Analysis of Delaware's Electricity Distribution Grid Interim Project Report: Baseline Conditions Assessment

Preliminary Progress Report to the Delaware Governor and General Assembly detailing the initial findings from the analysis of grid-enhancing technologies pursuant to House Joint Resolution 3

Prepared for
Delaware Department of Natural Resources and Environmental Control

Submitted
December 17, 2025

siemens-energy.com

Table Of Contents

List of Figures

List of Tables

List of Acronyms

ADMS	Advanced Distribution Management System
AMI	Advanced Metering Infrastructure
ATI	Approval to Install
BRA	Base Residual Auction (PJM capacity market)
BTM	Behind-the-Meter
BYOB	Bring-Your-Own-Battery
C&I	Commercial and Industrial

CONE	Cost of New Entry
CSP	Curtailment Service Provider
CVR	Conservation Voltage Reduction
DAC	Disadvantaged Community
DEC	Delaware Electric Cooperative
DEMEC	Delaware Municipal Electric Corporation
DESEU	Delaware Sustainable Energy Utility
DER	Distributed Energy Resource
DERMS	Distributed Energy Resource Management System
DNREC	Delaware Department of Natural Resources and Environmental Control
DPL	Delmarva Power and Light
DR	Demand Response
EDC	Electric Distribution Company
EE	Energy Efficiency
EIA	U.S. Energy Information Administration
EV	Electric Vehicle
FERC	Federal Energy Regulatory Commission
GDP	Gross Domestic Product
GEAC	Governor's Energy Advisory Committee
GET	Grid Enhancing Technology
GW	Gigawatt
HJR3	House Joint Resolution 3
ISR	Infrastructure, Safety, and Reliability (Plan)
LDR	Locational Demand Response
LMP	Locational Marginal Price
LRDP	Long Range Distribution Plan
MED	Major Event Day
MW	Megawatt
MWh	Megawatt-hour
NDA	Non-Disclosure Agreement
NWA	Non-Wires Alternative
OMS	Outage Management System
PJM	PJM Interconnection (regional transmission organization)
PSC	Public Service Commission
QWP	Quarterly Work Plan
REPSA	Renewable Energy Portfolio Standards Act

RFI	Request for Information
RPS	Renewable Portfolio Standard
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SEO	State Energy Office
SEP	State Energy Plan
SESP	State Energy Security Plan
SLD	Single Line Diagram
ToU	Time-of-Use (rates)
USDOE	United Stated Department of Energy
TYF	Ten-Year Forecast
TWh	Terawatt-hour
V2G	Vehicle-to-Grid

Release	Name	Contact	Signature
Editor	Alok Patil	alok.patil@siemens-energy.com	
Reviewer	Joshua Brooks	Joshua.brooks@siemens-energy.com	

Revisions	Date issued	Comments
0	12/10/2025	First draft
1	12/17/2025	First revised draft
2	12/18/2025	Second revised draft

Executive Summary

This interim Baseline Conditions Assessment delivers a system-wide view of Delaware's electric distribution grid across Delmarva Power and Light (DPL), Delaware Electric Cooperative (DEC), and the Delaware Municipal Electric Corporation (DEMEC) to support DNREC's grid modernization and resilience objectives. The preliminary report is designed to fulfill the mandate of House Joint Resolution 3 (HJR3) for the Department of Natural Resources and Environmental Control (DNREC) State Energy Office (SEO) and Delaware Sustainable Energy Utility (DESEU) to submit initial findings from the analysis of grid-enhancing technologies across all electric utilities in Delaware. The report characterizes each EDC's system topology, reliability, customer programs, distributed energy resource (DER) adoption, and planning practices, and evaluates whether the data currently available is sufficient to support the originally proposed detailed modeling and cost-benefit analysis envisioned in the state's legislative mandate and RFP.

Statewide, load growth has been relatively flat but is expected to accelerate due to large new customers, including a proposed 1.2 GW data center, electrification trends, and pursuit of a renewable portfolio standard (RPS) target of 40% renewables by 2035. Delaware generates about 9% of its energy from renewables today. In 2024, DPL served about 61% of customers and delivered about 51% of the state's energy sales over 273 circuits. DEC served roughly 24% of customers and delivered 21% of sales on 91 circuits. And DEMEC's nine municipal members served about 16% of customers and delivered 28%, over more than 100 circuits. Locational marginal prices (LMPs) within the state show a persistent differential between northern and southern zones, reflecting transmission topology and the location of major generators and loads. The observed price spread is consistent across the energy, congestion, and loss components of LMPs. Reliability performance is generally strong and improving, while DEC and top DEMEC members outperform national medians on demand response and DER penetration relative to peak load.

This interim report reflects the first substantial portion of work completed toward the Analysis of Delaware's Electricity Distribution Grid which in addition to fulfilling HJR3 will also inform how the DNREC SEO will implement the remaining portion of the United States Department of Energy (USDOE) grant provided pursuant to the Bipartisan Infrastructure Law Section 40101(d). The success of the remainder of the analytical work relies heavily on the availability of confidential information from each of the state's EDCs, which has been thus far withheld, most notably power flow models and cybersecurity policy and practices information. In the absence of this information, Siemens Energy recommends pivoting to a high-level, qualitative assessment which advances planning, policy, and program design, while clearly documenting data gaps, alternative methods, and a strategic roadmap for the future of Delaware's electricity distribution grid. Siemens Energy will deliver Delaware with an objective assessment of how the state's electricity distribution grid may be made more reliable, resilient and DER deployable through various projects and programs.

Highlights

- Electricity demand growth is expected to accelerate due to new large loads and electrification.
- Reliability is improving while Demand Response, Energy Efficiency, and Distributed Energy Resources play growing roles.
- All utilities are advancing grid-enhancing technologies and modernizing infrastructure.
- Data gaps prevent detailed modeling, limiting estimation precision of costs and benefits of grid enhancing technologies and requiring a higher-level approach.

1. Introduction

This Baseline Conditions Analysis is prepared in response to the requirements set forth in the Delaware Department of Natural Resources and Environmental Control (DNREC) Request for Proposal NAT41172-EGS, which calls for a comprehensive statewide assessment of the electricity distribution grid across all Delaware electric utilities. The analysis aims to characterize the current state of each of Delaware's Electric Distribution Companies (EDC), focusing on their approaches to distribution system planning, load forecasting, distributed energy resource (DER) adoption, asset management, performance assessment, and investment drivers. Additionally, this report will provide an overview of the data collected from the EDCs to date and communicate preliminary feasibility estimates of the outcomes required by HJR3, which was signed by Governor Meyer on July 16, 2025.

Key RFP Requirements

- Statewide analysis of baseline conditions for each Delaware EDC.
- Description of each EDC's approach to distribution system planning, including load forecasting, DER adoption, asset management, and performance assessment.
- Characterization of distribution systems with descriptive narratives, topographic maps, and summary statistics (e.g., customer classes, voltage levels, DERs, circuit types, substations, innovative technologies).
- Satisfy the requirements of HJR3 which requires a characterization of the relative opportunities of various grid enhancing technologies to bolster the safety, resilience and reliability of the electricity grid while promoting electricity affordability for Delaware citizens.
- Utilize the recommendations regarding grid modernization within the State Energy Plan, the long-range distribution plans created by the state's EDCs, and any results from grants issued in the DNREC SEO 40101(d) program to inform the future implementation of 40101(d) and any subsequent state investment or legislation addressing grid enhancing technologies.

Purpose of the Baseline Conditions Report

This report provides a comprehensive summary of baseline system conditions for each of the three Delaware EDCs to support the statewide grid modernization and resilience effort and serves to:

- Provide a clear, data-driven overview of Delaware's electricity distribution systems.
- Present an overview of each EDC's approach to distribution planning, including methodologies for load and DER growth forecasting, asset management, and performance assessment.
- Summarize and communicate the data collected from EDCs, highlighting both the availability and limitations of data for the analyses and outcomes required by HJR3 and the RFP.
- Establish the feasibility of conducting the analyses and achieving the outcomes outlined in the legislative mandate and RFP

Organization of the Baseline Conditions Report

This report is organized into the following six sections:

- Section 1: Introduction

- Section 2: Methodology and data sources
- Section 3: Overview of Delaware's wholesale electricity system
- Section 4: EDC profiles
- Section 5: Key Insights
- Section 6: Project status update

2. Methodology and Data Sources

The report employed the following methodology to collect, visualize and present baseline conditions.

Review of Existing Plans and Reports

The analysis began with a comprehensive review of existing documents, including:

- Delmarva Power & Light (DPL) Annual Update 2024 - Infrastructure, Safety, and Reliability (ISR) Plan
- DPL annual interconnection reports for 2023, and 2024
- Planning documents provided by Delaware Electric Cooperative (DEC), and Delaware Municipal Electric Corporation (DEMEC)
- The State Energy Security Plan (SESP) to understand Delaware's emergency response framework and energy security priorities
- 40101(d) grant program applications
- The State Energy Plan's recommendations and strategies

EDC Engagement

Key stakeholders within each EDC were identified and engaged through interviews and Requests for Information (RFI). These interactions provided qualitative insights into current distribution system planning practices, operational challenges, and opportunities for improvement. Data requests were issued to both regulated and non-regulated EDCs to obtain detailed infrastructure and performance metrics.

Table 1. Key EDC engagements

Date	EDC	Discussion Topics
11/05/2025	DPL and DEC	Program Kick-off
11/06/2025	DEMEC	Program Kick-off
11/10/2025	DEC	Customer programs
11/17/2025	DEC	Distribution Planning
12/04/2025	DPL	Data Access
12/08/2025	DEC	Data Access
12/09/2025	DEMEC	Data Access
12/09/2025	DPL	Data Access

Public Data Sources

Public data was collected and organized from FERC, EIA, and PJM, including service territory boundaries, customer classifications, DER adoption, circuit types, substation locations, and system performance. Siemens Energy (SE) utilized Python and Excel for data visualization, creating topographical maps and dashboards to highlight key system characteristics.

Publicly available data was collected from:

- FERC Form 1
- U.S. Energy Information Administration (EIA) Form 850 and 851
- PJM Interconnection
- EIA Energy Atlas
- U.S. Census Bureau and Department of Labor (for demographics and GDP)
- RPS and MRPS compliance reports
- Delaware Public Service Commission (DE PSC) Dockets 24-1012, 25-0858, 25-1555

3. Overview of Delaware's Electricity System

Delaware's wholesale electric system today is characterized by relatively flat historic load growth, heavy reliance on imported natural-gas-fired energy, PJM region-wide projections for accelerated load growth and resource inadequacy and rapidly emerging policy drivers that will push both demand and supply, including clean energy deployment, higher over the next decade.

Electricity Demand

Delaware's 2024 coincident summer peak load was about 4.1 GW, compared with a winter peak load of roughly 3.1 GW.[1] Total load has been broadly stable over the last several years when viewed at the statewide level. Individual utilities show modest year-to-year variation but no structural shift in peak magnitude between 2020 and 2024. Table 2 below summarizes the non-coincident peaks by electric distribution company (EDC) between 2020 and 2024. **Note: In some cases, DPL data as reported in EIA-861 does not differentiate between Delaware and Maryland service territories. In these cases, the reported value for DPL across both states is provided and identified as such in the footnotes.**

Table 2. Delaware EDC's peak load 2020-2024 [2].

	2020	2021	2022	2023	2024
Summer Peak Load (MW)					
Delmarva Power [3]	4,029	3,950	4,069	4,022	4,130
Delaware Electric Cooperative	415	410	405	438	460
City of Dover	156	165	157	162	164
Town of Middletown	61	63	63	65	69
City of Milford	49	51	52	51	55
City of Newark	86	89	92	94	88
Winter Peak Load (MW)					
Delmarva Power [3]	3,136	3,179	3,538	3,599	3,523
Delaware Electric Cooperative	310	310	378	400	368
City of Dover	104	104	108	113	113
Town of Middletown	60	54	59	46	53
City of Milford	38	39	43	43	45
City of Newark	56	57	59	69	57

[1] PJM
[2] EIA Form 861
[3] Includes DPL DE and MD. DPL has advised that DE is approximately 63.5% of DPL total load.

Looking ahead, Delaware is poised for a period of significantly faster load growth driven by large new customers and emerging state policy. Most notably, a proposed data center project "Starwood Digital Ventures" near Delaware City may add up to 1.2 GW [4] of new load to the existing system. The 2024-2028 Delaware's State Energy Plan explicitly anticipates higher electricity demand from building electrification, electric vehicles, and other end uses, and calls out the need to prepare "transmission lines and substations to integrate the increasing use of renewable resources" and to "modernize Delaware's distribution networks to integrate distributed energy resources and non-wires alternatives." This trend is also reflected in PJM's RTO Summer Peak Demand Forecast, as shown in Figure 1. This forecast has been revised upwards every year since 2023 [5].

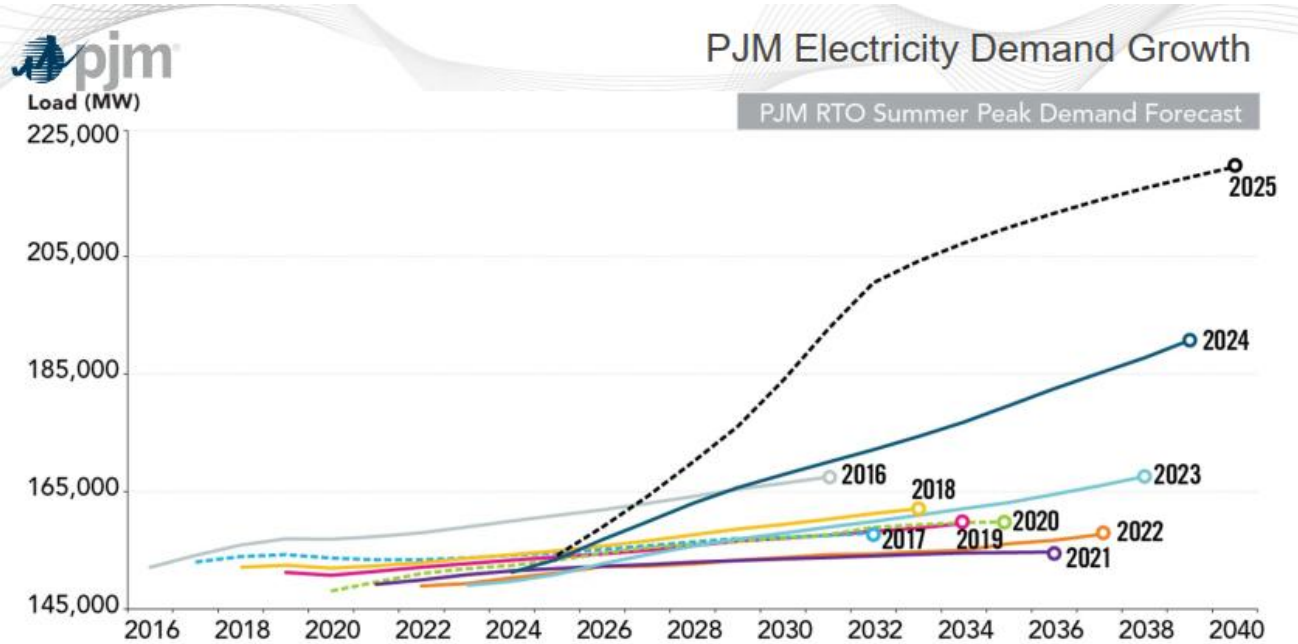

Figure 1. PJM RTO summer peak demand forecast [5].

