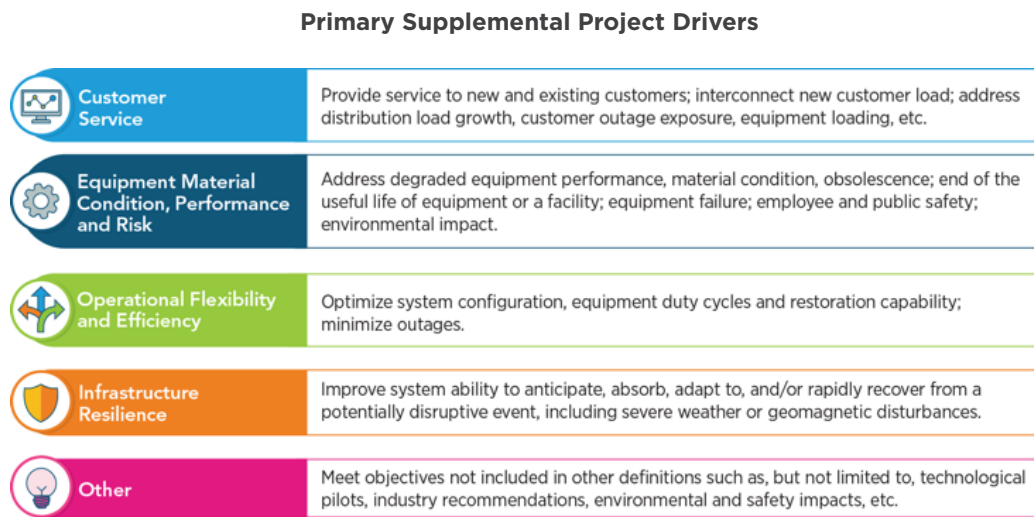
CAPS' White Paper provides a helpful overview of supplemental project planning.

Supplemental Projects proposed by the incumbent TOs are reliability driven and generally relative to a TO's asset management of its existing transmission facilities. Supplemental Projects refer to transmission enhancements different than the system upgrades triggered by compliance with NERC (i.e. facilities 100kV and above) and regional reliability criteria, operational performance, and/or market-efficiency economic criteria. Though not precisely defined in either the Tariff or Manual 14B, these projects are meant to cover a series of Asset Owner needs that stem from good utility practices relative to maintaining the reliability of the transmission system, enhancing system resilience, and improving service to customers by assuring reliable connectivity. These projects however are introduced to the PJM regional planning process through the TEAC and sub-regional RTEP committees and included in the Local Plan. The Supplemental Projects – although captured in the RTEP models and evaluated to ensure that they would meet NERC and regional reliability criteria – are not subject to PJM Board approval.²²

²² CAPS White Paper at 13-14.

Figure 6 shows the main reasons a TO might propose building a supplemental project.

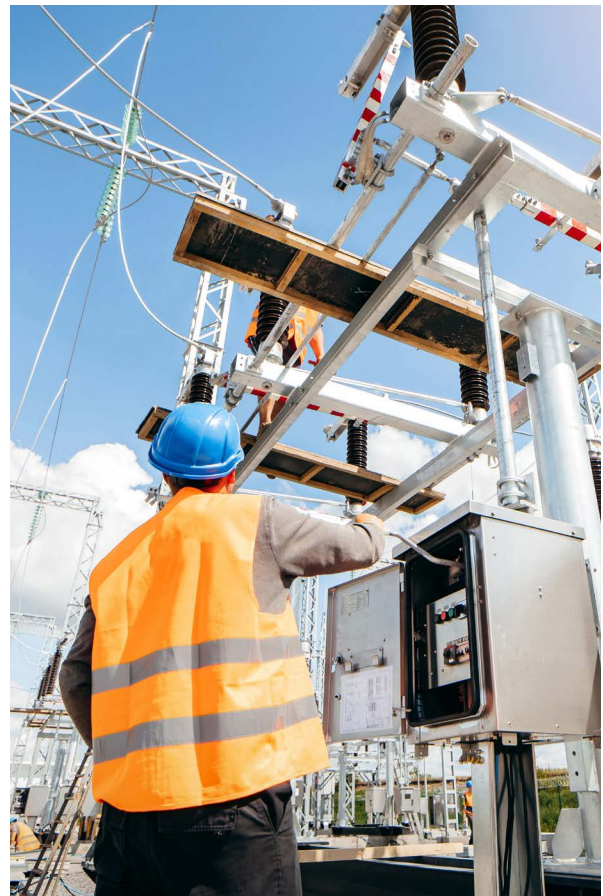
FIGURE 6. Primary Supplemental Project Drivers



(Credit: PJM, "Primary Supplemental Project Drivers," 2022 RTEP Key Maps, Tables and Figures, Slide 17, 2023).

Supplemental transmission projects are planned differently than baseline projects. With supplemental projects, PJM's staff evaluate the proposals only to determine their impact on grid reliability. Supplemental projects are exempt from PJM's competitive bidding process and do not require approval from the board.

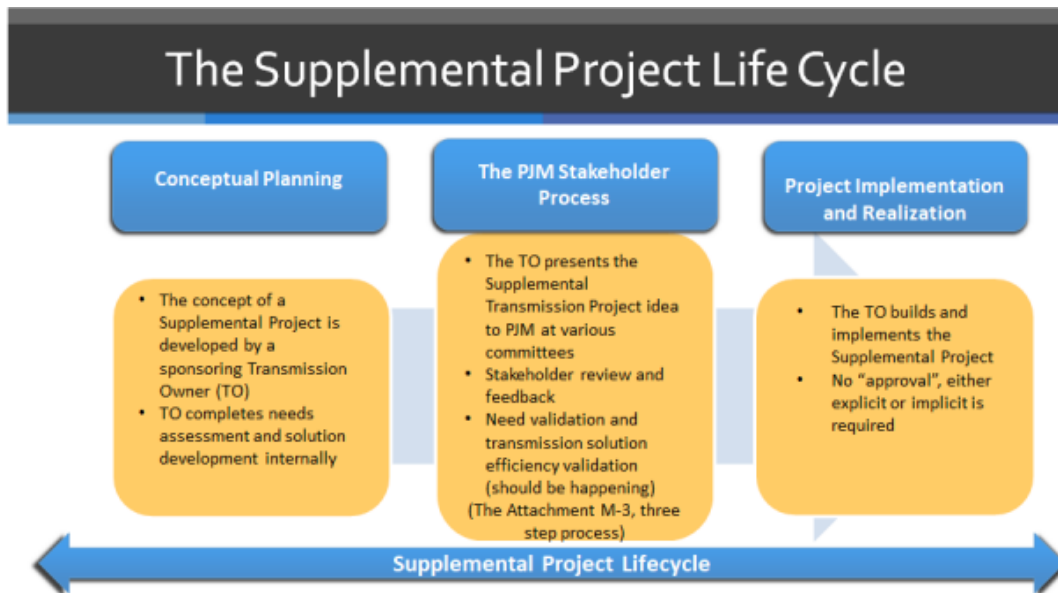
While PJM has standard policies that govern RTEP project development, the supplemental planning process may vary from state to state or utility zone to utility zone. Within PJM's stakeholder processes, Attachment M-3 to PJM's Open Access Transmission Tariff (OATT) requires transmission owners to present supplemental projects that are 230 kV and above to the Transmission Expansion Advisory Committee (TEAC) and facilities below 230 kV to the Subregional RTEP Committees (Mid-Atlantic, Southern, and Western). Stakeholders can comment on proposed supplemental projects during TEAC and Subregional RTEP Committee meetings, which at a minimum include an Assumptions Meeting, a Needs Meeting, and a Solutions Meeting.²³ Under the current rules, these meetings may be the best opportunity for advocates to comment on proposed supplemental projects; however, transmission owners have no obligation to modify their plans based on stakeholder comments.