Figure 2 shows Delaware's net generation and imports for all sectors from 2015 to 2024. Notably, the state annually imports about 60% of its electricity needs. Within the state, natural gas is the dominant power generation fuel, accounting for more than 80% of in-state electricity net generation. Coal's contribution has fallen from roughly 46% of net generation in 2010 to about 3% in 2024, and the retirement of the 411 MW coal-fired Indian River Generating Station in 2025 has removed nearly all remaining coal from Delaware's capacity stack. **Note: 2024 import data is not yet publicly available.**

[4] New Castle County, DE Webpage
[5] PJM 2024 Delaware State Infrastructure Report (January 1, 2024 – December 31, 2024), June 2025

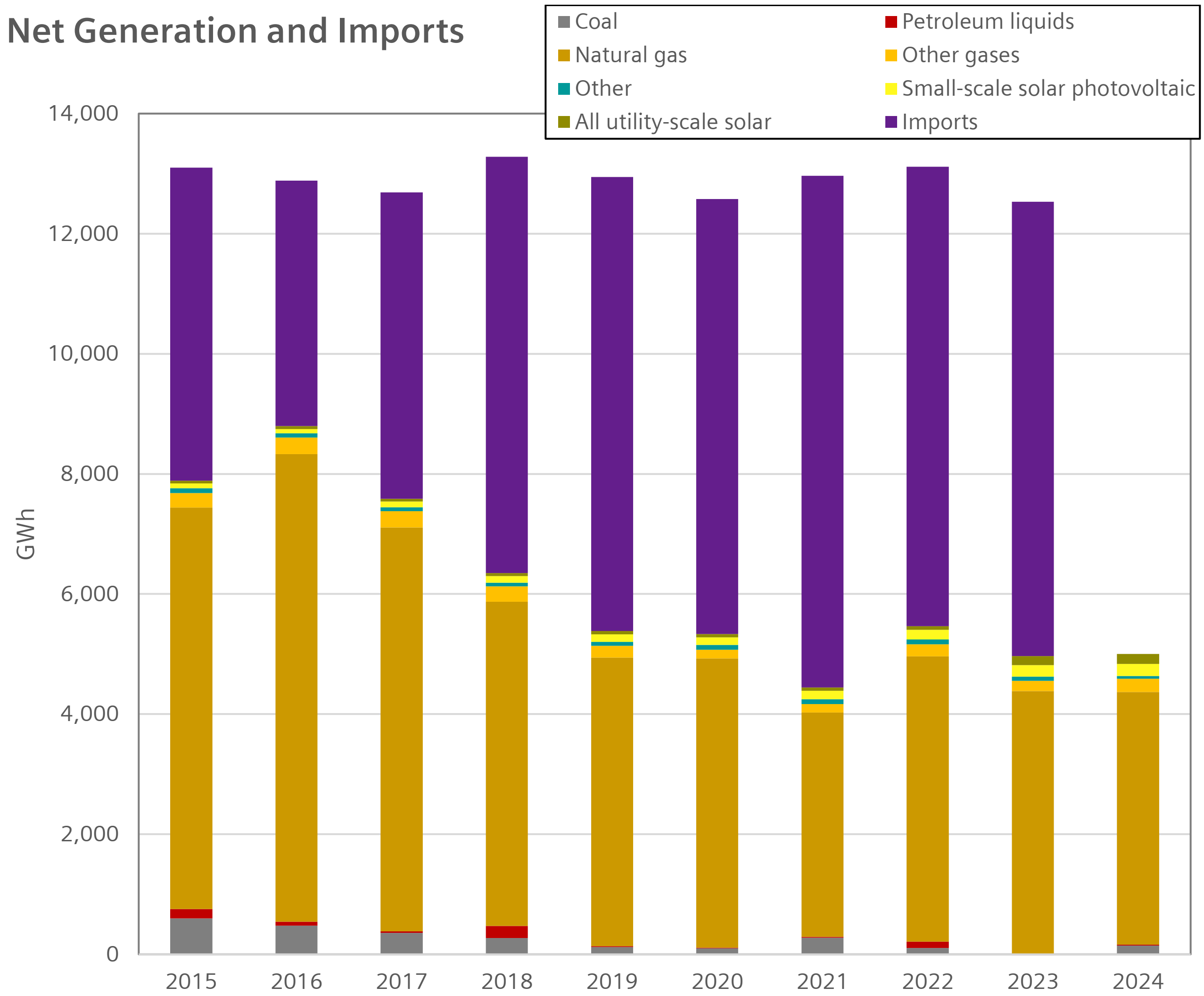

Figure 2. Delaware net generation and imports for all sectors (2015-2024) [6].

Electricity Generation

Figure 3 shows Delaware's installed generation capacity from 2015 to 2024. The state has experienced a 44% decline in installed generation capacity since 2016. 84% of the currently installed capacity is natural gas-fired generation. Delaware's clean-energy policy is anchored by its Renewable Portfolio Standard (RPS), codified in the state's Renewable Energy Portfolio Standards Act (REPSA). Statute and recent amendments require that 40% of electricity retail sales come from renewable resources by 2035, with at least 10% from solar energy. In 2024, about 9% of in-state net generation came from renewables, with solar making up roughly 8% of total generation, meaning the state is at an early stage on its trajectory toward its 2035 target.

[6] EIA 860. 2024 imports data not available yet.

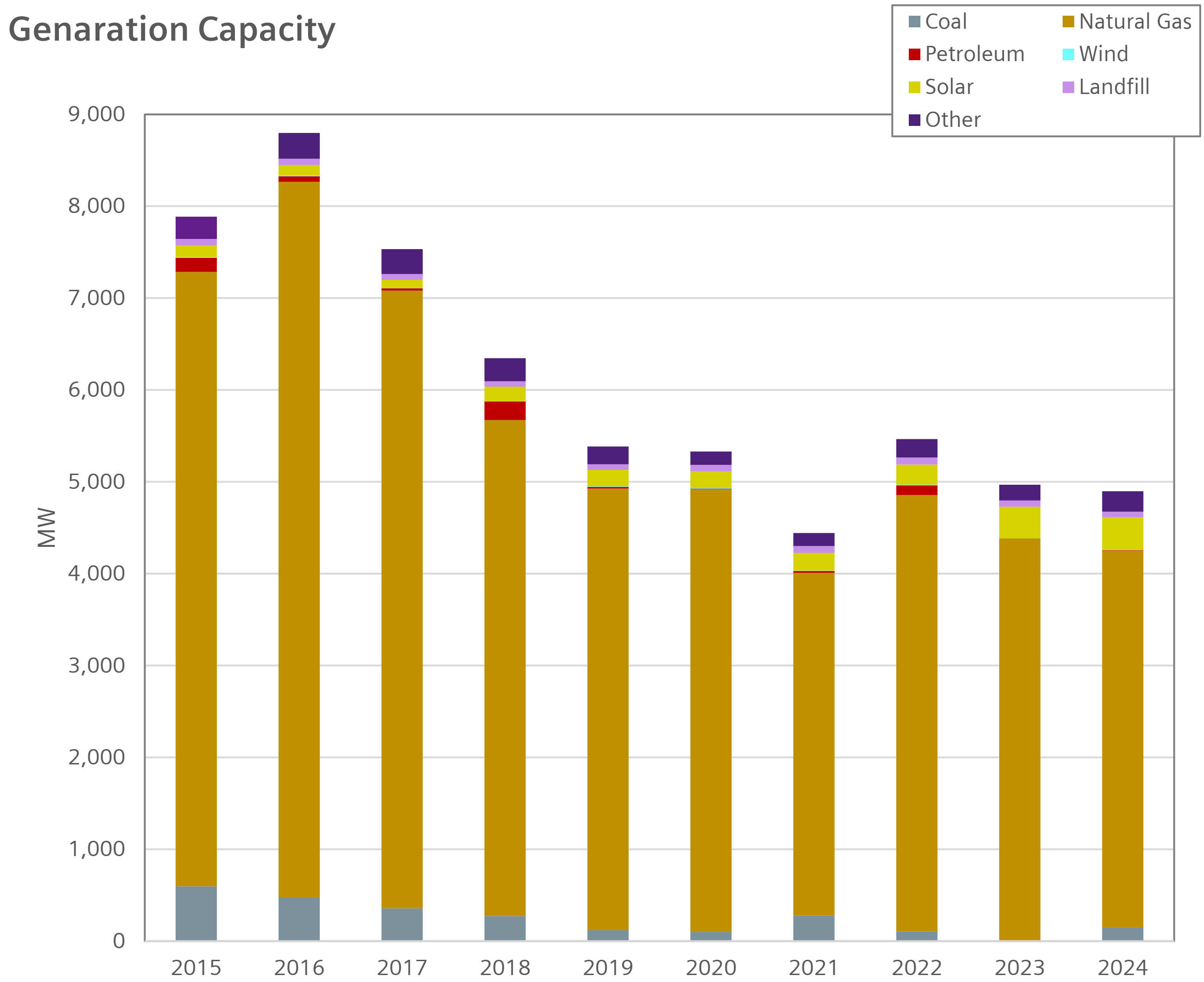

Figure 3. Delaware installed generation capacity (MW).

Figure 4 maps Delaware's installed generation capacity. The majority of the state's generation capacity is located in northern and central Delaware, close to industrial load centers and major transmission interfaces within the bulk power system managed by the regional transmission organization, PJM Interconnection LLC (PJM), leaving southern parts of the state more reliant on transfers from neighboring Load Deliverability Areas over the system.

The future of Delaware's electricity distribution grid will be impacted by the state's 40101(d) program. Delaware's 40101(d) program, established under the Bipartisan Infrastructure Law, provides targeted funding to strengthen electric grid resilience against disruptive events such as coastal storms and flooding. The state's approach emphasizes hardening infrastructure through measures like undergrounding, advanced reclosers, and distributed energy resource integration, all aligned with DOE resilience criteria. Delaware's strategy prioritizes solutions that reduce restoration times, improve reliability metrics, and deliver resilience benefits without materially increasing lifecycle costs.

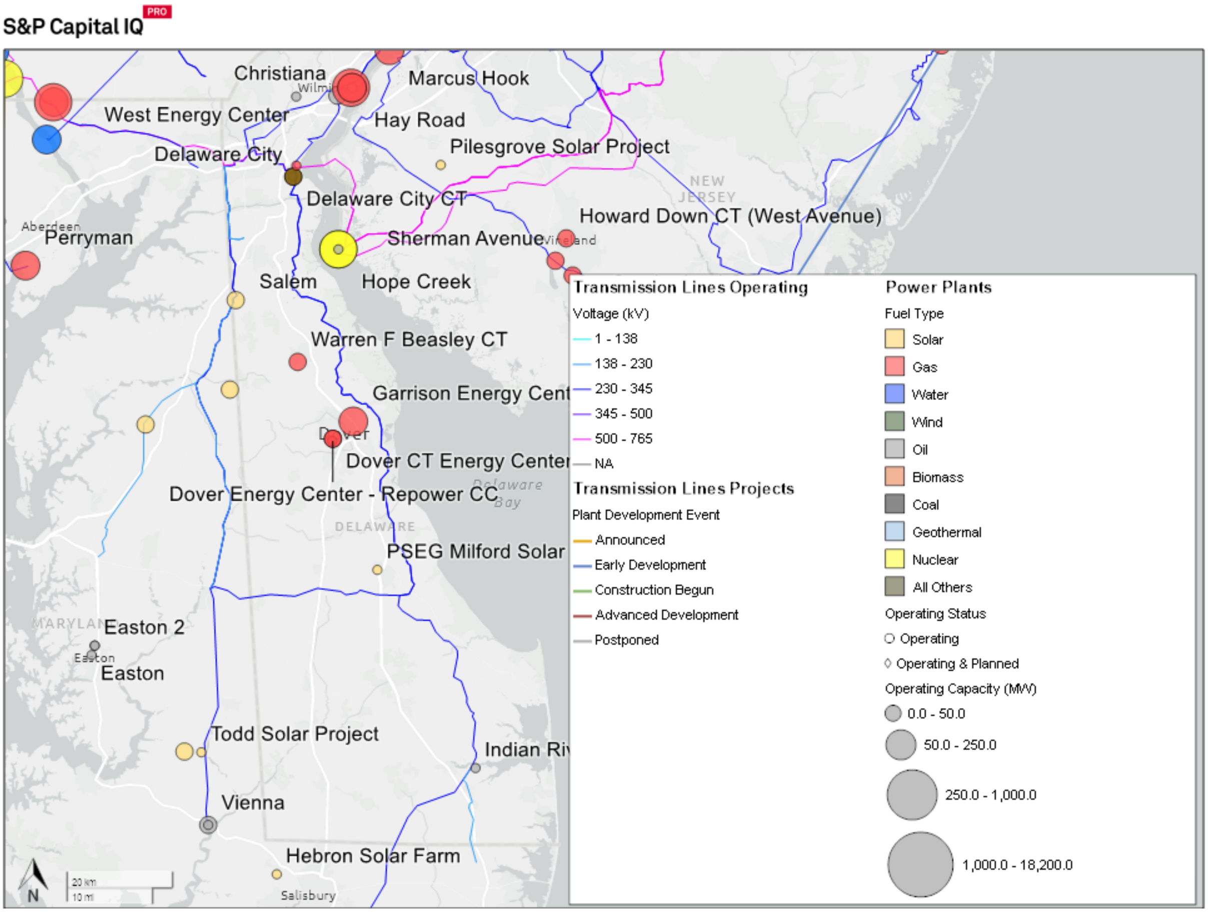

Figure 4. Delaware generation capacity map [7].

Distributed Energy Resources

Delaware has experienced a robust adoption of DER resources. According to DE Public Service Commission (PSC) data in Figure 5, DE has installed 264 MW of solar capacity and 1.04 MWh of battery storage.

[7] Adopted from S&P Capital IQ. Does not show generation <10MW

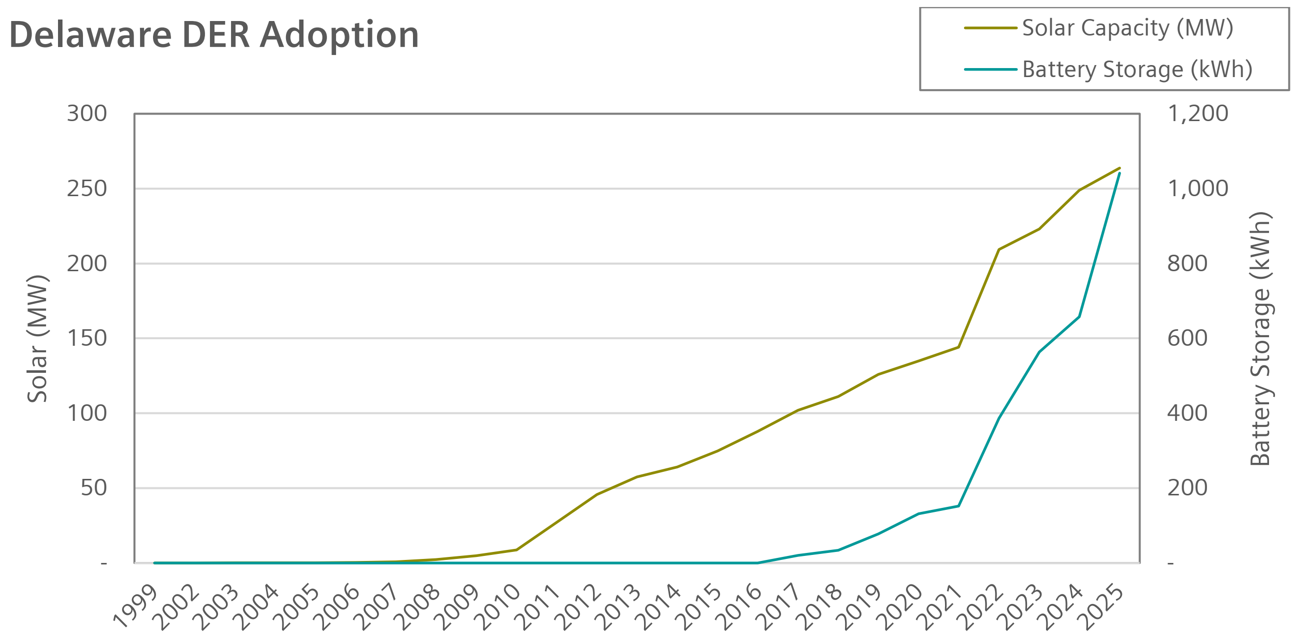

Figure 5. Delaware cumulative DER adoption [8].

Figure 6 shows the distribution and capacity of solar photovoltaic (PV) installations across Delaware, categorized into Distributed PV (yellow) and Utility PV (orange). Marker size represents total capacity, ranging from 100 kW to >50,000 kW. The largest concentration of solar capacity appears near Middletown, with a very large orange marker indicating a major utility-scale installation. Smaller clusters of distributed PV are scattered throughout the state, particularly near Wilmington and along major highways, suggesting localized adoption in residential or commercial areas.

[8] DE PSC Data

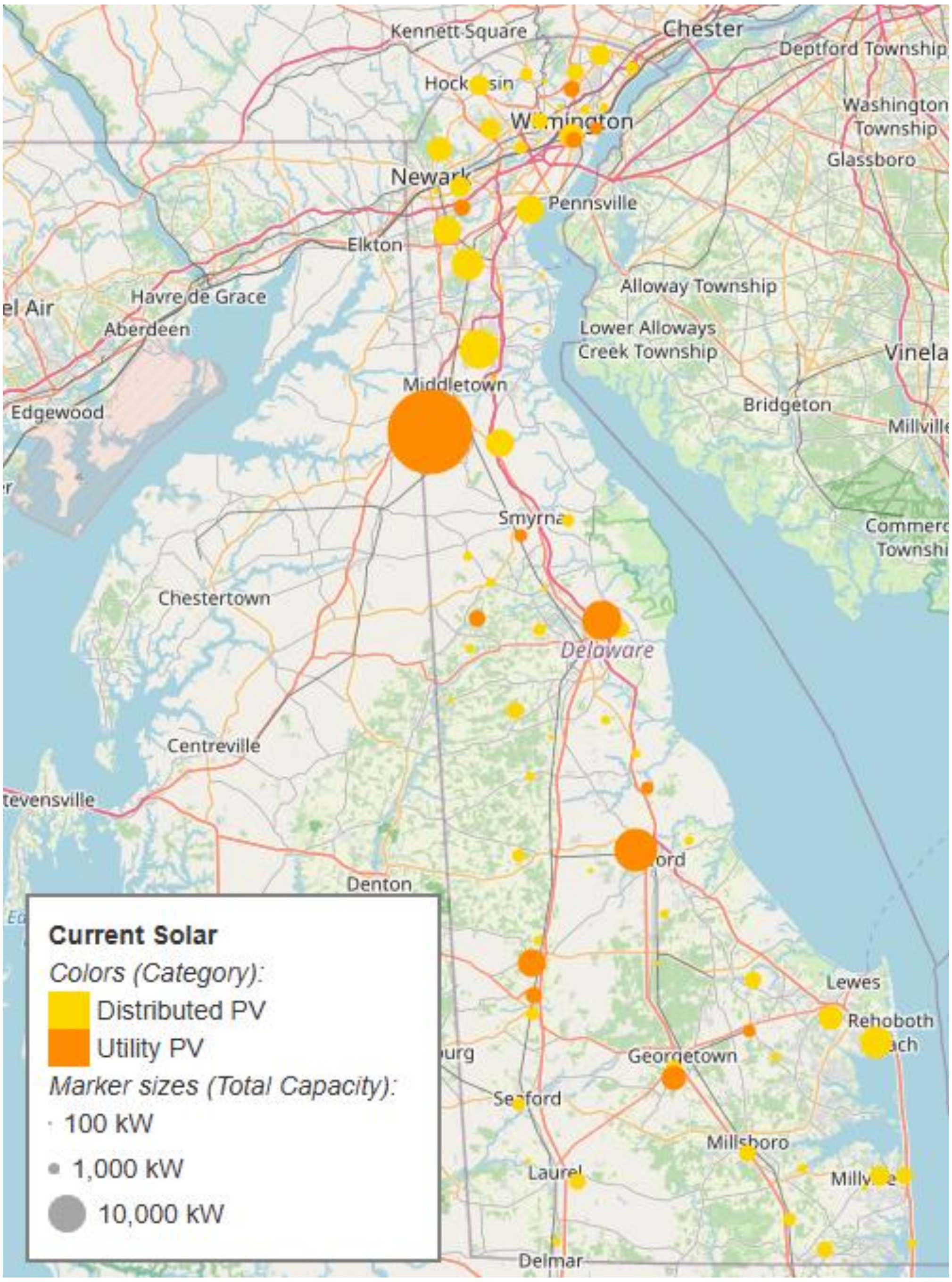

Figure 6. Delaware's solar installation by postal code.[9]

Electricity Transmission

Delaware's electricity transmission grid is primarily configured to deliver power from regional generation hubs and interstate lines into load centers such as Wilmington, Newark, and Dover. Figure 7 shows Delaware's transmission lines by voltage. Most high-voltage facilities serve as radial or sub-regional spurs off of the broader PJM network, with limited intra-state redundancy away from the main north-south corridors. At present there are no major new transmission projects in

[9] Berkley Labs https://emp.lbl.gov/tracking-the-sun. The bubble sizes in legend are for example only. The sizes are on a continuous scale, not bucketed.

advanced development that would significantly alter Delaware's import paths or internal transfer capability.

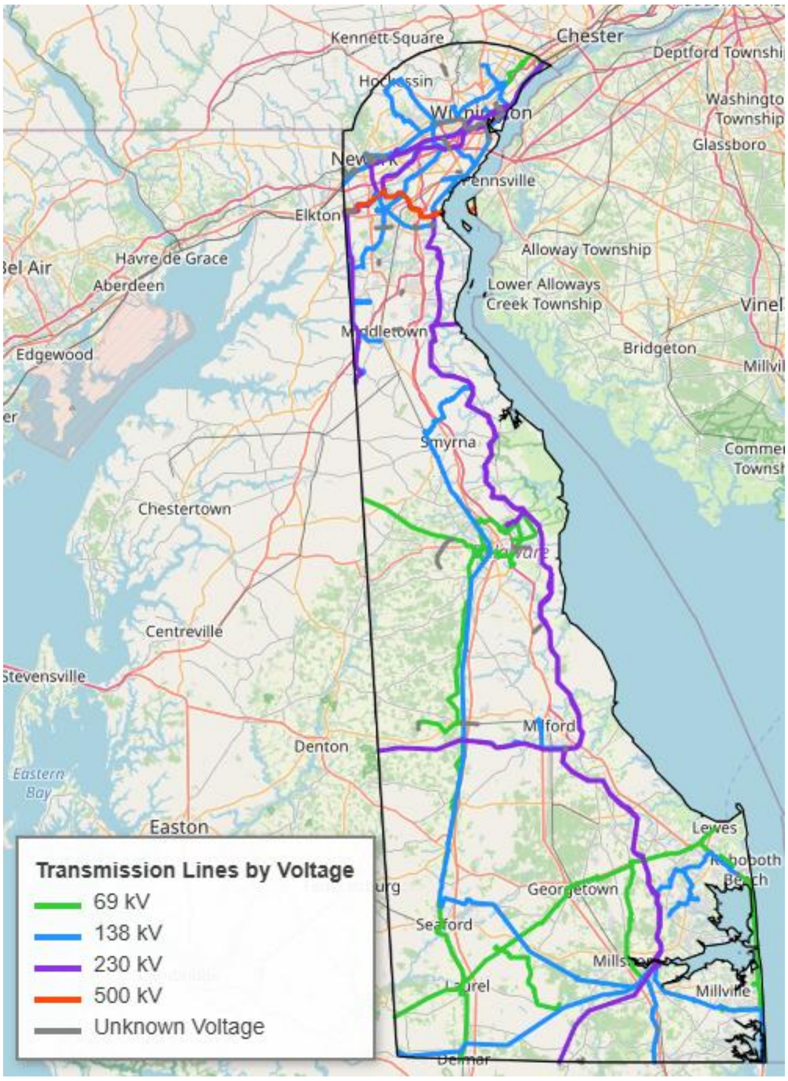

Figure 7. Delaware transmission lines by voltage [10].

Natural Gas Infrastructure

Natural gas infrastructure is key to the development of new generation and by extension, new transmission. Eastern Shore Natural Gas Company owned by Chesapeake Utilities is the principal gas transmission provider in the state. Eastern Shore has four primary interconnections with three major upstream interstate pipelines: Texas Eastern Transmission, Transcontinental Gas Pipe Line (Transco), and Columbia Gas Transmission, tying Delaware into the broader Marcellus and Gulf Coast supply basins. Figure 8, adopted from S&P Capital IQ, shows Delaware's gas pipelines and storage facilities. There are currently no large greenfield pipeline or in-state LNG import/export projects underway.

[10] EIA Energy Atlas

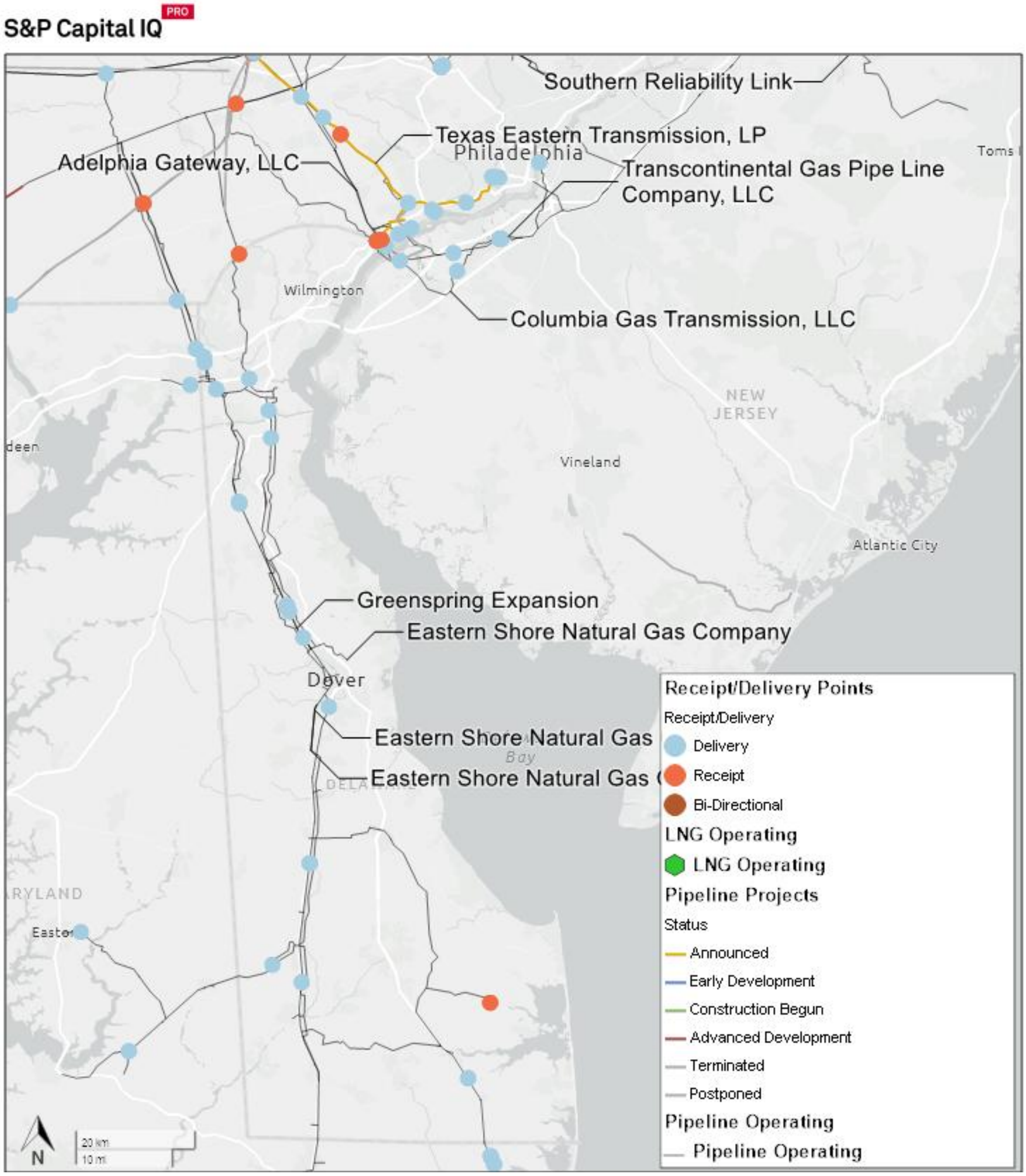

Figure 8. Delaware's gas pipelines and gas storage facilities [11].

Wholesale Electricity Prices

Locational marginal prices (LMPs) within Delaware show a persistent differential between northern and southern zones, reflecting transmission topology and the location of major generators and loads. Locational Marginal Pricing (LMP) reflects the cost of supplying electricity to a specific location on the grid and is influenced by three structural components: energy, congestion, and losses. The energy component represents the marginal cost of producing the next unit of electricity using

[11] Adopted from S&P Capital IQ

the least-cost generator available. Congestion arises when transmission constraints prevent low-cost generation from reaching certain areas, creating price differences between nodes; this component reflects the cost of relieving those constraints and becomes significant when the grid is heavily loaded. The loss component accounts for the incremental transmission losses that occur as electricity flows over long distances, which vary by location and network efficiency. Together, these factors explain why LMP prices differ across regions: areas closer to generation or with robust transmission infrastructure experience lower congestion and loss costs, while zones with binding constraints or longer transmission paths see higher prices. In Delaware, the observed price spread is consistent across the energy, congestion, and loss components of LMPs, confirming structural drivers, which are less-than-ideal local generation, transmission congestion and higher losses in the south of the state. Figure 9 shows Delaware's 2024 LMP average values across the state.

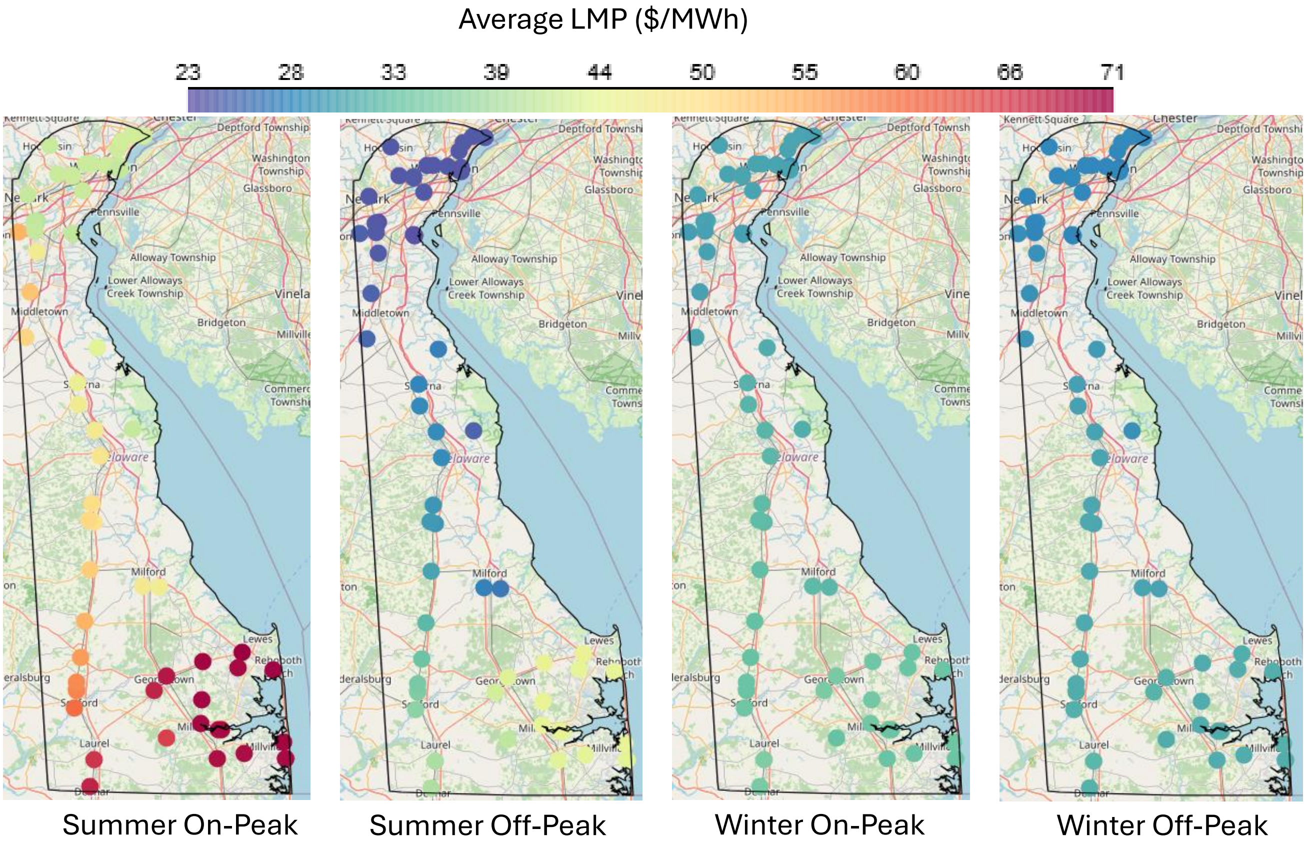

Figure 9. Delaware's 2024 average LMP values[12].

Capacity markets

PJM employs a market-based capacity construct referred to as Reliability Pricing Model to attract and maintain sufficient electricity generation resources to meet the resource adequacy needs across the regional bulk power system. In the PJM capacity construct, capacity prices are determined through Base Residual Auction (BRA), which secures capacity commitments three years ahead. Figure 10 shows recent PJM BRA capacity prices. Recent auctions, including the BRA for the 2024/2025 delivery year, have seen an increase in capacity prices from historically low levels, driven by tightening reserve margins and changes in market rules. In the BRA, capacity prices are capped at Net Cost of New Entry (CONE). The capacity prices have matched the cap for the last two auctions showing a need for new capacity resources within the state.