²³ PJM, "Manual 14B: PJM Region Transmission Planning Process Section 1: Process Overview."

The standard planning process for supplemental projects is depicted below in Figure 7.

FIGURE 7. The Supplemental Project Life Cycle



(Credit: Continuum Associates, "The Supplemental Project Life Cycle," Expert Consultation on PJM Supplemental Transmission Projects: Standards and Oversight, at 11, CAPS, 2019).

Quick Recap of Regional vs. Supplemental Projects

- ▶ Supplemental Projects do not need to comply with certain transmission planning requirements and are not planned through PJM's RTEP review process.
- ▶ Proposed RTEP projects are subject to PJM review and Board approval. While PJM reviews supplemental project to determine their impact on the regional electric system, they are not subject to Board approval.
- ▶ Transmission Owners maintain control and authority over local Supplemental Projects, but PJM play a significant role in planning projects with regional impacts.
- ▶ Projects that go through the RTEP review could be regionally cost allocated and could also be subject to competition, unlike Supplemental Projects where the Transmission Owner (TO) retains the discretion to plan the Supplemental Project in its local zone and the right to add prudent projects to the TO's rate base and earn a return on the increased rate base from its customers.

(Source: GDS Associates, Inc. and McNees Wallace and Nurick LLC, "White Paper on Formula Rates and Supplemental Projects," CAPS, 2021).

A Note on Project Costs

PJM's governing documents—the Tariff, Operating Agreement, and Transmission Owners Agreement—lay out the rules governing which customers will be responsible for paying the costs of transmission expansion and upgrades, a process known as cost allocation. Federal laws require the costs be distributed in a manner “roughly commensurate” with the benefits that the customers receive. Handbook Volume VI explains how transmission project costs are allocated and charged to specific customers. Volume VII discusses how transmission operators recoup the money they spend building, operating, and maintaining transmission lines.



Advocacy Opportunities for Improved Planning

Transmission projects are a major expense and require massive investments of resources, including land, steel, and labor. These development costs are passed along to consumers in their electricity bills. It is important that all parties responsible for planning new lines proactively look for the most efficient routes and cost-effective solutions to satisfy electricity demands. Planning appropriately from the start is a major factor in minimizing consumer costs.

Multi-Value Planning: The principal way to find cost-effective solutions is through robust and proactive multi-value planning. As discussed above, PJM—like most Regional Transmission Operators (RTOs)—tends to evaluate projects by individual drivers to determine if they serve a reliability, an economic, or a public policy need. This process is often siloed, with planners failing to consider whether a single project could satisfy more than one need at the same time. Like the saying “measure twice, cut once,” multi-value planning can help PJM comprehensively plan for long-term system needs and reduce the overall cost of development. For instance, the Midcontinent Independent System Operator (MISO) started evaluating projects as part of larger portfolios that take a long-term look at electric needs in its footprint. A recent analysis found their \$10.3 billion slate of proposed transmission lines would produce benefits worth roughly \$37.3 billion — a figure more than double the cost to build them.²⁴

RTEP Process: PJM’s Regional Transmission Expansion Plan involves an open stakeholder process. A variety of entities, including PJM staff and board members, transmission and generation owners within PJM, state regulators, consumer advocates, and the independent market monitor participate in the RTEP process, which includes public meetings before PJM’s committees and subcommittees (e.g. the PJM Planning Committee, the Transmission Expansion Advisory Committee, and various subregional committees). These meetings are a forum to review recommended planning strategies, review studies on system need, and evaluate specific project proposals. To avoid garbage in, garbage out, planning processes, it is important that planning assumptions and methodologies are accurate and comprehensive. Advocates can help ensure the planning strategies that PJM uses are supportive of consumer needs.

²⁴ MISO, “LRTP Tranche 1 Portfolio Detailed Business Case,” March 29, 2022.

Supplemental Projects: This is the hardest area to engage in directly. Although transmission owners must present their proposed list of supplemental projects to PJM in TEAC and subregional RTEP meetings, there is limited review or oversight of these lists. A previous CAPS paper notes several shortcomings in this process, including that state commission staff and consumer advocates have minimal oversight into the supplemental project pipeline and often do not learn about projects until they are integrated into rate cases. PJM does not perform an independent transmission needs assessment of supplemental transmission projects, and if a project does not require a Certificate of Public Convenience and Necessity (CPCN),²⁵ there is likely to be no regulatory oversight from a state commission. Advocates should continue to push for reforms that support transparent supplemental planning processes and an integrated consideration of regional and supplemental to ensure the region is picking the most cost-effective solutions.

FERC Rulemakings and PJM Stakeholder Processes: FERC’s regulations set PJM’s “rules of the road” with respect to transmission planning and development. As such, FERC rulemakings are a good forum for advocates to shape broader planning policies. The currently pending FERC Notice of Proposed Rulemaking on Transmission Planning and Cost Allocation²⁶ proposes to modify planning processes to encourage more comprehensive long-term planning. When the final order is issued, advocates should engage in the PJM stakeholder processes that will review how PJM plans to comply with FERC’s directive.



²⁵ In some, but not all cases, transmission projects may require a CPCN from the state utility commission. See Handbook Volume V for more information on CPCNs and the transmission siting/permitting process.

²⁶ *Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection*, 179 FERC ¶ 61,028 (2022).