[12] Siemens Energy analysis of PJM LMPs

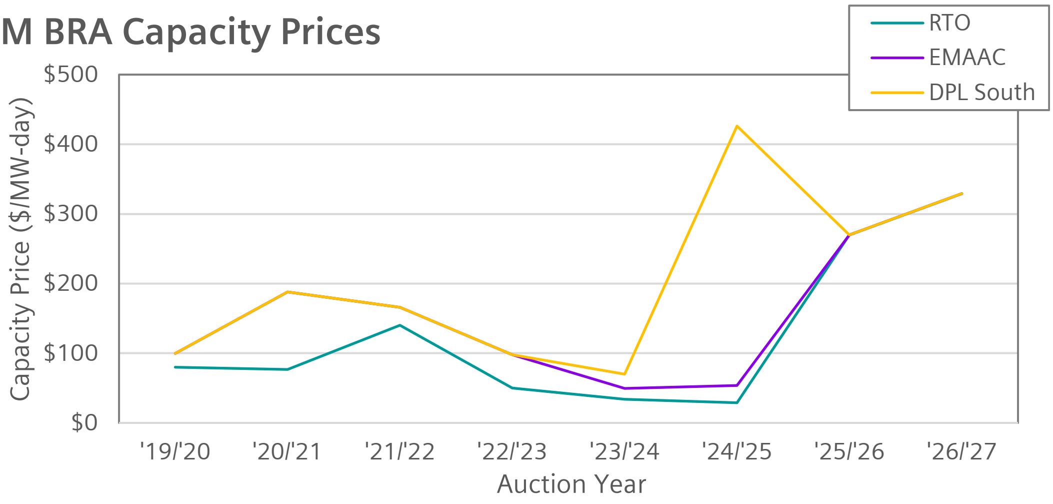

Figure 10. PJM BRA capacity prices.[13]

4. Electric Distribution Company (EDC) Profiles

4.1 Delmarva Power and Light (DPL)

Introduction

Delmarva Power and Light (DPL) is a regulated investor-owned utility and a subsidiary of Exelon Corporation. The US Energy Information Administration reports that DPL serves 554,789 electric customers in Delaware and eastern Maryland [14], and approximately 136,000 natural gas customers in northern Delaware. Delaware represents approximately 60% of DPL's total customer base and sales revenue, with the remainder in Maryland. **Note: In some cases, DPL data as reported in EIA-861 does not differentiate between Delaware and Maryland service territories. In these cases, the net reported value for DPL across both states is provided and identified as such in the footnotes.**

[13] PJM
[14] FERC Form 1 (2024)

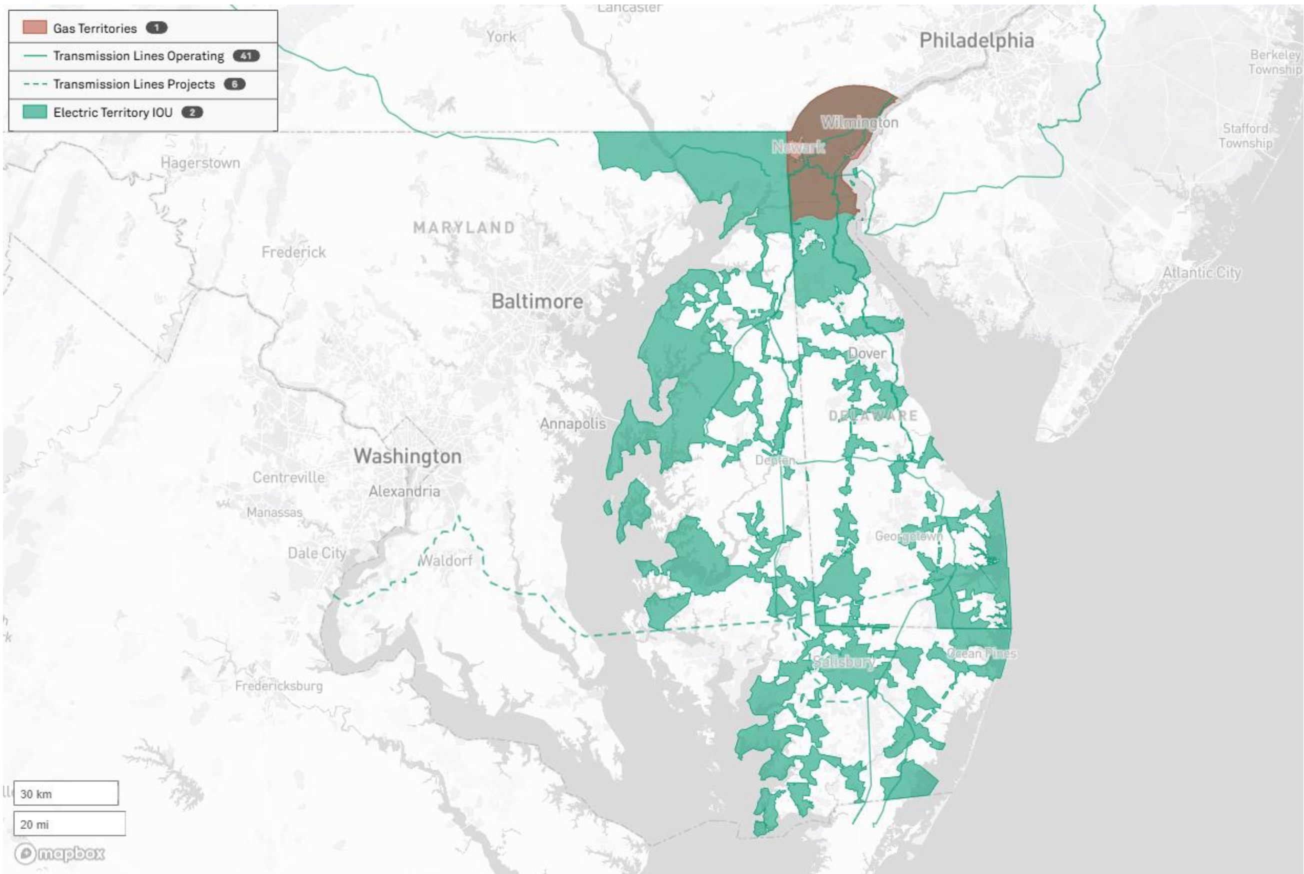

Figure 11. DPL service area.

DPL operates across a 5,400-square-mile area on the Delmarva Peninsula, with more than 300,000 electric customers in Delaware. All of New Castle County and most of the populated areas of Kent and Sussex counties fall within DPL's footprint. DPL is also the primary transmission owner in the region. Table 3 shows DPL's Delaware-based commercial information by sector in 2024, where the utility delivered about 3.8 terawatt-hours (TWh) to its 300,000 customers while reporting nearly 648 million dollars in revenue.

Table 3. DPL Delaware 2024 electric sales [15].

Customer Sector	No. of Customers	Electric Sales (MWh)	Revenue ($K)
Residential	275,018	2,916,139	502,490
Commercial	26,154	869,426	143,772
Industrial	38	16,425	1,453
Transportation	0	0	0
Total	**301,210**	**3,801,990**	**647,717**

[15] Source: EIA Form 861, DPL DE Only

Peak Demand

DPL serves a significant portion of the state's electrical demand at any given moment. Table 4 shows DPL's peak summer and winter demand over the past five years. Summer demand has shown inconsistent growth while winter demand has grown about 10% during this period.

Table 4. DPL peak demand [16].

	2020	2021	2022	2023	2024
Summer Peak (MW)	4,029	3,950	4,069	4,022	4,130
Winter Peak (MW)	3,136	3,179	3,538	3,599	3,523

System Topography

In Delaware, DPL's network comprises 273 circuits and over 160 substations, supporting a hybrid architecture with both radial and networked distribution layouts. Service reaches across dense urban and suburban loads within the peninsula's core counties. Detailed conductor mileage by voltage class is not publicly available.

Reliability Performance

Table 5 shows DPL's reliability performance across a few key parameters both with and without major event days. Major event days (MED) are days when extreme or unusual events cause widespread outages that are outside normal operating conditions. The system average interruption duration index (SAIDI) tracks the average duration (minutes) of outages per customer annually. The system average interruption frequency index (SAIFI) tracks the average number of outages per customer annually. Reliability trends in terms of both SAIDI and SAIFI have improved over 2020-2024 timeframe. In 2024, DPL was in the 34th percentile for SAIDI performance and 26th percentile for SAIFI performance among all US utilities that reported data, as shown in Figure 12 and Figure 13, respectively.

Table 5. DPL reliability performance 2020-2024 [17].

	All Events (With Major Event Days) Without Major Event Days			
	SAIDI	SAIFI	SAIDI	SAIFI
2020	272	1.07	77	0.75
2021	61	0.82	61	0.82
2022	78	0.71	65	0.65
2023	122	0.71	69	0.57
2024	127	0.77	68	0.65

[16] EIA form 861, includes DPL DE and MD territories. DPL has advised that DE is approximately 63.5% of DPL total load.
[17] EIA form 861, DPL DE only

In Figure 12 below, columns show the distribution of all EDCs in the US that reported SAIDI performance in 2024. The black column contains DPL's SAIDI performance showing DPL to outperform most peers within one standard deviation from the mean. The dotted line shows the cumulative percentage of EDCs from low SAIDI to high SAIDI values. DPL is within the top 34th percentile of reporting EDCs.

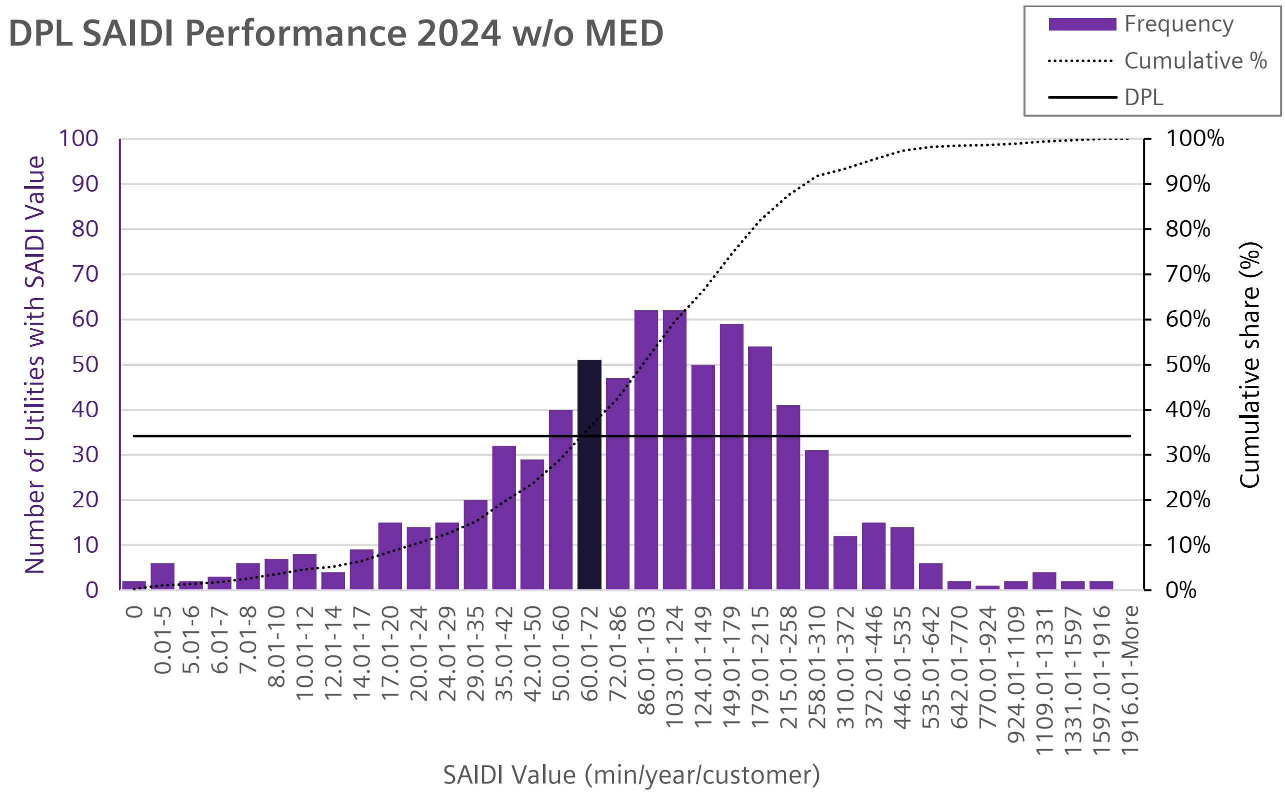

Figure 12. DPL 2024 SAIDI performance [18].

In Figure 13 below, columns show the distribution of all EDCs in the US that reported SAIFI performance in 2024. The black column contains DPL's SAIFI performance showing DPL to outperform most peers by over one standard deviation from the mean. The dotted line shows the cumulative percentage of EDCs from low SAIFI to high SAIFI values. DPL is within the top 26th percentile of reporting EDCs.

[18] SE performed histogram analysis of all entities that reported reliability data through EIA-861 for year 2024. DPL metrics are for DE only.

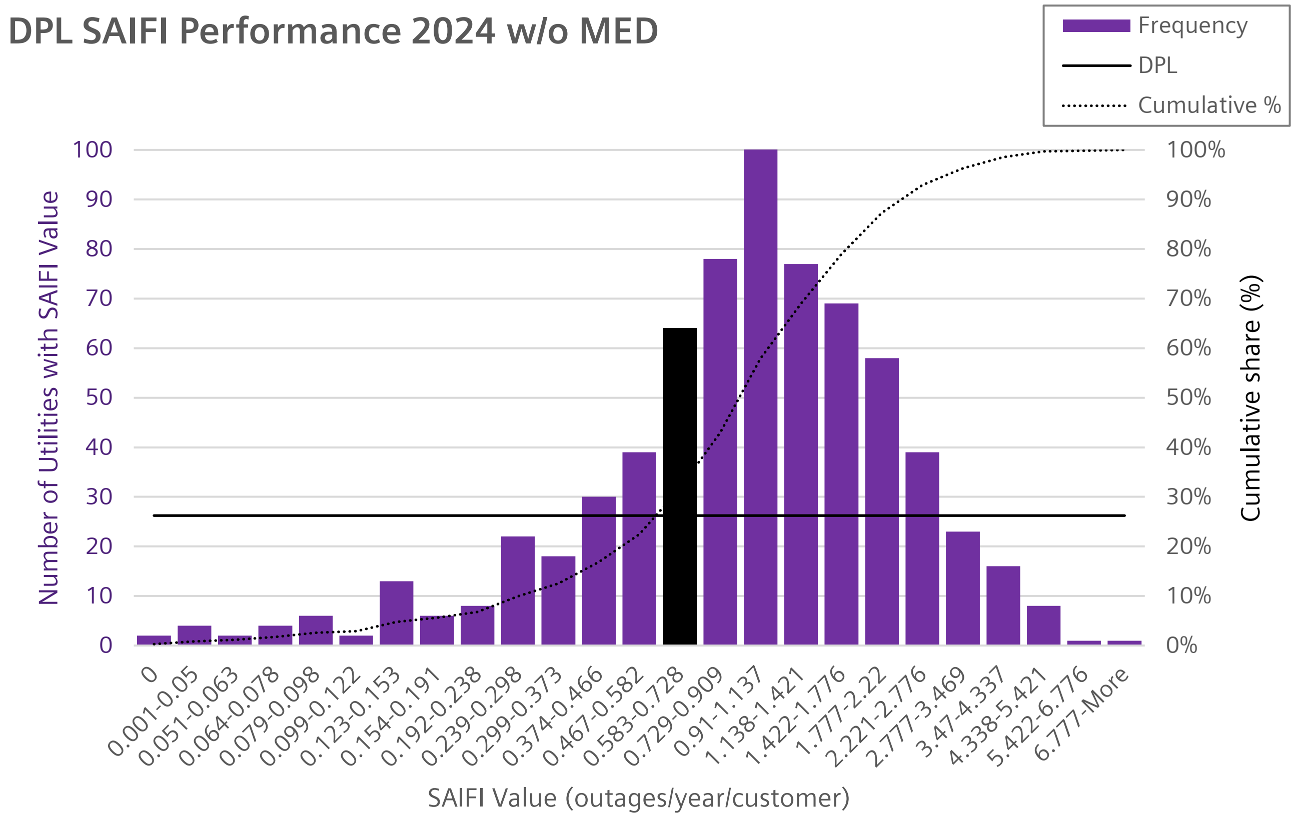

Figure 13. DPL 2024 SAIFI performance [19].

Energy Efficiency

DPL's energy efficiency performance in terms of incremental annual savings is shown in Table 6 for the past five years. In 2024, DPL's energy efficiency and demand response programs delivered lower annual incremental energy efficiency savings compared to the previous four years.

Table 6. DPL energy efficiency performance [20].

Incremental annual savings	2020	2021	2022	2023	2024
Energy Savings (MWh)	42,190	65,121	55,821	25,840	19,233
Peak Demand Savings (MW)	11.0	39.6	31.8	25.1	6.0
Customer Incentives ($K)	10,055	7,821	14,006	75,495	14,577
All Other Costs ($K)	1,969	3,338	1,942	187	480
Total Costs ($K)	12,024	11,159	15,948	75,682	15,057

Table 7 shows energy efficiency performance by sector for DPL in 2024. Residential programs dominate both savings and costs, accounting for nearly all peak demand reduction and the majority of

[19] SE performed histogram analysis of all entities that reported reliability data through EIA-861 for year 2024. DPL metrics are for DE only.
[20] Source: EIA Form 861, DE only

spending. The residential sector delivered 4,530 MWh of energy savings and 5.6 MW of peak reduction for DPL's programs, consuming about $9.6M (64% of total costs), with incentives making up almost all of the utility's spending on regulated program offerings. Commercial programs contributed the largest share of energy savings (14,517 MWh, or about 75% of total energy savings) but almost no peak reduction (0.4 MW), at a cost of $5.4M, which is relatively efficient on a $/MWh basis. Industrial programs are negligible, with only 186 MWh and zero peak impact for minimal cost.

Table 7. DPL 2024 energy efficiency performance by sector [21].

Sector	Residential	Commercial	Industrial	Total
Energy Savings (MWh)	4,530	14,517	186	19,233
Peak Demand Savings (MW)	5.6	0.4	0.0	6
Customer Incentives ($K)	9,556	5,015	6	14,577
All Other Costs ($K)	71	385	24	480
Total Costs ($K)	9,627	5,400	30	15,057

Demand Response

Table 8 summarizes DPL's demand response program performance from 2020 to 2024. DPL's demand response programs enrolled nearly 279,000 customers in 2024, delivering a potential peak demand reduction of nearly 110 MW and actual reductions of 40 MW. Program costs, including incentives and operations, were approximately $1.3M.

Table 8. DPL demand response performance [22] .

Year	2020	2021	2022	2023	2024
No. Of Customers Enrolled	273,474	227,685	191,103	306,902	279,018
Energy Savings (MWh)	0	1,103	445	45	41
Potential Peak Demand Savings (MW)	59.9	83.5	113.0	113.0	109.6
Actual Peak Demand Savings (MW)	59.9	83.5	113.0	43.4	40.0
Customer Incentives ($K)	24	1,295	0	0	8
All Other Costs ($K)	1,325	161	1,395	1,445	1,305
Total Costs ($K)	1,349	1,456	1,395	1,445	1,313

Table 9 shows DPL's 2024 demand response program performance by sector. Residential customers dominate enrollment, yet the energy savings are only 41 MWh, indicating low per-customer savings

[21] EIA Form 861, DE only
[22] EIA Form 861, DE only

and that the program's impact is primarily in peak demand rather than annual energy. The gap between potential peak demand savings (109.6 MW) and actual (40.0 MW) suggests about 36% realization.

Table 9. DPL 2024 demand response performance by sector [23].

Sector	Residential	Commercial	Industrial	Transportation	Total
No. Of Customers Enrolled	262,638	16,380	N/A	N/A	279,018
Energy Savings (MWh)	41	0	N/A	N/A	41
Potential Peak Demand Savings (MW)	108.9	0.7	N/A	N/A	109.6
Actual Peak Demand Savings (MW)	40.0	0.0	N/A	N/A	40.0
Customer Incentives ($K)	8	0	N/A	N/A	8
All Other Costs ($K)	1,305	0	N/A	N/A	1,305
Total Costs ($K)	1,313	0	N/A	N/A	1,313

In 2024 [24], DPL offered two main demand response programs in Delaware: Energy Wise Rewards (EWR) for residential customers and PJM Demand Response for commercial and industrial (C&I) customers. EWR is a voluntary summer program that cycles air conditioners or heat pumps during peak periods to reduce grid stress. Participants could choose between a web-programmable thermostat or an outdoor switch, installed at no cost, and receive one-time installation credits ranging from $40 to $80 based on their selected cycling level. Customers could also earn additional bill credits through the Peak Energy Savings Credit program on designated Peak Savings Days. Events typically occur five times per summer, and occasional compliance tests are conducted under PJM directives.

For C&I customers, participation occurs through Curtailment Service Providers (CSPs) in PJM's markets. These programs provided payments for verified load reductions during emergency or economic dispatch events, with obligations such as firm load commitments, mandatory tests, and penalties for non-performance. PJM's Capacity Performance program requires year-round readiness, while Economic Demand Response allows participation in energy and ancillary service markets. Together, these type of programs help DPL maintain reliability, reduce peak demand, and offer financial incentives for customers willing to adjust consumption during critical periods.

DPL is targeting 41.6 MW savings by 2029 through proposed programs. On December 9, 2025; DPL proposed the following programs under the title; Affordability and Load Flexibility Portfolio. These changes are not yet approved.

[23] EIA Form 861
[24] DPL has advised the DE PSC that it was ceasing its demand response programs and proposed new programs.

Table 10. DPL's proposed affordability and load flexibility portfolio[25]

Program name	Description	Allocated budget (Million $, 2027–2029)
Bring Your Own Device (BYOD) Smart Thermostat	Customers enroll eligible smart thermostats to participate in event-based demand response for incentives.	$1.51
Direct Load Control (DLC) 2.0	Direct cycling of central AC and heat pumps via smart thermostat or AMI-communicating load control switch; includes low-income access.	$19.55[26]
Whole-Home Time-of-Use (TOU) Rate	Time-based pricing to shift overall household consumption away from 2–8 p.m. peak to lower-cost periods.	$0.55
EV Smart Charge Management (SCM)	Managed EV charging through connected chargers or telematics to shift charging to off-peak periods.	$5.45
EV-Only TOU Program	Time-based pricing exclusively for EV charging to encourage off-peak charging.	$0.72
Bring Your Own Battery (BYOB) Pilot	Aggregates behind-the-meter batteries for dispatch during grid events; provides incentives and bill credits for discharging at peak.	$2.00[27]
Locational Demand Response Pilot	Targets constrained feeders with enhanced incentives to test locational DR value and inform non-wires alternatives.	$1.01
Portfolio totals	Seven-program portfolio focused on affordability, load flexibility, and equity.	**$30.78**

Distributed Energy Resources

Net Metered Distributed Energy Resource (DER), adoption in DPL's Delaware service area is robust. Table 11 shows DPL's DER adoption by technology and sector in 2024. Photovoltaics overwhelmingly dominate residential distributed resources, with 77.2 MW total capacity and 9,759 installations, driven primarily by residential and a smaller but meaningful commercial segment. Industrial participation is modest and transportation is absent. Overall, the portfolio reflects strong residential rooftop PV adoption, emerging commercial aggregation, and minimal contribution from non-PV technologies. Note: current net metering laws in Delaware only cover a narrow set of DER technologies, mainly customer-sited renewable generation. DERs, by conventional definition, also include combined heat and power, energy storage and EV V2G bi-directional charging.

[25] DE PSC Docket 25-1555
[26] DLC 2.0 budget includes approximately $8.5M one-time cost to refresh legacy devices
[27] BYOB pilot includes a $2M DESEU support grant

Table 11. DPL Net metered DER adoption 2024 [28].

Resource	Description	Residential	Commercial	Industrial	Transportation
Photovoltaic	Capacity (MW)	76.645	18.786	6.507	0.000
	Installations	9,678	313	10	0
	Energy Sold Back (MWh)	N/A	N/A	N/A	N/A
	Virtual Capacity > 1 MW (MW)	0.480	6.160	0.000	N/A
	Virtual Customers > 1 MW	71	240	0	N/A
	Virtual Capacity < 1 MW (MW)	N/A	N/A	N/A	N/A
	Virtual Customers < 1 MW	N/A	N/A	N/A	N/A
Wind	Capacity (MW)	0.64	0.035	0.000	N/A
	Installations	10	5	0	N/A
	Energy Sold Back MWh	N/A	N/A	N/A	N/A
Other	Capacity (MW)	0.000	1.450	N/A	N/A
	Installations	0	2	N/A	N/A
	Energy Sold Back (MWh)	N/A	N/A	N/A	N/A
All Technologies	Capacity (MW)	77.189	26.431	6.507	0.000
	Installations	9,759	560	10	0
	Energy Sold Back (MWh)	0.000	0.000	0.000	0.000

DPL administers small generator interconnection in Delaware under 26 Del. Admin. C. 3012, using four review levels (Level 1-4) aligned with system size and complexity. In 2024, DPL received 1,047 interconnection requests (including 342 resubmissions) totaling about 159.6 MWAC of inverter nameplate capacity and approved 1,293 requests for installation totaling roughly 129.5 MWAC [29].

DPL's community solar program in Delaware is progressing toward a stated goal of 16.7 MW energized by December 31, 2025, and 18.4 MW by the end of Q1 2026. DPL approved 955 small generator facilities in 2024, including 891 Net Metering projects, 11 Aggregated Net Metering projects, and 36 solar-plus-storage projects, plus 15 standalone battery storage and 2 storage add-on projects, with net metering alone accounting for over 21 MWAC of new capacity. DPL completed the initial completeness review within the required five business days for 89% of 2024 applications, just below the 90% benchmark. For Approvals to Install, DPL completed more than 91% of 987 Approval

[28] EIA Form 861, DE Only
[29] Source: 2024 Annual Small Generator Interconnection Report

to Install notices (ATIs) within 15 business days for Level 1 and 20 business days for Level 2, while issued 830 Authorization to Operate letters and met its 20-business-day commitment for over 97% of those. DPL also maintains a significant pipeline of community solar projects that are mostly sized between 2-4 MWAC.

Table 12. DPL DE community solar projects [30]

Projects in service	Capacity (MW)	Projects In-Service
Q4 2025	22.99	9
Q1 2026	18.45	5
Q2 2026	34.59	11
Total	76.03	25
Projects in construction [31]		
July 2026	142.38	45

Currently PSC Docket 24-1012 is reviewing DPL interconnection practices for community solar projects. As part of a report filed in this proceeding, DPL identified several process challenges, including limited queue transparency, delays in cost letters and invoicing, and inconsistent responsiveness, which have affected project timelines and developer experience. To address these issues, DPL has initiated several process improvements. These include weekly developer check-ins, assignment of dedicated project managers by jurisdiction, standardized study and design templates, and efforts to provide greater visibility into queue position and hosting capacity. The company is also working to accelerate billing and procurement processes to reduce equipment purchasing delays. [32]

Grid Enhancing Technologies

DPL has been integrating the following grid enhancing technologies (GETs) in Delaware:

1. **Distribution Automation (DA) and Automatic Sectionalization & Restoration (ASR):** DPL has implemented ASR schemes and DA enablement projects to minimize outage duration and customer impact. These upgrades include installing automated reclosers, sectionalizers, and advanced control systems that allow rapid fault isolation and service restoration.
2. **Smart Devices and Sensors:** DPL has deployed smart fault sensors and single-phase reclosing devices across its network. These technologies provide real-time monitoring and enable predictive maintenance, reducing the frequency and severity of outages.
3. **Substation Modernization:** Substation upgrades include replacing electromechanical relays with microprocessor-based relays, installing potential transformers for enhanced control, and improving physical security. These upgrades support automation and improve system resilience against equipment failures.
4. **Advanced Communication Infrastructure:** Projects such as SSN Mesh Network and fiber optics enhance connectivity for automated devices and support advanced distribution management systems (ADMS), enabling better visibility and control of grid operations.

[30] Source: DPL provided data
[31] Includes projects that have made Distribution Upgrade Payments
[32] Delaware Community Solar Status Report, November 2025

5. **Integration of DER and Hosting Capacity Improvements:** DPL is preparing its grid for higher penetration of distributed energy resources (DER) by upgrading feeders and substations to increase hosting capacity and implementing dynamic line rating tools to optimize asset utilization.

Table 13. Summary of DPL GET implementation [33].

Technology / Program	Current status / plan	Platform / vendor	Coverage / scale	Notes / next steps
Legacy HVAC load control	Upgrade from one-way paging to two-way switches using AMI communications	Itron network; vendor selection to align with AMI capabilities	Portfolio-wide conversion planned, subject to approvals	Improves flexibility and telemetry for demand response
Time-of-Use (TOU) rates	Shortening peak window, increasing rate differential; two offerings: Whole-Home and EV-only	Tariff-based; utility-managed	Available to residential customers	Supports load shifting and EV charging optimization
Smart Charge Management (EV)	Incentive-based managed charging where customers agree to utility control of charging	Current limited vendor referenced as "Weavegrid"; final selection via competitive bid	Program to expand post board approval	Integrate telemetry with AMI/DER platforms
Bring-Your-Own-Battery (BYOB)	Pilot funded by Delaware SEU for behind-the-meter batteries	Customer-owned batteries; SEU grant support	Pilot scope within DPL service area	Use for peak shaving and targeted DR events
Locational Demand Response (LDR)	Target incentives on near-capacity feeders to reduce local peak demand	Utility program	Feeder-specific targeting	Coordination with planning to identify constrained locations
Distribution Automation (DA)	Deployment of reclosers to segment feeders to ~500 customers per zone; rural limitations where tie points are unavailable	Utility-operated devices	Broadly deployed; exceptions in low-tie areas	Improves reliability and sectionalization
ADMS	Phased rollout under a multi-op project; limited functionality in each wave	PHI/DPL ADMS program	Multi-wave deployment	Provide timeline and go-live milestones in follow-up
Volt/VAR Optimization / CVR	Applied in certain areas; PJM can call events; not system-wide CVR	Substation/feeder-level controls	Selective deployment	Broader CVR strategy to be clarified with planning/automation teams

[33] SE interviews with DPL

Hosting capacity	Heat maps available online for public viewing	DPL web maps	System-wide mapping interface	Share map links and documentation
Vehicle-to-Grid (V2G)	Pilot with University of Delaware at Newark facility	University partnership	Pilot-scale	Leverage lessons for future managed charging

Distribution Planning Practices

DPL's distribution planning is governed by Delaware's Electric Service Reliability and Quality Standards (26 Del. Admin. C. § 3007), which require an annual Infrastructure, Safety, and Reliability (ISR) Plan and a rolling three-year capital spending forecast.

Delmarva Power's distribution planning practices are built around a multi-year forecasting and capacity planning process. The planning team develops both short-term and long-term capacity plans using demand projections, predictive analytics, and historical peak data. The process begins with a 10-Year Forecast (TYF), which provides a broad, long-term outlook and is updated annually to reflect summer and winter peak demands. Complementing this, a more granular 2-Year Forecast is conducted in alternating cycles, ensuring that half of the feeders are reviewed each year. These forecasts feed into a Quarterly Work Plan (QWP), which guides construction recommendations and aligns with the internal engineering calendar. The planning team leverages specialized software tools such as CYME®, DSP®, and LoadSEER® to model system needs and optimize resource allocation. The planning process also incorporates input from distributed energy resource (DER) providers, technology partners, community advocacy groups, large customers and internal teams such as finance and legal [34].

Forecasting is managed by the Capacity Planning group, which integrates corporate jurisdictional forecasts with localized historical data. DPL is in the early stages of adopting LoadSEER for spatial allocation and DER forecasting. With this implementation, DPL is refining their methodology to better anticipate load growth and distributed resource impacts. Delmarva Power's latest rate filing includes the following strategies to reinforce grid reliability and meet growing energy needs in Delaware [35]. These strategies are not yet approved.