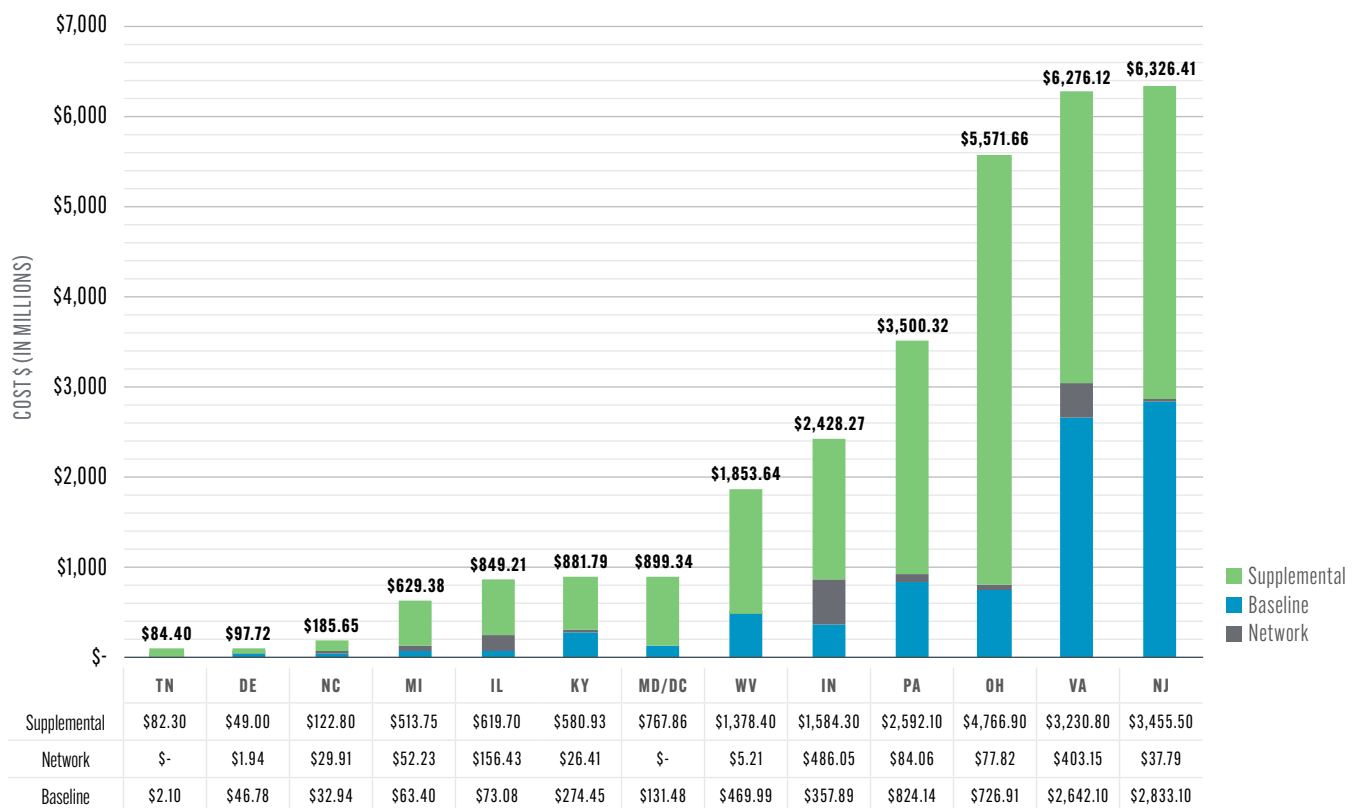


State by State Profiles of Transmission Infrastructure Investment

The following state profiles contain data collected from the 2018-2022 [PJM Annual RTEP Reports](#) and Annual State Infrastructure Reports (e.g. [2022 Delaware State Infrastructure Report](#)). Note that PJM’s public website does not provide state breakdowns prior to 2018, and 2023 data will be made available in Spring 2024.

While the charts provide a high-level comparison of system investment over time, the annual data is not fully comparable from year-to-year because PJM’s reporting methodology differs between reports. Specifically, between 2018 and 2020, PJM included only project investments greater than \$5 million in the system-wide RTEP figures, and project investments greater than \$10 million in the State Infrastructure Reports.¹ As of 2021, however, PJM removed these thresholds and started listing all transmission projects in its annual RTEP and state infrastructure reports.² Due to these reporting practice changes, the data after 2022 captures a wider net of projects than the prior years.

Total PJM RTEP Transmission Project Costs by Type and by State, 2018-2022



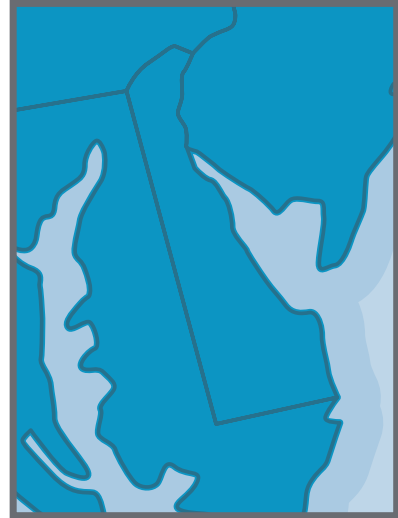
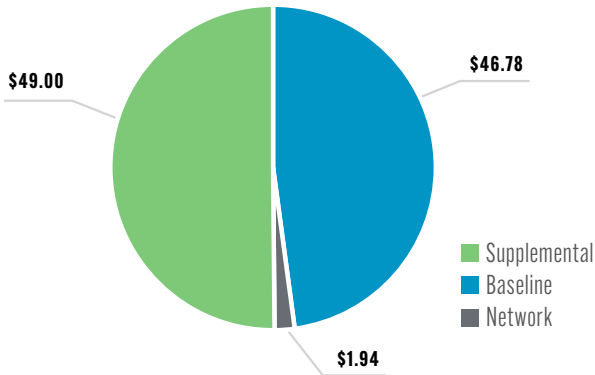
¹ See, e.g., PJM, “2020 Delaware State Infrastructure Report,” at 15, 2021; PJM, “2019 Delaware State Infrastructure Report,” at 16, 2020; PJM, “2018 Delaware State Infrastructure Report,” at 33, 2019.

² See, e.g., PJM, “2022 Delaware State Infrastructure Report,” at 13, 2023; PJM, “2021 Delaware State Infrastructure Report,” at 15, 2022.

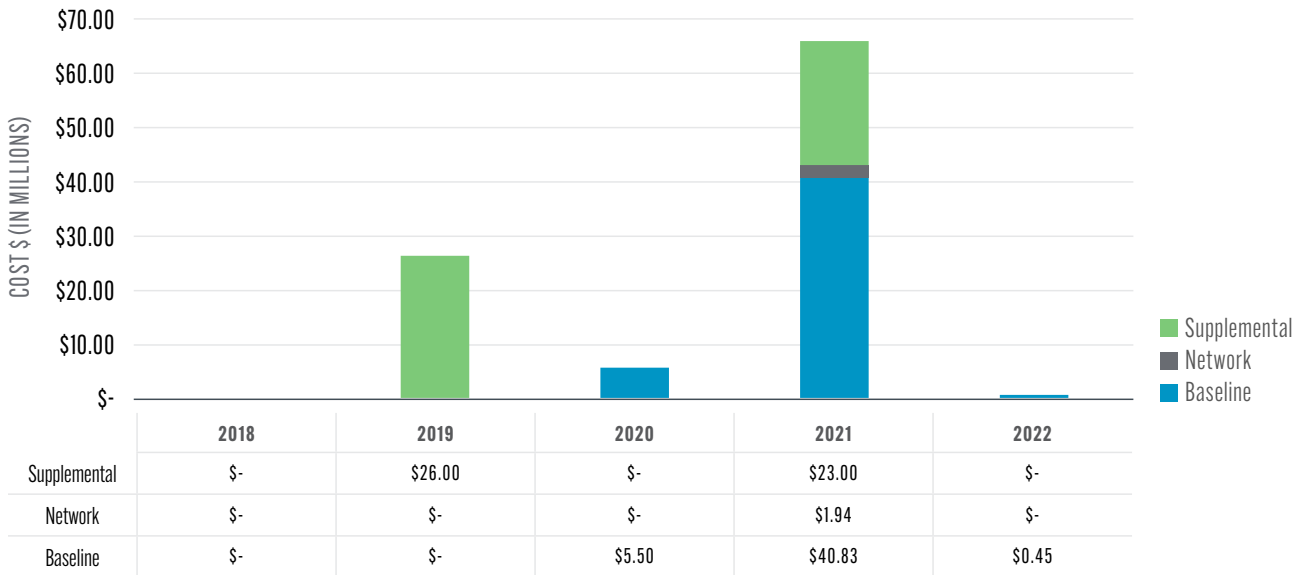
DELAWARE

Transmission Owner Zone: Delmarva Power & Light Co. (DP&L)