Table 14. DPL Proposed grid reliability strategies

Project / Program Name	Description	Investment Budget
Red Lion Substation Upgrade	Transformer and equipment upgrades to meet growing demand and improve reliability for thousands of homes/businesses.	Part of $480M (2023–2026)
Mermaid Substation (New Castle County)	Installed animal deterrent fencing to prevent wildlife-related outages.	Not specified
Bridgeville Substation Transformer Replacement	Replaced outdated transformer to maintain power flow and reduce repair costs.	Not specified
Brookside Park Reliability Improvement	Moved overhead lines underground for safety, accessibility, and faster restoration.	Not specified

[34] SE interviews with DPL
[35] DE PSC Docket 25-1555

Priority Feeder Program	Identifies and repairs equipment/lines causing repeat outages.	Not specified
Multiple Interruptions Remediation Program	Investigates and upgrades equipment for customers with repeat outages.	Not specified
Bill Stabilization Adjustment (BSA)	Adjusts billing to reduce weather-related impacts and provide predictable charges.	Not specified
Low-to-Moderate Income Rate	20% discount on delivery charges for eligible customers.	Not specified
Energy Assistance & Outreach	Relief fund, payment plans, bill credits, and engagement programs.	$23M (2024 assistance)

4.2 Delaware Electric Cooperative (DEC)

Introduction

DEC is Delaware's only member-owned, not-for-profit electric cooperative. Headquartered in Greenwood, DEC operates as a Touchstone Energy Cooperative and is a member of Old Dominion Electric Cooperative, which provides its members with generation services. Its service territory spans both rural and coastal areas, including Georgetown, Millsboro, Laurel, Camden, and Harrington. DEC also owns a 4MW solar PV system at Bruce A. Henry Solar Farm, just outside the town of Georgetown in Sussex County. DEC serves more than 118,000 member-owners across Kent and Sussex Counties. The cooperative operates 28 substations, supported by a 250-mile custom fiber communications backbone.

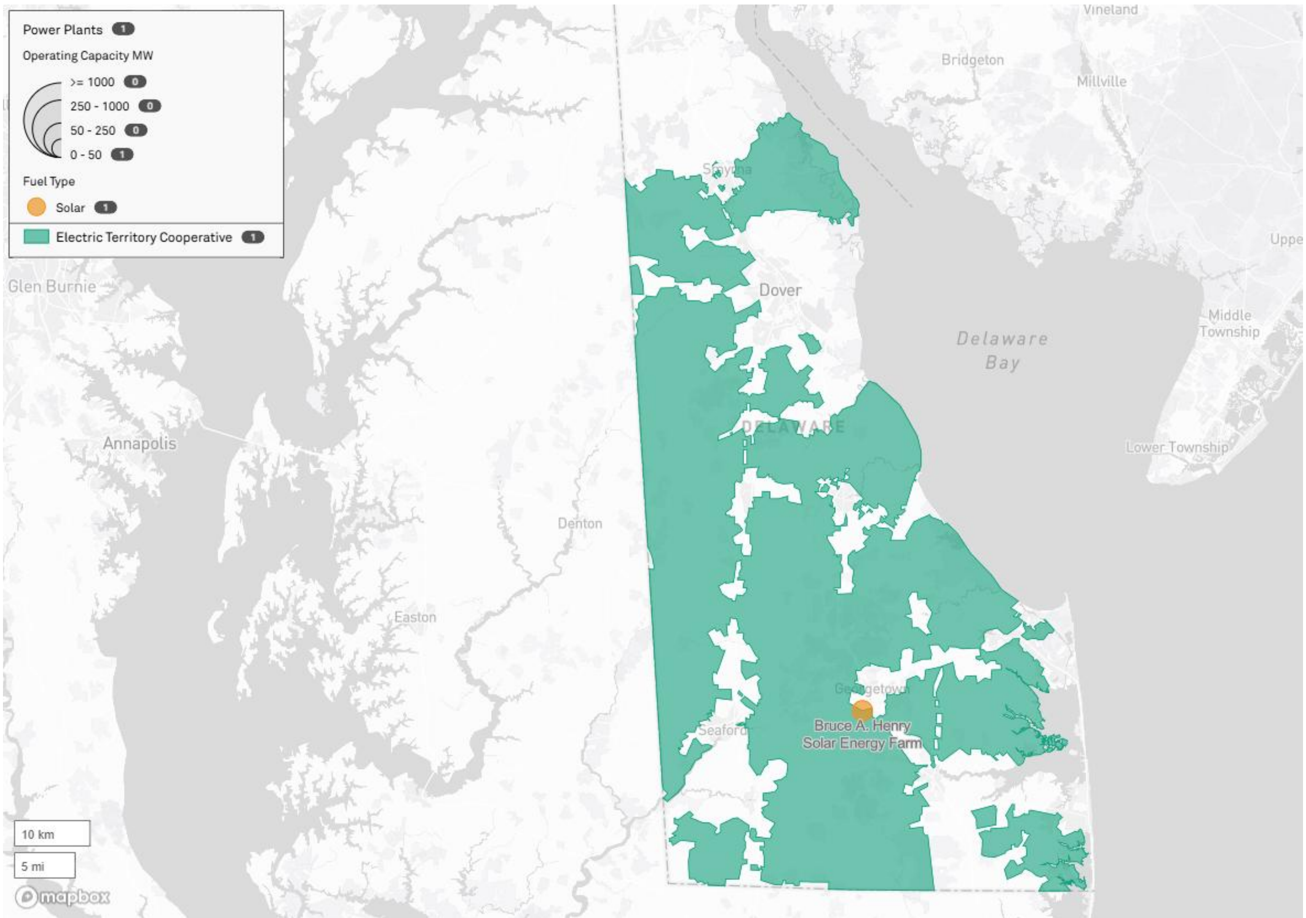

Figure 14. DEC service area.

Table 15 shows DPL's Delaware-based commercial information by sector in 2024, where the utility delivered about 1.6 TWh to its 119,000 customers while reporting nearly 228 million dollars in revenue.

Table 15. DEC 2024 electric sales [36].

Customer Sector	No. of Customers	Electric Sales (MWh)	Revenue ($K)
Residential	104,839	1,297,535	184,505.0
Commercial	13,488	304,626	42,188.0
Industrial	317	4,692	873.0
Transportation	0	0	0
Total	118,644	1,606,853	227,566

Peak Demand

Table 16 shows DEC's peak summer and winter demand between 2020 and 2024. 2024 Peak demand reached 460 MW in summer and 368 MW in winter, reflecting 2.6% CAGR in summer demand from 2020 levels.

[36] Source: EIA Form 861

Table 16. DEC peak demand [37].

	2020	2021	2022	2023	2024
Summer Peak (MW)	415	410	405	438	460
Winter Peak (MW)	310	310	378	400	368

System Topography

DEC's network comprises 91 radial circuits, with conductor miles segmented by primary and secondary voltages, and relies on the traditional radial topology. Of these 91 circuits, 76 are managed using voltage optimization systems. Voltage optimization is a strategy which leverages hardware and software systems to finely control distribution circuit voltage, leading to improved service quality and reliability, and lower energy consumption.

Reliability Performance

Table 17 shows DEC's reliability performance across a few key parameters both with and without major event days. Reliability trends in terms of both SAIDI and SAIFI have improved over 2020-2024 timeframe, reducing SAIDI from 107.6 minutes to 61.3 minutes and SAIFI from 1.55 to 0.943. In 2024, DEC was in the 30th percentile for SAIDI performance and 45th percentile for SAIFI performance among all US utilities that reported data, as shown in Figure 15 and Figure 16, respectively.

Table 17. DEC reliability performance 2020-2024.

	All Events (With Major Event Days)		Without Major Event Days	
	SAIDI	SAIFI	SAIDI	SAIFI
2020	292.10	2.930	107.60	1.550
2021	78.07	1.472	78.07	1.472
2022	89.51	1.344	73.45	1.170
2023	83.12	1.292	68.14	1.134
2024	95.67	1.108	61.33	0.943

[37] EIA Form 861

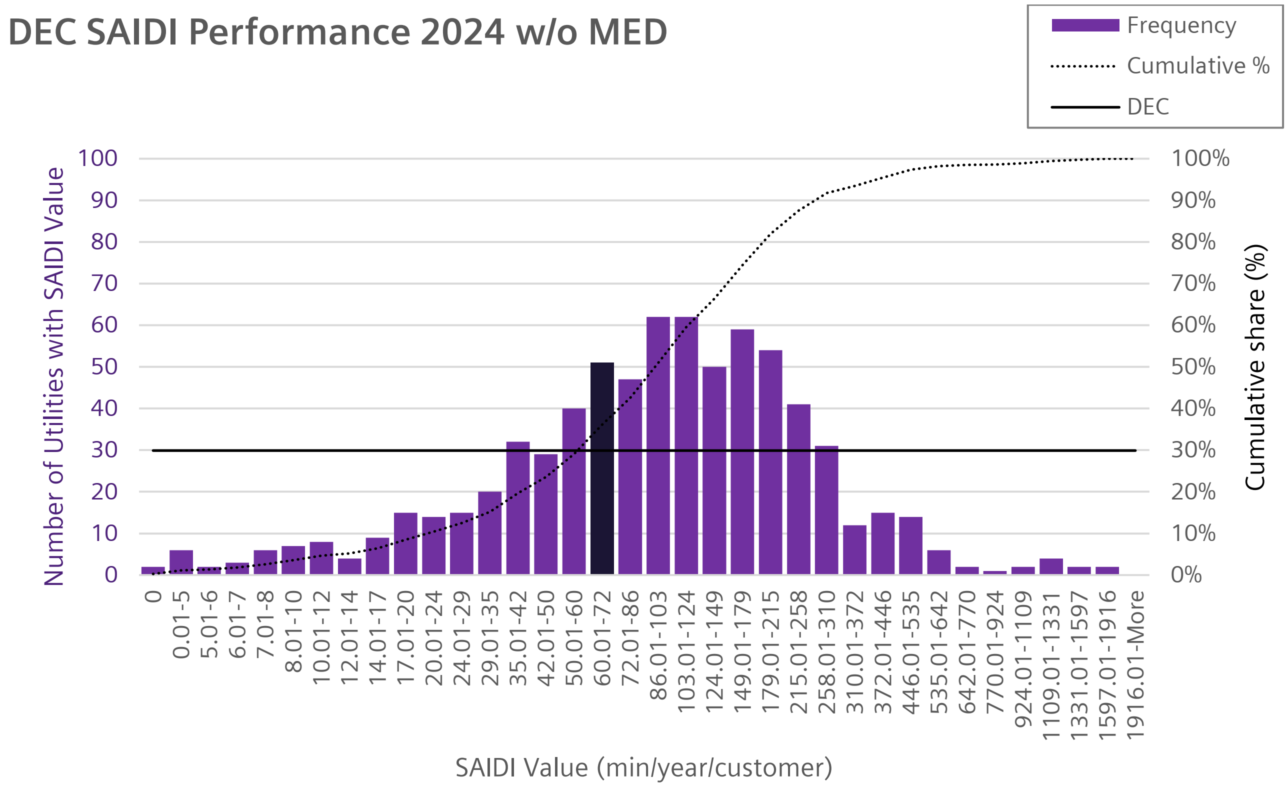

Figure 15. DEC 2024 SAIDI performance [38].

[38] SE performed histogram analysis of all entities that reported reliability data through EIA-861 for year 2024.

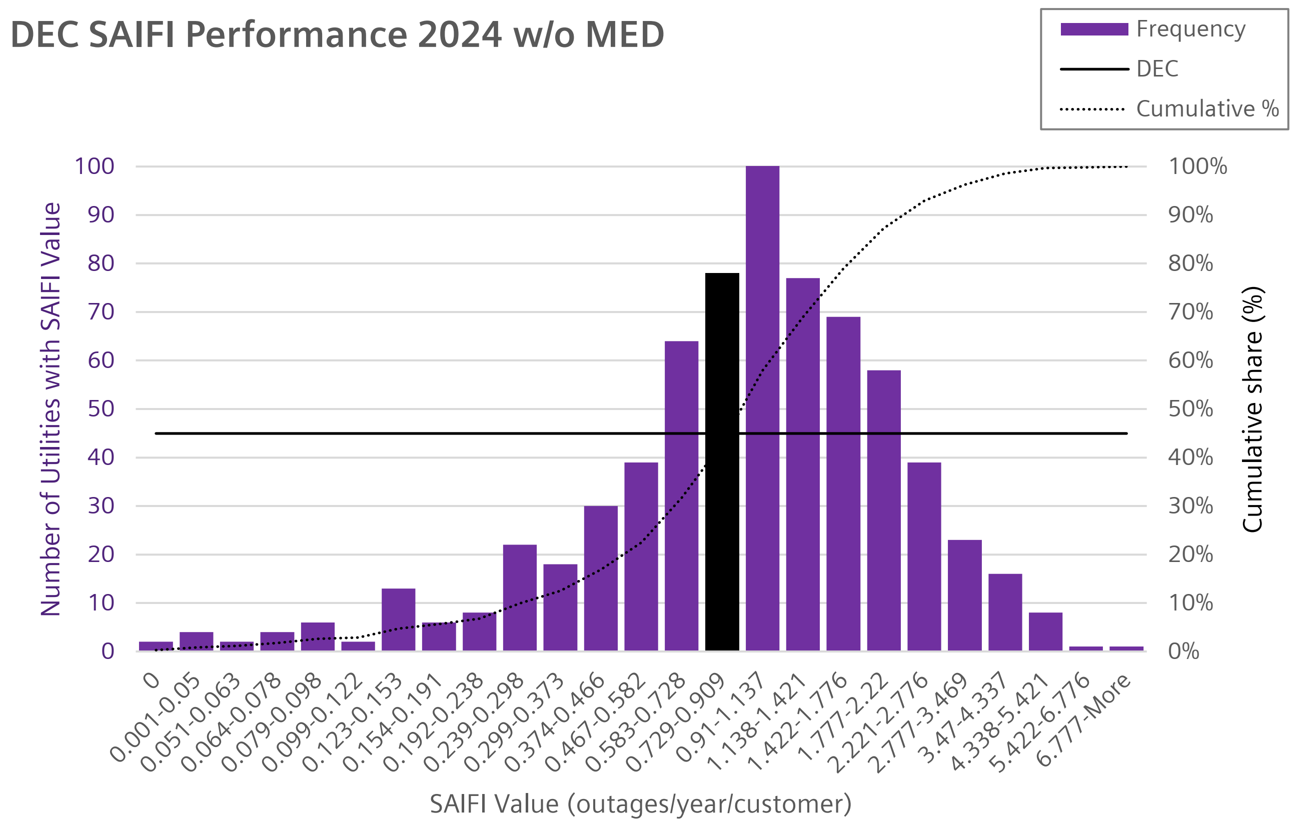

Figure 16. DEC 2024 SAIFI performance [39].

Energy Efficiency

DEC offers a suite of energy efficiency programs funded through both cooperative and state-level initiatives. DEC's energy efficiency performance in terms of incremental annual savings is shown in Table 18 for the past five years. Energy efficiency initiatives delivered incremental annual savings of 464 MWh and 5.6 MW in 2024, supported by $1.4 million in customer incentives.

Table 18. DEC energy efficiency performance.

Incremental annual savings	2020	2021	2022	2023	2024
Energy Savings (MWh)	796	722	875	916	464
Peak Demand Savings (MW)	7.0	22.0	23.0	25.0	5.6
Customer Incentives ($K)	1,777	224	1,245	1,313	1,413
All Other Costs ($K)	178	1.652	135	142	155
Total Costs ($K)	1,955	1,876	1,380	1,455	1,568

[39] SE performed histogram analysis of all entities that reported reliability data through EIA-861 for year 2024.

Table 19 shows energy efficiency performance by sector for DEC in 2024. Residential programs deliver the majority of energy savings (249 MWh) while accounting for all peak demand reduction (5.6 MW), at a cost of $125K (about 8% of total costs). DEC reported to EIA that their 2024 commercial programs contribute significant energy savings with 214 MWh (46% of total) but did not report significant peak reduction, while incurring $1.34M in costs.

Table 19. DEC 2024 energy efficiency performance by sector [40].

Sector	Residential	Commercial	Industrial	Total
Energy Savings (MWh)	249	214	N/A	464
Peak Demand Savings (MW)	5.6	0.0	N/A	5.6
Customer Incentives ($K)	114	1,299	N/A	1,413
All Other Costs ($K)	11	144	N/A	155
Total Costs ($K)	125	1,343	N/A	1,568

Demand Response

Table 20 summarizes DEC's demand response program performance from 2020 to 2024. DEC operates a demand response initiative branded as the "Beat the Peak" program, designed to reduce member electricity use during periods of highest grid demand and energy costs. The program utilizes mobile app notifications, email alerts, and automated calls to inform members during events and offers bill credits or other incentives. In 2023, DEC ended its residential load control switch program for water heaters and HVAC units due to aging technology and increasing costs, which explains a drop in the number of customers enrolled in DR programs between 2022 and 2023.

Table 20. DEC demand response performance [41].