Delaware | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



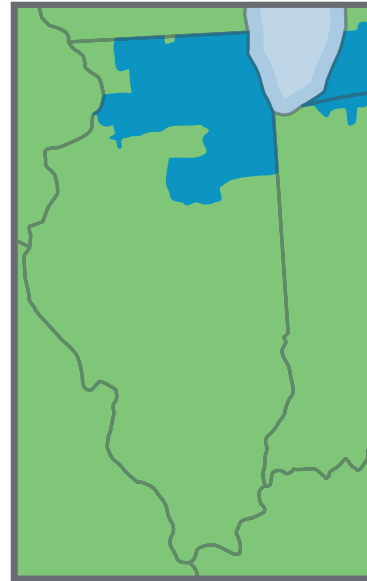
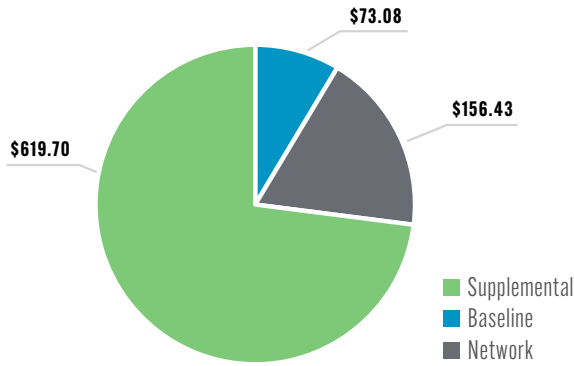
Delaware | Total PJM Transmission Project Cost in RTEP by Type and Year



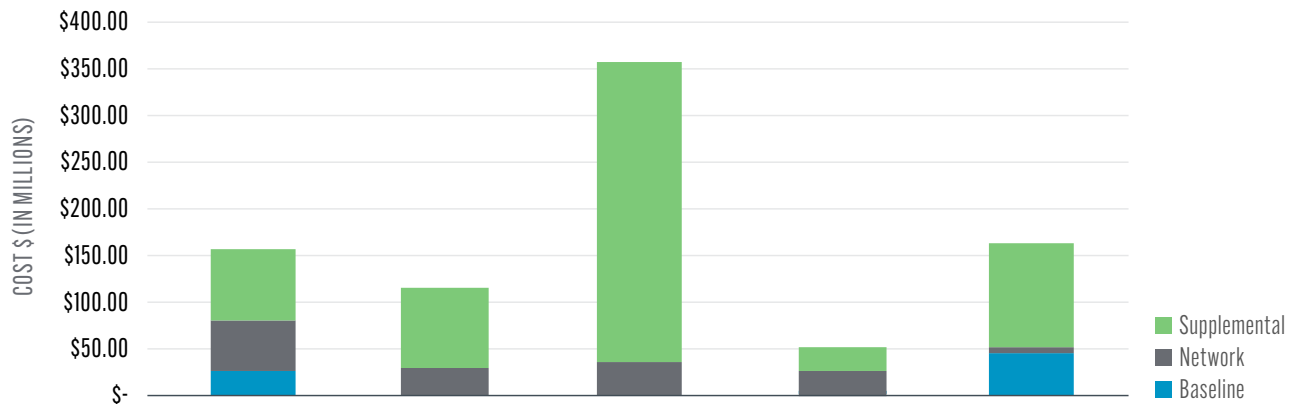
ILLINOIS

Transmission Owner Zone: Commonwealth Edison Company (ComEd)

Illinois | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



Illinois | Total PJM Transmission Project Cost in RTEP by Type and Year

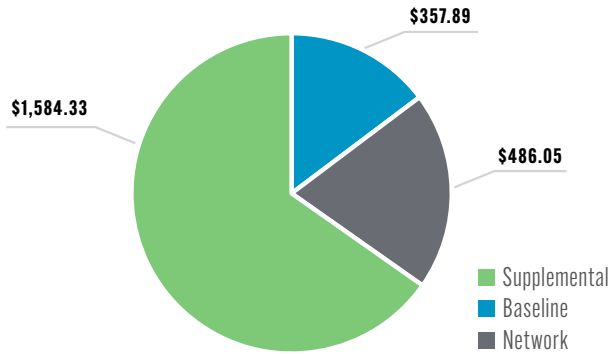


	2018	2019	2020	2021	2022
Supplemental	\$77.20	\$83.00	\$320.80	\$27.00	\$111.70
Network	\$56.00	\$32.15	\$35.67	\$25.69	\$6.92
Baseline	\$26.00	\$-	\$-	\$0.26	\$46.82

INDIANA

Transmission Owner Zone: American Electric Power (AEP)

Indiana | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



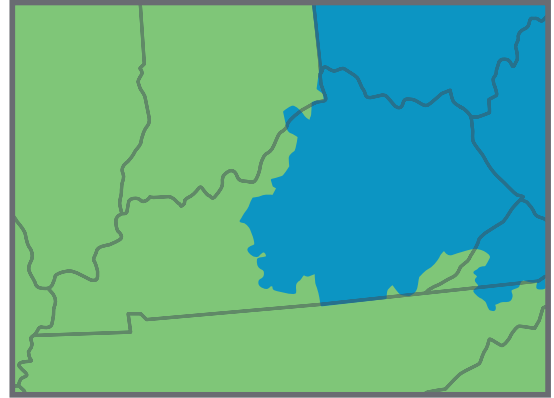
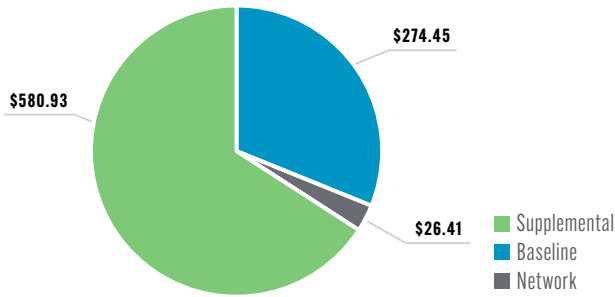
Indiana | Total PJM Transmission Project Cost in RTEP by Type and Year



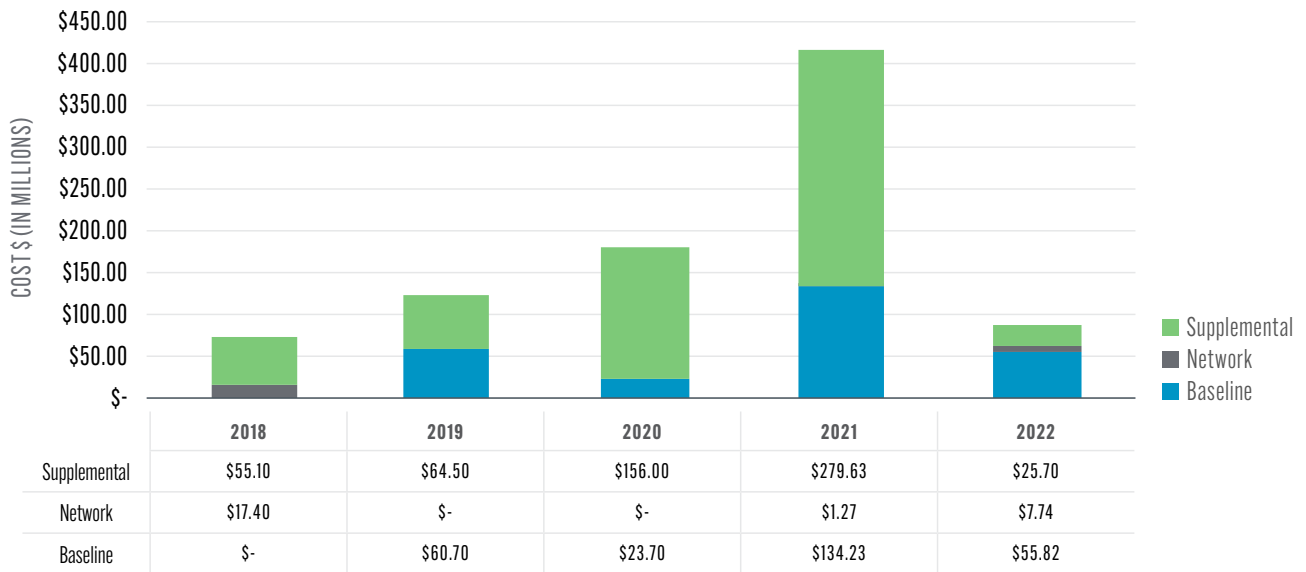
KENTUCKY

Transmission Owner Zones: American Electric Power (AEP), Duke Energy Ohio and Kentucky Corp. (DEO&K), East Kentucky Power Cooperative (EKPC)