Year	2020	2021	2022	2023	2024
No. Of Customers Enrolled	30,130	28,859	28,618	3,778	4,036
Energy Savings (MWh)	0	1	0	54	26
Potential Peak Demand Savings (MW)	45.2	37.8	37.7	337.5	114.7
Actual Peak Demand Savings (MW)	37.9	32.1	32.0	41.7	33.7
Customer Incentives ($K)	563	563	563	2,008	1,748
All Other Costs ($K)	58	58	58	201	175
Total Costs ($K)	621	621	621	2,209	1,923

DEC's Beat the Peak program is voluntary, targeting both residential and commercial members. The program enables load reductions through member actions (delaying EV charging, adjusting

[40] EIA form 861
[41] EIA Form 861

thermostat settings, cycling HVAC, etc.), direct load control for smart devices, and energy conservation behaviors. Additionally, DEC has deployed:

- Time-of-Use (ToU) tariffs for Residential & commercial (mostly for farms) customers.
- Managed EV charging using telematics though Optiwatt.
- Conservative Voltage Reduction (CVR) mainly used during DR events

Table 21 shows DEC's 2024 demand response program performance by sector. Residential customers dominate enrollment with the energy savings of 26 MWh and peak demand savings of 95 MW. The gap between potential peak demand savings across all sectors (114.7 MW) and actual (33.7 MW) suggests about a 29% realization rate, meaning 29% percent of potential 114.7 MW savings were actually achieved on the event day. This compares to a national average of 52%.

Table 21. DEC 2024 demand response performance by sector [42].

Sector	Residential	Commercial	Industrial	Total
No. Of Customers Enrolled	2,873	1,163	N/A	4,036
Energy Savings (MWh)	26	0	N/A	26
Potential Peak Demand Savings (MW)	94.9	19.873	N/A	114.7
Actual Peak Demand Savings (MW)	22.2	11.4	N/A	33.7
Customer Incentives ($K)	73	1,675	N/A	1,748
All Other Costs ($K)	7	168	N/A	175
Total Costs ($K)	80	1,843	N/A	1,923

Distributed Energy Resources

Table 22 shows DEC's DER adoption by technology and sector in 2024. Photovoltaics account for nearly all distributed resource capacity, totaling 38 MW across 3,427 installations, with residential contributing 26.13 MW and commercial 12.03 MW. Wind resources are negligible at 0.019 MW from 7 installations, and there is no participation from industrial or transportation sectors. Overall, DEC's DER portfolio shows strong reliance on residential and commercial PV adoption with minimal diversification into other technologies. There are no formal customer battery programs at DEC yet; around 20 customers are known to have batteries (mostly paired with solar), but they are not dispatched for demand response or other programs.

[42] EIA form 861

Table 22. DEC DER adoption 2024 [43].

Resource	Description	Residential	Commercial	Industrial	Transportation	Total
Photovoltaic	Capacity (MW)	26.133	12.029	N/A	N/A	38.162
	Installations	3,111	136	N/A	N/A	3,427
	Energy Sold Back (MWh)	N/A	N/A	N/A	N/A	0.000
Wind	Capacity (MW)	0.014	0.005	N/A	N/A	0.019
	Installations	6	1	N/A	N/A	7
	Energy Sold Back (MWh)	N/A	N/A	N/A	N/A	0.000
All Technologies	Capacity (MW)	26.147	12.304	0.000	0.000	38.181
	Installations	3,117	137	0	0	3,254
	Energy Sold Back (MWh)	0.000	0.000	0.000	0.000	0.000

On March 2024, Delaware Electric Cooperative (DEC) submitted a grant application for funding under section 40101(d) to design and install a battery storage system at the Bruce A. Henry Solar Farm near Georgetown, Delaware. This will be matched with funds from the SEU pursuant to legislation passed in the summer of 2025. The proposed project involves the installation of a 2 MW/4 MWh lithium-ion battery storage facility at the site of the existing 4 MW solar farm, which serves a designated disadvantaged community (DAC). DEC requested $1 million in grant funding over two years ($500,000 per year), with a 35% cooperative match, to cover engineering analysis, equipment procurement, infrastructure upgrades, installation, testing, and impact analysis. The total project cost is estimated at $3.56 million. The application states that the battery storage system is intended to improve grid resiliency by reducing outages for approximately 5,000 members, including those in the Georgetown DAC, and to enable the integration of additional residential solar installations in areas currently closed to new solar due to grid constraints. DEC estimates the project will offset 170 MWh of fossil fuel generation annually, resulting in an estimated reduction of 119 metric tons of CO_2 emissions and annual demand response savings of $158,000.

Grid Enhancing Technologies

DEC is implementing various GETs as described in Table 23.

Table 23. DEC grid enhancing technology adoption [44].

Area/Program	Status/Details
AMI	Fully deployed RF mesh; analog opt-out available
DERMS	In use for DR (thermostats, EVs); expanding to new resources
ADMS/OMS	Platforms in place; AMI integration for outage management

[43] EIA form 861
[44] SE interviews with DEC

Dynamic Line Rating	Using GRIDSIGHT software for visibility and identification of over/under-utilized transformers
Distribution Automation	Transitioning from "dumb" fault indicators to smart sensors with voltage monitoring linked to SCADA
CVR	Used for load reduction during DR events
Bidirectional Charging	Early-stage exploration, no deployments yet
Battery/Microgrid	40101(d) grant approved for 7MW battery storage at Bruce A. Henry Solar Farm. The battery will be used for demand side management applications
Hosting Capacity	Public map available; internal/consultant studies performed as needed

Distribution Planning Practices

Distribution planning follows a six-year horizon, updated every four years, with the current plan covering 2024-2028. Planning teams from engineering, substations, and system protection collaborate using tools such as Windmill for forecasting, e-Tap for modeling, and Pole Foreman for line design. Forecasting incorporates land-use trends but excludes EV growth assumptions due to low penetration (1-2% of members).

4.3 Delaware Municipal Electric Corporation (DEMEC)

Introduction

DEMEC is a public corporation and joint action agency, serving as the wholesale electric utility for nine municipal electric departments throughout Delaware. DEMEC represents the combined electric systems of Clayton, Dover, Lewes, Middletown, Milford, New Castle, Newark, Seaford, and Smyrna. The nine DEMEC member utilities combined serve about 77,400 customers, with a combined peak demand of 472 MW. The DEMEC member distribution systems vary in size and character. DEMEC is a generation owner and the PJM Load Serving Entity ("LSE") for its eight (8) full-requirements municipal member utilities and provides 100% of their wholesale power supply requirements.

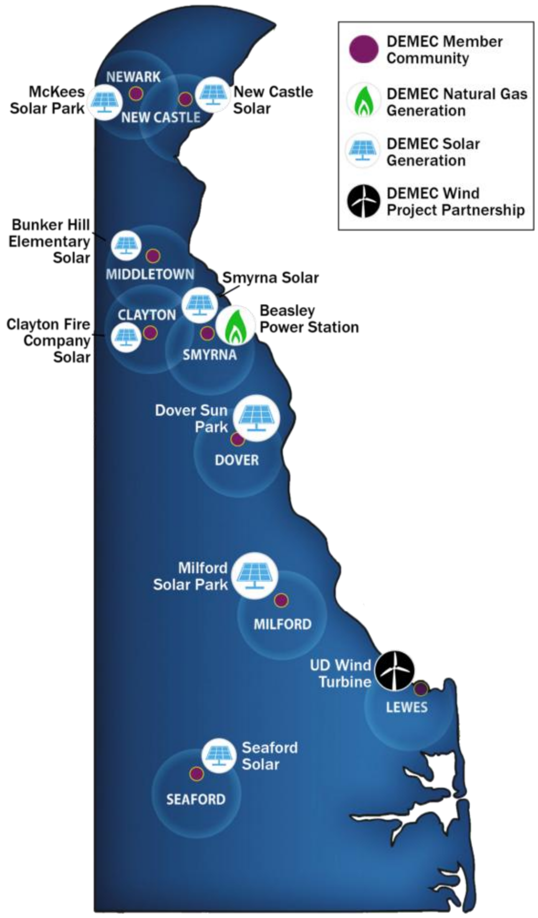

Figure 17. DEMEC members.

Note: only few DEMEC members report data through EIA form 861. The following information reflects the most detailed information publicly available. Table 24 shows DEMEC member annual energy usage between 2020 and 2024. Annual energy usage across members totaled 2,115 GWh in 2024, with Dover, Newark, and Middletown accounting for the largest shares.

Table 24. DEMEC member usage (MWh) [45].

Member	2020	2021	2022	2023	2024
Clayton	22,887	23,745	24,246	23,740	24,715
Dover	732,176	752,237	752,618	722,160	714,884
Lewes	83,072	87,427	88,365	84,122	88,618
Middletown	263,245	279,278	284,722	280,230	290,109
Milford	234,410	244,698	250,329	242,050	248,016
Newark	433,533	451,781	454,611	438,876	436,630
New Castle	80,671	82,112	82,059	78,203	77,263
Seaford	110,241	115,224	120,019	117,209	116,979

[45] DEMEC responses to SE request for information

Smyrna	119,883	123,005	122,735	117,594	117,769
Total	**2,080,118**	**2,159,508**	**2,179,706**	**2,104,184**	**2,114,983**

Table 25 shows DEMEC's commercial information by sector for its four largest members in 2024, where these four members delivered about 1.7 TWh to their 57,000 customers while recognizing nearly 198 million dollars in revenue.

Table 25. DEMEC's four largest members' 2024 electric sales [46].

Member	Customer Sector	No. of Customers	Electric Sales (MWh)	Revenue ($K)
City of Dover	Residential	21,601	211,090	32,754.0
	Commercial	3,485	222,788	28,924.0
	Industrial	40	281,006	26,276.0
	Transportation	N/A	N/A	N/A
	Total	25,126	714,884	87,954.0
Town of Middletown	Residential	9,071	100,606	17,226.8
	Commercial	694	8,162	1,506.2
	Industrial	403	164,300	21,377.5
	Transportation	N/A	N/A	N/A
	Total	10,168	273,068	40,110.5
City of Mil-ford	Residential	7,169	79,966	12,128.9
	Commercial	1,559	68,432	9,686.6
	Industrial	12	90,239	10,676.1
	Transportation	0.0	0	0
	Total	8,740	238,637	32,491.6
City of Newark	Residential	11,888	98,785	18,762.0
	Commercial	1,492	73,371	12,830.7
	Industrial	59	250,502	30,063.6
	Transportation	0.0	0	0
	Total	13,439	422,658	61,656.3
Total		**57,473**	**1,649,247**	**198,460**

[46] EIA form 861

Peak Demand

Table 26 shows DEMEC's peak summer demand between 2020 and 2024. DEMEC summer peak demand has remained relatively flat over this time.

Table 26. DEMEC members' summer peak demand (MW) [47].

Member	2020	2021	2022	2023	2024
Clayton	6.7	6.7	7.2	7.1	7.5
Dover	161.4	155.9	164.9	157.3	163.8
Lewes	21.3	21.6	21.9	22.3	22.4
Middletown	61.4	63.4	63.3	65.3	67.4
Milford	49.2	51.2	51.8	51.1	53.0
Newark	90.2	94.1	94.6	94.0	87.5
New Castle	18.7	18.6	18.8	18.3	18.2
Seaford	23.7	23.5	24.6	24.0	24.4
Smyrna	33.2	29.0	29.4	28.9	28.7
Total	**465.7**	**463.8**	**476.5**	**468.2**	**472.9**

System Topography

DEMEC's member systems vary widely in size and complexity. Dover operates 52 distribution circuits, 47 of which have voltage optimization, while smaller towns like Middletown and Milford maintain fewer circuits with limited automation. Newark, with 34 circuits, has begun implementing advanced metering infrastructure (AMI).

Table 27. DEMEC members' system topography, sub-selection [48].

Utility Name	Distribution Circuits	Circuits with Voltage Optimization
City of Dover - (DE)	52	47
Town of Middletown - (DE)	9	9
City of Milford - (DE)	11	0
City of Newark - (DE)	34	0

[47] DEMEC responses to SE request for information
[48] EIA form 861

Reliability Performance

Public reliability data is limited across DEMEC. Only the City of Newark reported reliability data through EIA Form 861. City of Newark reported a SAIDI of 84.4 minutes and SAIFI of 0.77 in 2024, indicating strong performance compared to national averages.

Table 28. City of Newark (DEMEC member) reliability performance 2024 [49].

	All Events (With Major Event Days)		Without Major Event Days	
	SAIDI	SAIFI	SAIDI	SAIFI
City of Newark	84.400	0.770	84.400	0.770

Energy Efficiency

Table 29 shows a few of DEMEC members' energy efficiency performance in terms of incremental annual savings. Energy efficiency programs delivered measurable savings in 2024 in both the City of Newark and the Town of Middletown. Newark achieved 2,437 MWh of savings, primarily from commercial retrofits, while Middletown contributed 641 MWh. Both member systems achieved savings primarily from commercial customers, followed by residential customers. Incentives for these programs totaled $430,000 across both jurisdictions.

Table 29. DEMEC members' 2024 energy efficiency performance by sector, sub-selection [50].

Member	Sector	Residential	Commercial	Industrial	Total
Town of Middletown	Energy Savings (MWh)	34	607	0	641
	Peak Demand Savings (MW)	0.0	0.1	0.0	0.1
	Customer Incentives ($K)	9	18	0	27
	All Other Costs ($K)	27	52	0	79
	Total Costs ($K)	36	70	0	106
City of Newark	Energy Savings (MWh)	41	2,210	186	2,437
	Peak Demand Savings (MW)	0.0	0.3	0.0	0.4
	Customer Incentives ($K)	7	65	6	78
	All Other Costs ($K)	33	189	24	246
	Total Costs ($K)	40	254	30	324

[49] EIA form 861
[50] EIA form 861

Demand Response

Table 30 summarizes DEMEC's demand response program performance from 2020 to 2024. Demand response participation remains modest but impactful: Dover enrolled four large commercial and industrial customers, achieving 13.1 MW of peak demand reduction, while Middletown and Newark added smaller contributions. DEMEC's "Power Savers" program provides notifications and incentives for curtailment, complementing PJM market participation.

Table 30. DEMEC members' 2024 demand response performance by sector, sub-selection [51].

Member	Sector	Residential	Commercial	Industrial	Total
City of Dover	No. Of Customers Enrolled	N/A	3	1	4
	Energy Savings (MWh)	N/A	N/A	N/A	N/A
	Actual Peak Demand Savings (MW)	N/A	4.99	3.78	8.76
	Customer Incentives ($K)	N/A	25.30	33.02	58.32
	All Other Costs ($K)	N/A	N/A	N/A	N/A
	Total Costs ($K)	N/A	25.30	33.02	58.32
Town of Middletown	No. Of Customers Enrolled	N/A	N/A	3	3
	Energy Savings (MWh)	N/A	N/A	0	0
	Actual Peak Demand Savings (MW)	N/A	N/A	6.44	6.44
	Customer Incentives ($K)	N/A	N/A	112.73	112.73
	All Other Costs ($K)	N/A	N/A	N/A	N/A
	Total Costs ($K)	N/A	N/A	112.73	112.73
City of Newark	No. Of Customers Enrolled	N/A	2	1	3
	Energy Savings (MWh)	N/A	1	0	1
	Actual Peak Demand Savings (MW)	N/A	0.84	0.21	1.05
	Customer Incentives ($K)	N/A	1.86	0	1.86
	All Other Costs ($K)	N/A	N/A	N/A	N/A
	Total Costs ($K)	N/A	1.86	0	1.86

Distributed Energy Resources

Municipal utilities participate in the Municipal Renewable Portfolio Standard (MRPS) and aim to establish renewable portfolio goals comparable to the state. DEMEC members partner with DEMEC on load forecasting and advanced modeling and data analysis, demand response, and energy efficiency programs. Municipal utilities also continue to look at innovative technologies, such as

[51] EIA form 861

battery storage & EVs, and consider various impacts to the distribution system. Some DEMEC members have incorporated sustainability and renewable energy goals which are more aggressive than the state's goals.

DEMEC administers the MRPS on behalf of its nine municipal electric utilities. For the 2024/2025 compliance year, DEMEC was required to achieve a 24% renewable energy target, including a 3.25% solar carveout, in alignment with state law. DEMEC fulfills these obligations through a combination of owned generation assets and long-term power purchase agreements. Wind energy is sourced from the 69 MW Laurel Hill Wind Farm in Pennsylvania and the 2 MW University of Delaware wind turbine in Lewes. Solar energy is supplied from multiple projects, including Dover Sun Park, Milford Solar Farm, Seaford Solar Project, McKees Solar Park, Smyrna Solar Project, and New Castle MSC Project.