Kentucky | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



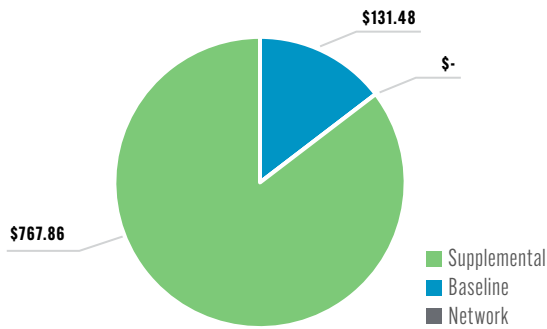
Kentucky | Total PJM Transmission Project Cost in RTEP by Type and Year



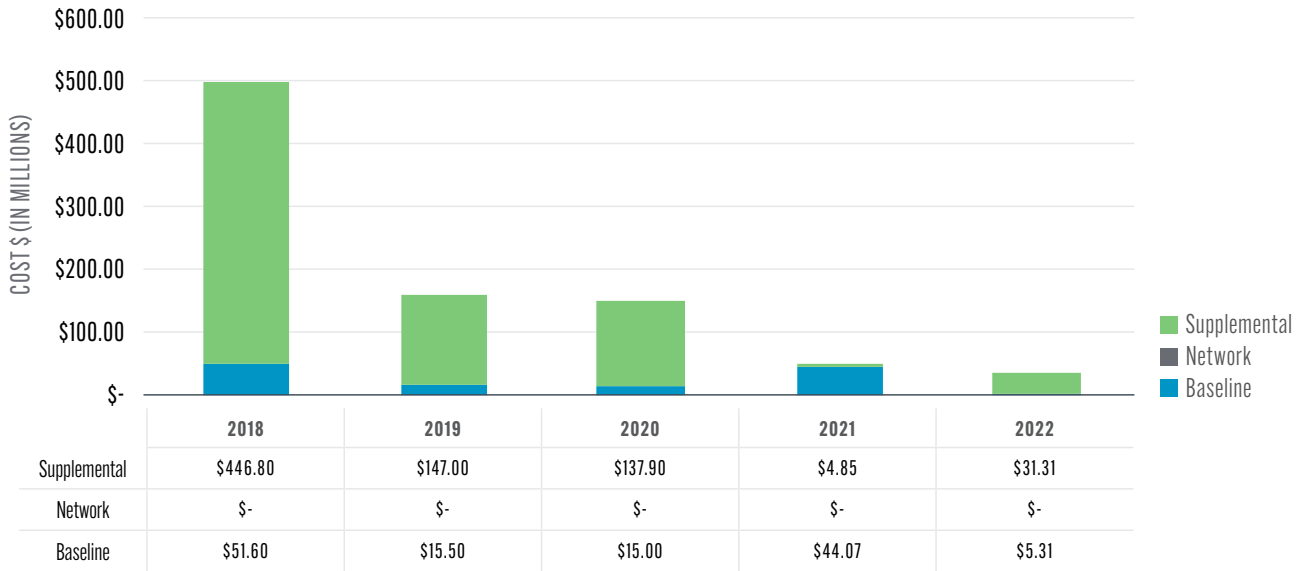
MARYLAND/DC

Transmission Owner Zones: Allegheny Power Systems (AP), Baltimore Gas and Electric Co. (BGE), Delmarva Power & Light Co. (DP&L), Potomac Electric Power Co. (PEPCO)

Maryland & DC | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



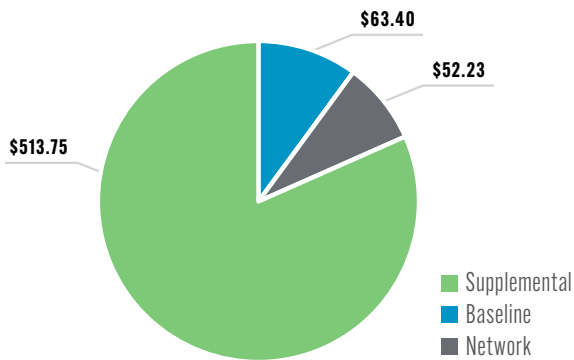
Maryland & DC | Total PJM Transmission Project Cost in RTEP by Type and Year



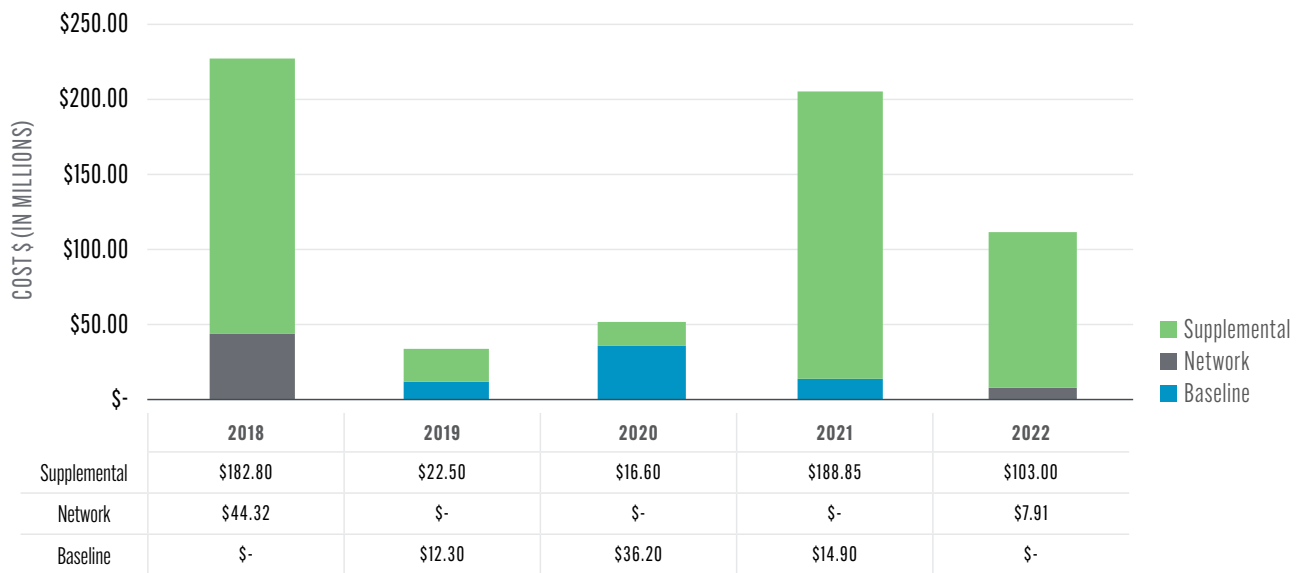
MICHIGAN

Transmission Owner Zone: American Electric Power (AEP)

Michigan | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



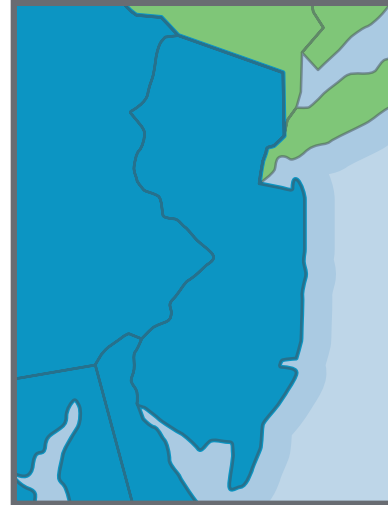
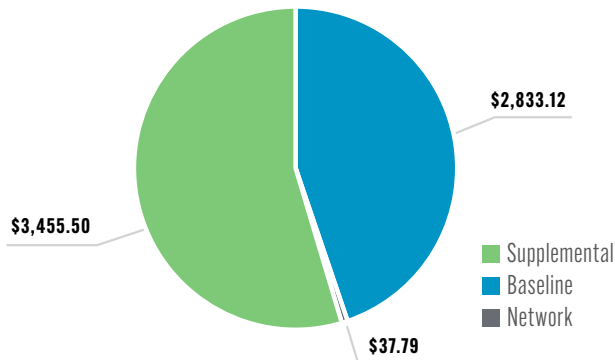
Michigan | Total PJM Transmission Project Cost in RTEP by Type and Year



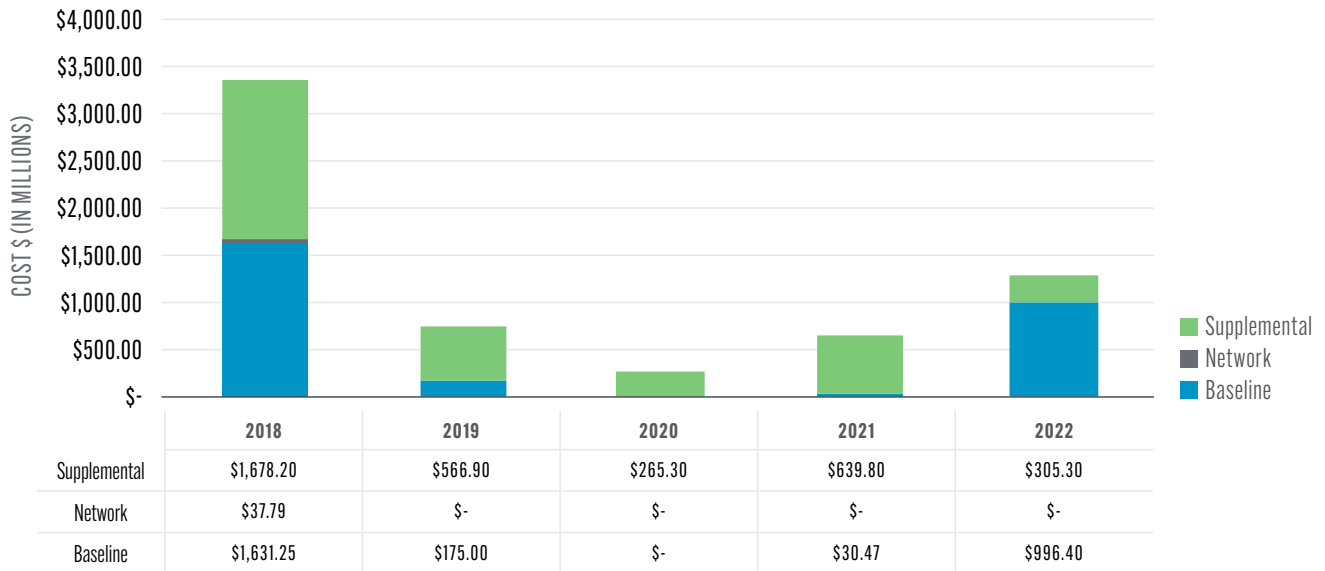
NEW JERSEY

Transmission Owner Zones: Atlantic City Electric Co. (AE), Jersey Central Power & Light (JCP&L), PSEG (PSEG), Rockland Electric Co. (RECO)

New Jersey | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



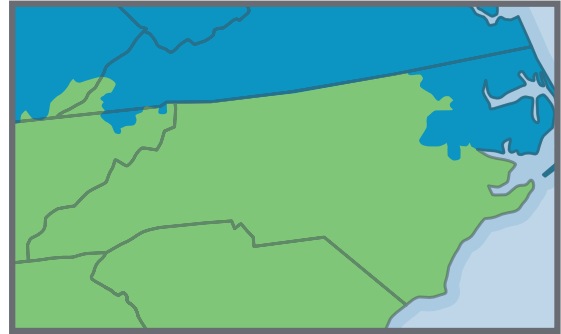
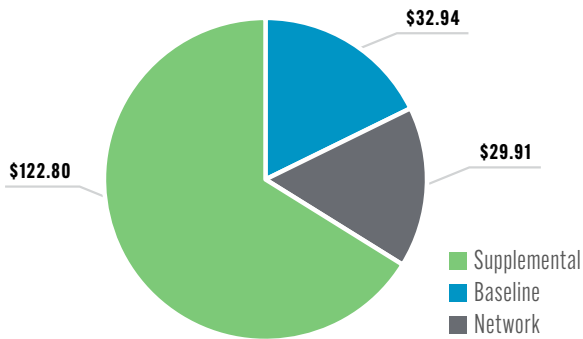
New Jersey | Total PJM Transmission Project Cost in RTEP by Type and Year



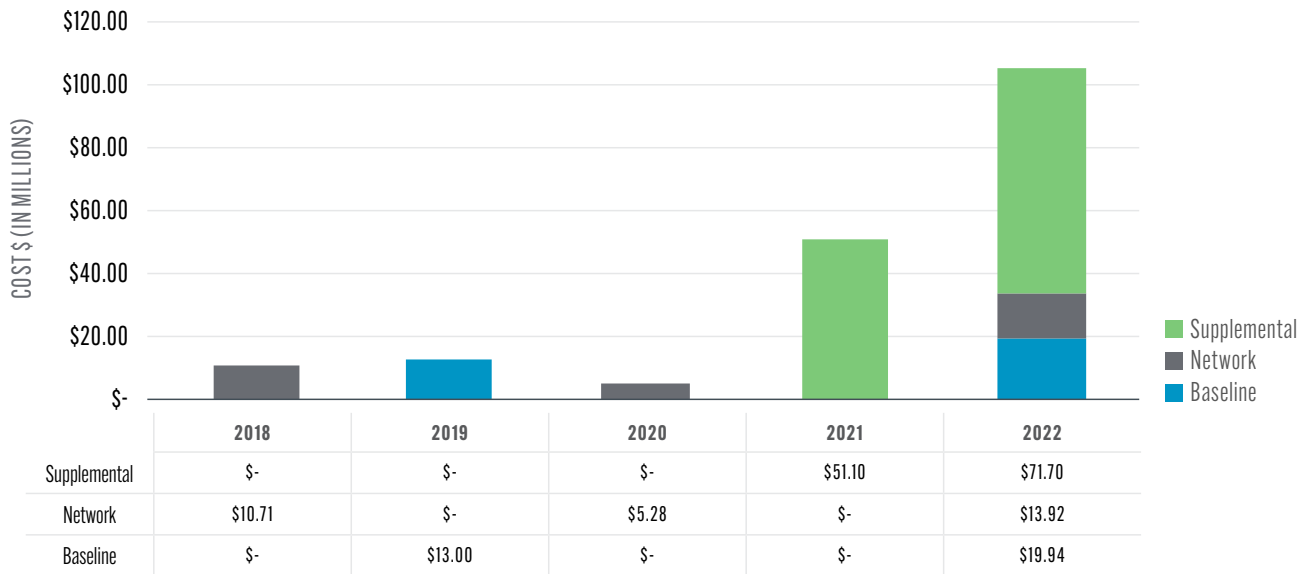
NORTH CAROLINA

Transmission Owner Zone: Dominion (Dominion)

North Carolina | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



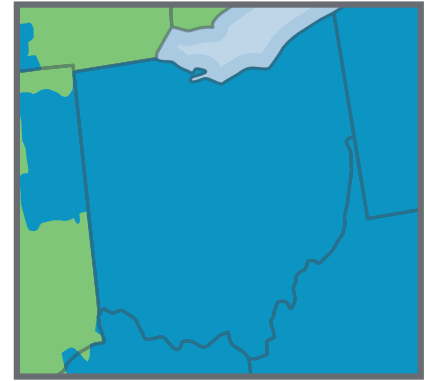
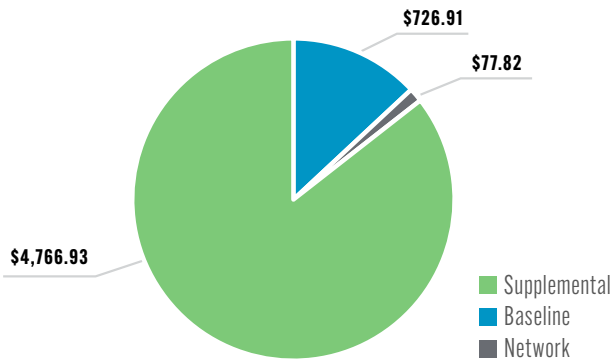
North Carolina | Total PJM Transmission Project Cost in RTEP by Type and Year



OHIO

Transmission Owner Zones: American Electric Power (AEP), American Transmission Systems, Inc. (ATSI), Dayton Power & Light Co. (DAY), Duke Energy Ohio and Kentucky Corp. (DEO&K), Ohio Valley Electric Corp. (OVEC)

Ohio | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



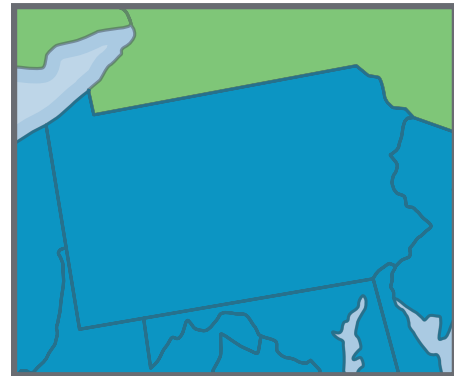
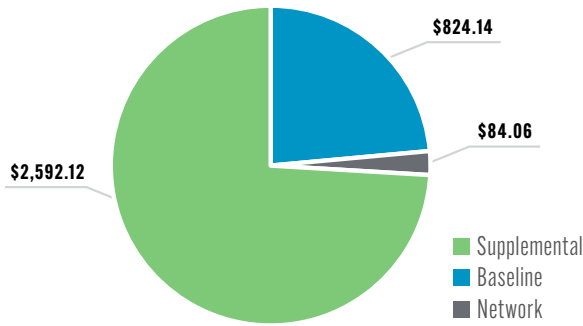
Ohio | Total PJM Transmission Project Cost in RTEP by Type and Year



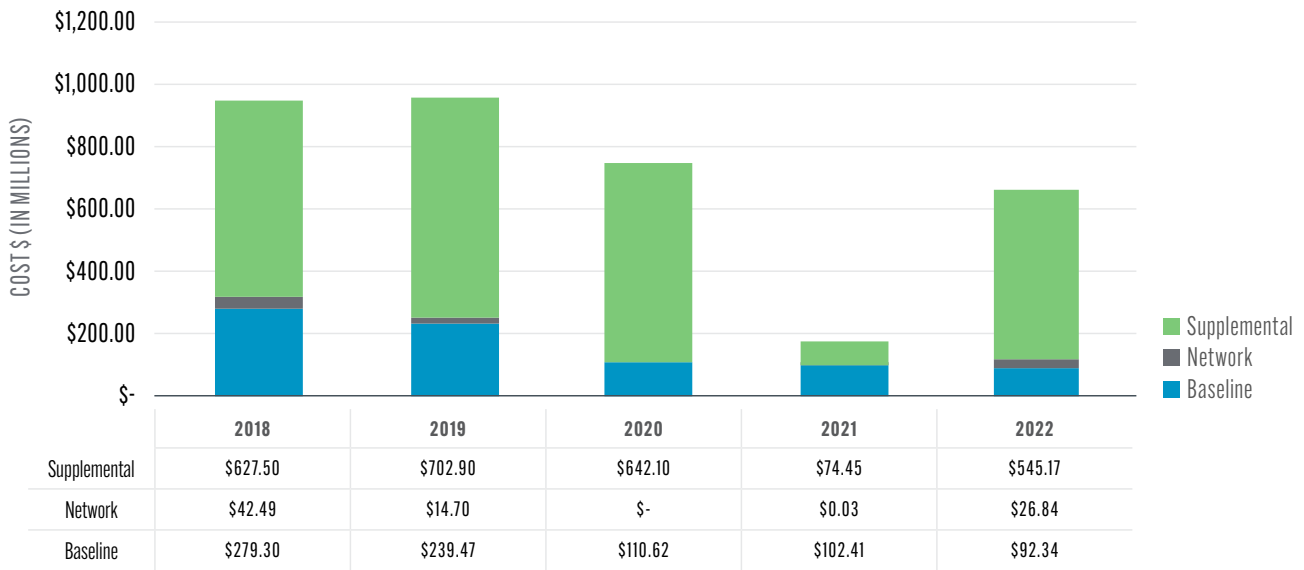
PENNSYLVANIA

Transmission Owner Zones: Duquesne Light Co. (DLCO), Met-Ed (METED), Pennsylvania Electric Co. (PENELEC), PECO Energy Co. (PECO), PPL Electric Utilities (PPL)

Pennsylvania | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



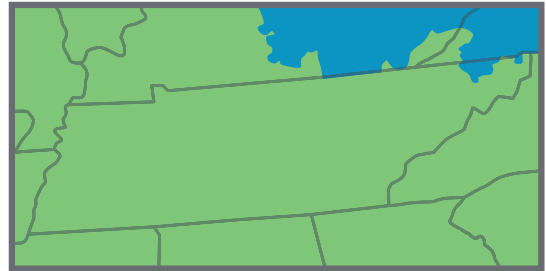
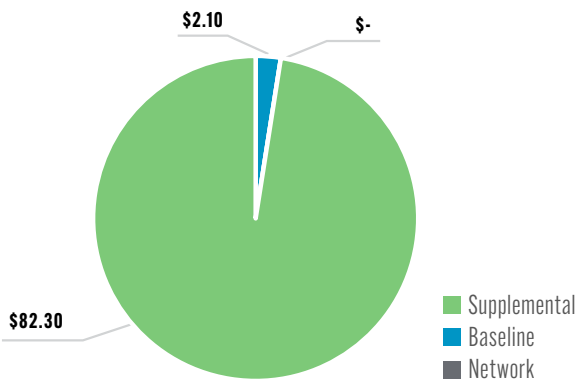
Pennsylvania | Total PJM Transmission Project Cost in RTEP by Type and Year



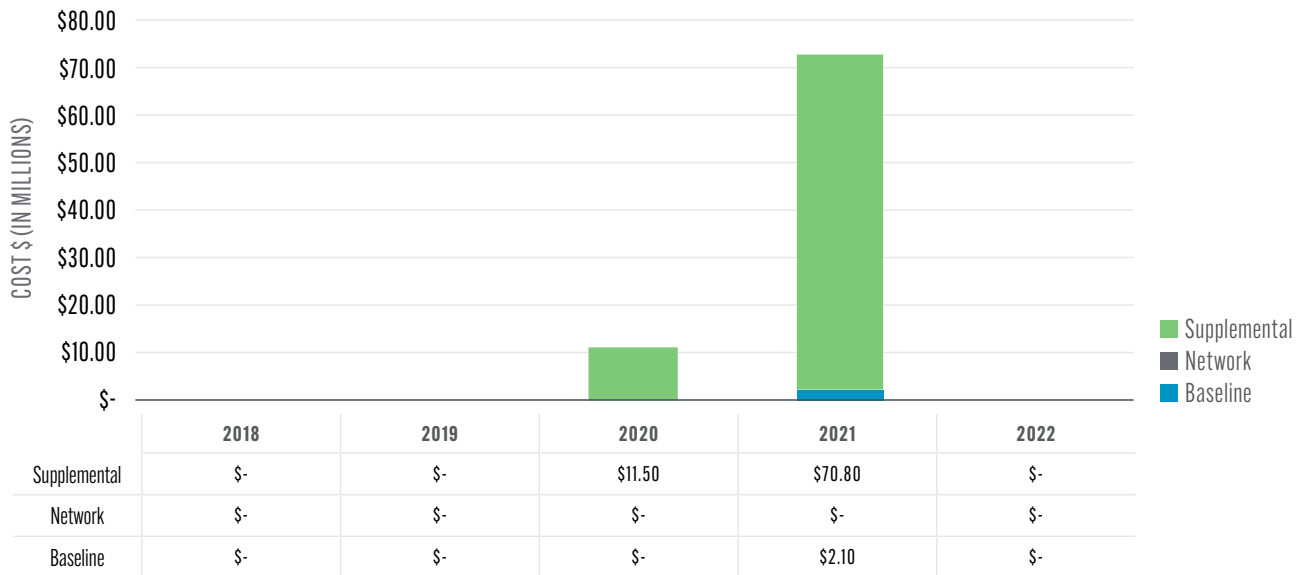
TENNESSEE

Transmission Owner Zone: American Electric Power (AEP)

Tennessee | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



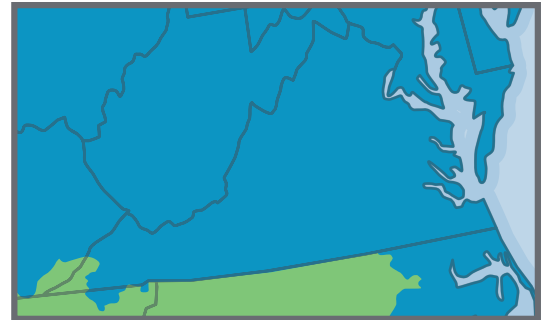
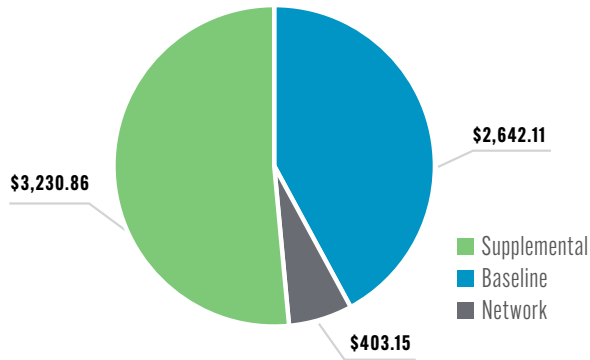
Tennessee | Total PJM Transmission Project Cost in RTEP by Type and Year



VIRGINIA

Transmission Owner Zones: Allegheny Power Systems (AP), American Electric Power (AEP), Dominion (Dominion)

Virginia | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



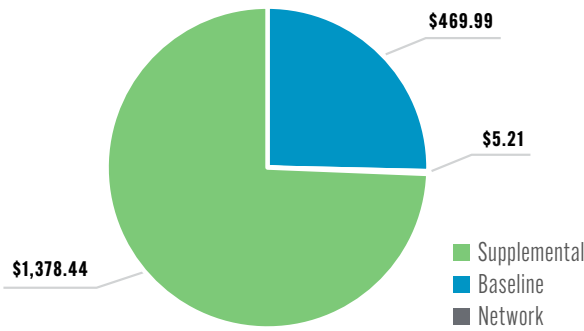
Virginia | Total PJM Transmission Project Cost in RTEP by Type and Year



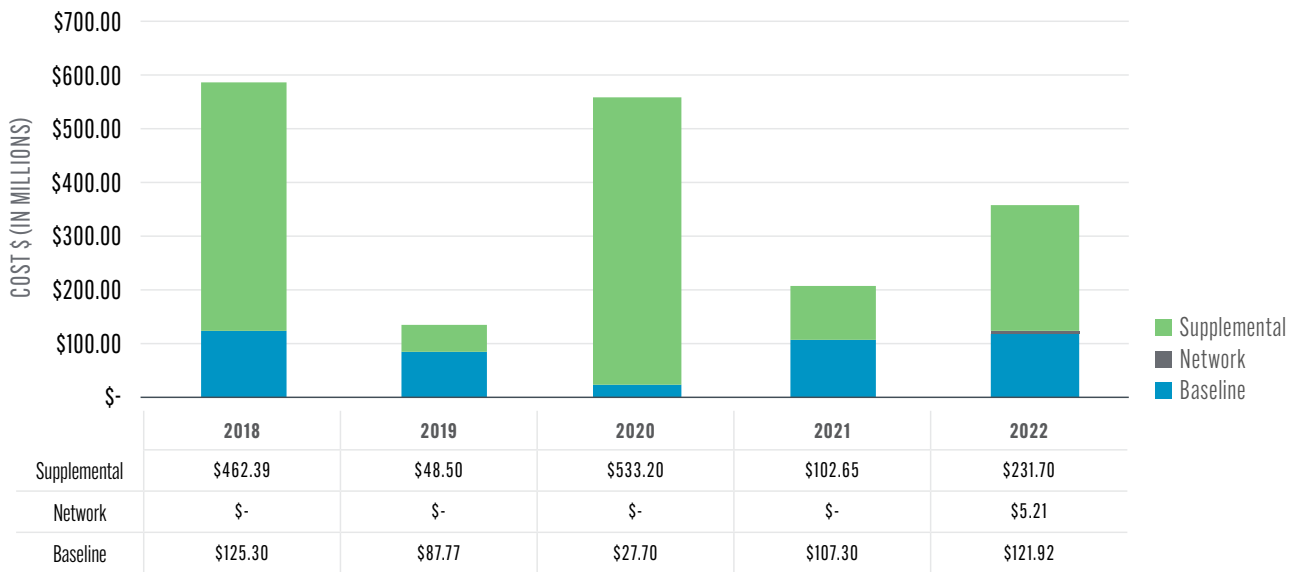
WEST VIRGINIA

Transmission Owner Zones: Allegheny Power Systems (AP), American Electric Power (AEP)

West Virginia | Total PJM Transmission Project Cost in RTEP by Type, 2018-2022 (in millions)



West Virginia | Total PJM Transmission Project Cost in RTEP by Type and Year



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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DGA Report Team: Anjali Patel, Hannah Schuster, Will Sherman, and Anna Stern

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