DEMEC's solar portfolio includes residential, commercial, community, and utility-scale installations, totaling over 1,300 systems and more than 18 MW of capacity. The organization also manages a Green Energy Grants Program to support additional renewable installations. For the 2024/2025 compliance year, DEMEC retired 195,582 renewable energy credits (RECs and SRECs), including 26,488 solar RECs, to meet MRPS requirements across its member communities. Table 31 shows DEMEC's installed behind-the-meter (BTM) solar capacity for the years between 2020 and 2024. BTM solar capacity reached 20.24 MW in 2024, up from 16 MW in 2020. Middletown leads with 4.5 MW, followed by Dover (5.96 MW) and Newark (2.76 MW). Lewes and Milford also maintain community-scale solar projects.

Table 31. DEMEC members' installed behind-the-meter solar capacity (MW) [52].

Member	2020	2021	2022	2023	2024
Clayton	0.22	0.42	0.48	0.50	0.55
Dover	5.69	5.99	6.39	5.71	5.96
Lewes	0.82	1.02	1.26	1.34	1.43
Middletown	3.56	3.62	3.75	3.97	4.50
Milford	1.66	1.89	1.97	2.01	2.06
New Castle	0.25	0.26	0.24	0.31	0.31
Newark	1.88	2.06	2.21	2.45	2.76
Seaford	1.24	1.24	1.24	1.30	1.33
Smyrna	0.71	0.99	1.29	1.09	1.34
Total	**16.04**	**17.48**	**18.83**	**18.68**	**20.24**

Grid Enhancing Technologies

Municipal utilities have already begun the process of implementing AMI. Through DEMEC, members are able to participate in a joint venture implementation program for their electric customers. Out of the nine municipal utilities, six have completed full implementation, one is in the process with expected completion this year, and two are in the discovery phase. Power Savers is DEMEC's demand response program which is provided to all members' customers through a notification program and a formal business incentive program. Dover also has a DR program managed by the same vendor.

[52] DEMEC responses to SE request for information

DEMEC participates in several forward-looking, innovative discussions, trainings, and research to understand the tools available to municipal utilities as the energy industry changes. In supporting the important issue of resiliency, the Town of Smyrna can island itself from the grid currently and perform as a microgrid to the entire community, and they have done so in the past several years

DEMEC has been actively evaluating battery storage technology for the past ten years. Recently, DEMEC performed a feasibility study in Milford, DE for a battery that would connect between Milford Solar and the nearby substation for mitigating backflow of power during shoulder seasons and solar soaking to help lower peak demand. DEMEC partnered with Energize Delaware for a $2M grant to make the project more cost effective to counter recent federal tariff changes. This has helped lower the risk of cost overruns of the potential project. Further interconnection studies are under way.

On March 28, 2024, DEMEC applied for federal funding under BIL section 40101(d) to implement advanced modeling technology and workforce training for eight municipal electric utilities in Delaware. The proposal outlines plans to use CYME Power Engineering Software to conduct hosting capacity studies, develop feeder-level heat maps, and support planning for distributed energy resources such as solar and battery storage. The project budget totals $1,215,000 over three years, with a requested grant of $810,000 and a one-third cost match from DEMEC and its partners. Objectives include improving grid reliability metrics, identifying locations for additional solar deployment, supporting low-income solar programs, and enhancing emergency preparedness for communities exposed to storm and flooding risks.

Distribution Planning Practices

Distribution planning is completed on a regular, as-needed-basis, throughout the year as municipal utilities plan for new developments and policy changes. DEMEC regularly analyzes and plans for needed growth improvements and maintenance or repairs of their distribution system, however, not all municipal utilities have the resources to implement a formal, comprehensive integrated distribution plan (IDP) at this time. DEMEC is currently working to provide financial assistance to help members in this area.

5. Insights

The Insights section provides a comparative snapshot of Delaware's electric distribution utilities across several dimensions: system topography, energy efficiency, demand response, distributed energy resources (DER), grid-enhancing technologies (GET), and distribution planning. Table 32 compares Delaware's three EDCs in terms of customers served, energy delivered, and peak power. DPL served about 61% of Delaware's customers, delivered 51% of Delaware's electricity sales, was responsible for nearly five times the peak load of the other EDCs in 2024, while maintaining about 60% of the state's distribution circuits. DEC served about 24% of Delaware's customers and delivered about 21% of Delaware's energy in 2024 while maintaining about 15% of the state's distribution circuits. DEMEC and its collection of nine municipal utilities served the remaining 15% of Delaware's customers and delivered the remaining 28% of the state's energy in 2024 while maintaining about 25% of the state's distribution circuits. **Note: In some cases, DPL data as reported in EIA-861 does not differentiate between Delaware and Maryland service territories. In these cases, the net reported value for DPL across both states is provided and identified as such in the footnotes.**

Table 32. EDC system summary.

Utility Name	No. of Customers	Energy Sold (MWh)	Summer Peak Power (MW)	Distribution Circuits
Delmarva Power (DPL)	301,210	3,801,990	2,622 [53]	273
Delaware Electric Cooperative (DEC)	118,644	1,606,853	415	71
Delaware Municipal Electric Corporation (DEMEC)	77,400	2,114,983	472	106+
Total	497,254	7,523,826	-	450+

System Topography

Table 33 summarizes the topography of each of the EDCs' or members' systems. DPL stands out for its scale, operating 273 circuits in a hybrid radial and networked configuration, while DEC and DEMEC members manage smaller, predominantly radial systems. Voltage optimization is widely deployed in DEC and some DEMEC cities, supporting both reliability and efficiency objectives.

Table 33. System topography summary.

Utility Name	Distribution Circuits	Circuit Configuration	Circuits with Voltage Optimization
Delmarva Power (DPL)	273	Hybrid (radial + networked)	N/A
Delaware Electric Cooperative (DEC)	91	Radial	76

[53] EIA Form 861. Based on 63.5% of total DPL load. Percentage estimate provided by DPL.

City of Dover (DEMEC)	52	Not reported	47
Town of Middletown (DEMEC)	9	Not reported	9
City of Milford (DEMEC)	11	Not reported	0
City of Newark (DEMEC)	34	Not reported	0

Energy Efficiency and Demand Response

Table 34 summarizes the energy efficiency (EE) performance of each of the EDCs' systems in 2024. DPL shows the largest incremental energy savings as a portion of total load followed by DEMEC and then DEC. Notably, DPL and DEMEC members performed nearly in line with the national median incremental energy savings as a portion of total load of approximately 0.5%.

Table 34. Energy efficiency (EE) summary [54].

Utility Name	2024 Incremental EE Savings (MWh)	2024 Total Load (MWh)	2024 Incremental EE as % of Load
DPL[55]	19,233	3,801,990	0.51%
DEC	464	1,606,853	0.03%
DEMEC [56]	3,078	726,739	0.42%

Table 35 summarizes the demand response performance of each of the EDCs' or members' systems in 2024. DEC shows the largest fraction of demand response load to summer peak load, followed by DEMEC (select members) and then DPL. Notably, both DEC and DEMEC (select members) outperform the national median fraction of demand response load to summer peak load of approximately 2%.

Table 35. Demand response summary [52].

Utility Name	2024 Actual Demand Response (MW)	2024 Summer Peak (MW)	Demand Response Fraction of Summer Peak (%)
DPL	40.0	2,622 [57]	1.53% [58]
DEC	33.7	460	7.33%
DEMEC (Dover, Middletown, Newark)	21.8	472.9	4.6%

[54] Summarization of EIA-861 data
[55] DPL DE only
[56] Newark and Middletown only
[57] Estimated as 63.5% of total DPL load. Percentage estimate provided by DPL.
[58] Estimated

Distributed Energy Resources

Table 36 summarizes the distributed energy resource (DER) deployment of each of the EDCs' or members' systems through 2024. DEC shows the largest fraction of distributed energy resource capacity to summer peak load, followed by DEMEC (select members) and then DPL. All Delaware EDCs have performed above the national median fraction of DER capacity to summer peak load of approximately 3%.

Table 36. DER summary [59].

Utility Name	2024 DER Capacity (MW)	2024 Summer Peak (MW)	DER Fraction of Summer Peak (%)
DPL	110	2,622[60]	4.2%[61]
DEC	38.2	460	8.3%
DEMEC (Dover, Middletown, Newark)	20.24	472.9	4.3%

Grid Enhancing Technologies

Table 37 summarizes the grid enhancing technology (GET) deployment of each of the EDCs' systems. All EDCs are advancing grid-enhancing technologies, with AMI fully deployed at DEC and most DEMEC members, and DPL progressing on advanced distribution management and automation.

Table 37. GET summary.

Technology	DPL	DEC	DEMEC
AMI	Advanced	Fully deployed	6/9 full, 1 in progress
DERMS/ADMS	ADMS in progress	DERMS in use, ADMS/OMS integrated	Varies by member
Distribution Automation	ASR, smart sensors, substation modernization	Smart sensors, SCADA-linked, Voltage optimization	Voltage optimization (Dover, Middletown)
Hosting Capacity	Dynamic line rating	Public map, studies	Not specified
Battery/Microgrid	Community solar pipeline	7 MW battery planned	Feasibility studies (Milford)
Other Notable GETs	Fiber communications, SSN Mesh	CVR, ToU, managed EV charging	Microgrid (Smyrna), AMI joint venture

[59] Summarization of EIA-861 data
[60] Estimated as 63.5% of total DPL load. Percentage estimate provided by DPL.
[61] Estimated

Distribution Planning

Table 38 summarizes the distribution planning practices of each of the EDCs' systems. Planning horizons and practices vary, with DPL updating annually, DEC every four years, and DEMEC members as needed, reflecting differences in organizational structure and resource availability.

Table 38. Distribution planning summary.

Utility Name	DPL	DEC	DEMEC
Planning Horizon	10-year forecast (TYF) 2-year forecast Quarterly Work Plan (QWP)	6 years	As needed
Update Frequency	TYF issued annually (Oct–Apr/May cycle). 2-year forecast updated on alternating feeder cycles.	Every 4 years	Varies by member
Tools	CYME, DSP, implementing LoadSEER	Windmill, e-Tap, Pole Foreman	Varies by member, Proceeding to CYME
EV/DER Consideration	DER integration focus Hosting capacity studies (future, spatial method in LoadSEER) DERMS exploration Smart charging programs Demand response integration	Limited (excludes EV growth)	N/A

6. Project Status Update

Objective

This section of the report provides an overview of data collection to date and discusses both the feasibility of conducting the study in line with the originally proposed methodology and the potential for achieving the outcomes outlined in HJR3 and the RFP.

Background

Figure 18 provides an overview of the originally proposed analysis methodology. The proposed methodology begins with, and relies upon, developing a base case power-flow model. A power flow model, a mathematical representation of an electrical grid, is an industry standard tool used for analyzing how power moves through transmission and distribution lines and components under various generation and load scenarios. This methodology depends on the delivery of power flow models covering each of Delaware's electricity distribution companies' (EDCs) most relevant areas to form the basis of the state's current distribution infrastructure status. This base case would then be modified to analyze the impact of planned projects introduced through the EDC's long range distribution plans (LRDPs), the 40101(d) program, GEAC recommendations, and grid enhancing technology (GET) opportunities. By establishing a base case, in a uniform modeling environment, and then evaluating the addition of future projects, program benefits (electricity cost suppression, reliability, performance, safety, sustainability, etc.) to Delaware's electricity distribution grid may be understood and compared, quantitatively.

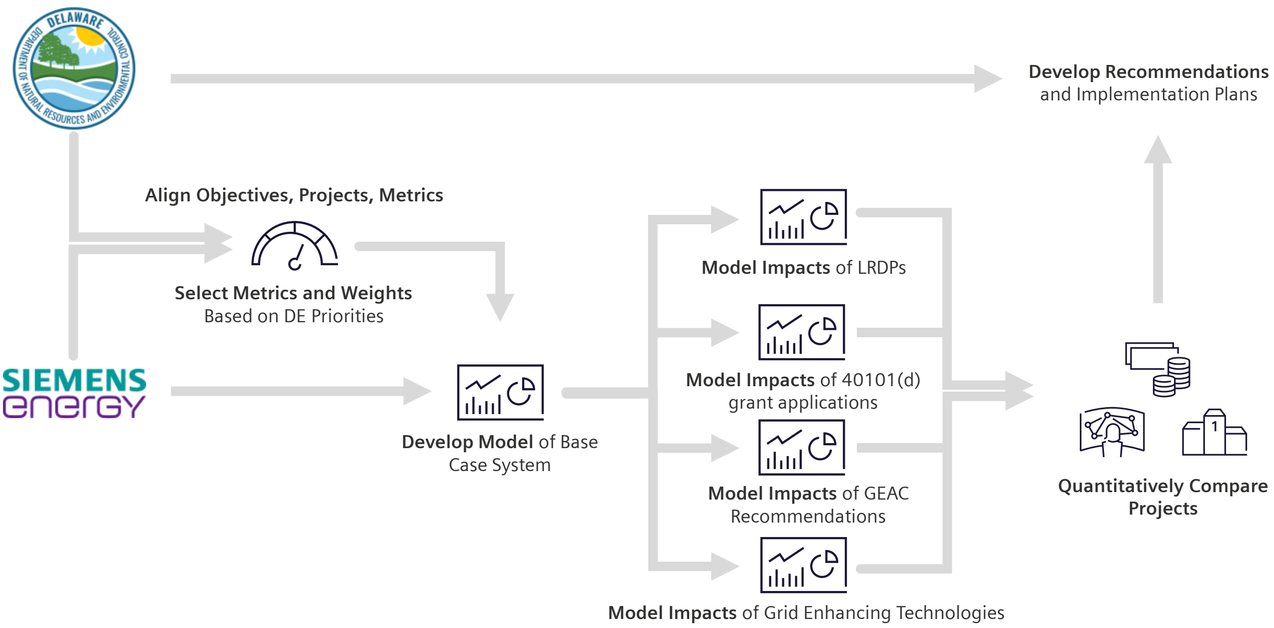

Figure 18. Proposed methodology for analysis of Delaware's electricity distribution grid.

The originally proposed methodology requires key information from the EDCs. To obtain this information, Siemens Energy initiated the Analysis of Delaware's Electricity Distribution Grid project with Electric Distribution Companies (EDCs) by conducting kickoff meetings on November 5th and 6th, 2025. During these sessions, Siemens Energy provided a comprehensive project overview and distributed a Request for Information (RFI) to all participating EDCs. Key components of this RFI are included in Table 39.

Table 39. RFI overview.

Topic	Request	Purpose	Importance
Distribution System	Power flow models, Single Line Diagrams (SLDs), equipment ratings and configurations, outage data, reliability metrics	Develop a base-case power flow model which will serve as a baseline to evaluate impacts and benefit/costs of various projects including LRDPs, 40101(d) applications, GEAC recommendations and Grid Enhancing Technologies (GETs)	Critical. Either the power flow models themselves or this supporting information is required to conduct the study using the proposed methodology
Cybersecurity	Key cybersecurity policies and practices, compliance and audit records	Prepare an analysis of EDC's cybersecurity policies and postures and make recommendations to improve system resiliency against cybersecurity threats	High. This information is not otherwise available in public sources.
Distribution Planning Process and GET Adoption	Distribution planning process; adoption of various Grid Enhancing Technologies	Understand the current (base) case process and state of technology	High. This information is not available publicly, especially for Co-Ops and municipals.
Other Planning and Forecasting	Historic loads; Existing load forecasts; Historic and forecast EE, DR, DER and EV loads; Planned projects	Develop various scenarios against which the projects would be tested.	Medium. System level forecasts can be obtained from third-parties like PJM, NERC etc. or can be developed internally. EDC provided forecasts are more locationally detailed.
Billing and Socio-economics	Service territory boundaries, customer counts by type, billing data (kWh, kW etc.), existing DERs	Develop baseline conditions and provide fundamental understanding of Delaware's Distribution System	Medium. Can be partially obtained from public sources FERC and EIA. EDC provided data is more granular.

Stakeholder Engagement

The project team engaged with stakeholders through the Governor's Energy Advisory Council (GEAC). The project team made a presentation at the GEAC meeting on November 14th, 2025. The presentation included an introduction to the project and discussion of key goals and priorities. Following the presentation, a survey was conducted to collect stakeholders' formal inputs on project goals and priorities. Twenty-six (26) responses were received from stakeholders between November 21st and December 4th, 2025. Each respondent reported their perceived importance of key priorities on a scale of 0-5, with five being the most important and zero being the least important. Figure 19 shows results of survey. In addition, respondents had opportunity to state other priorities and provide additional comments.

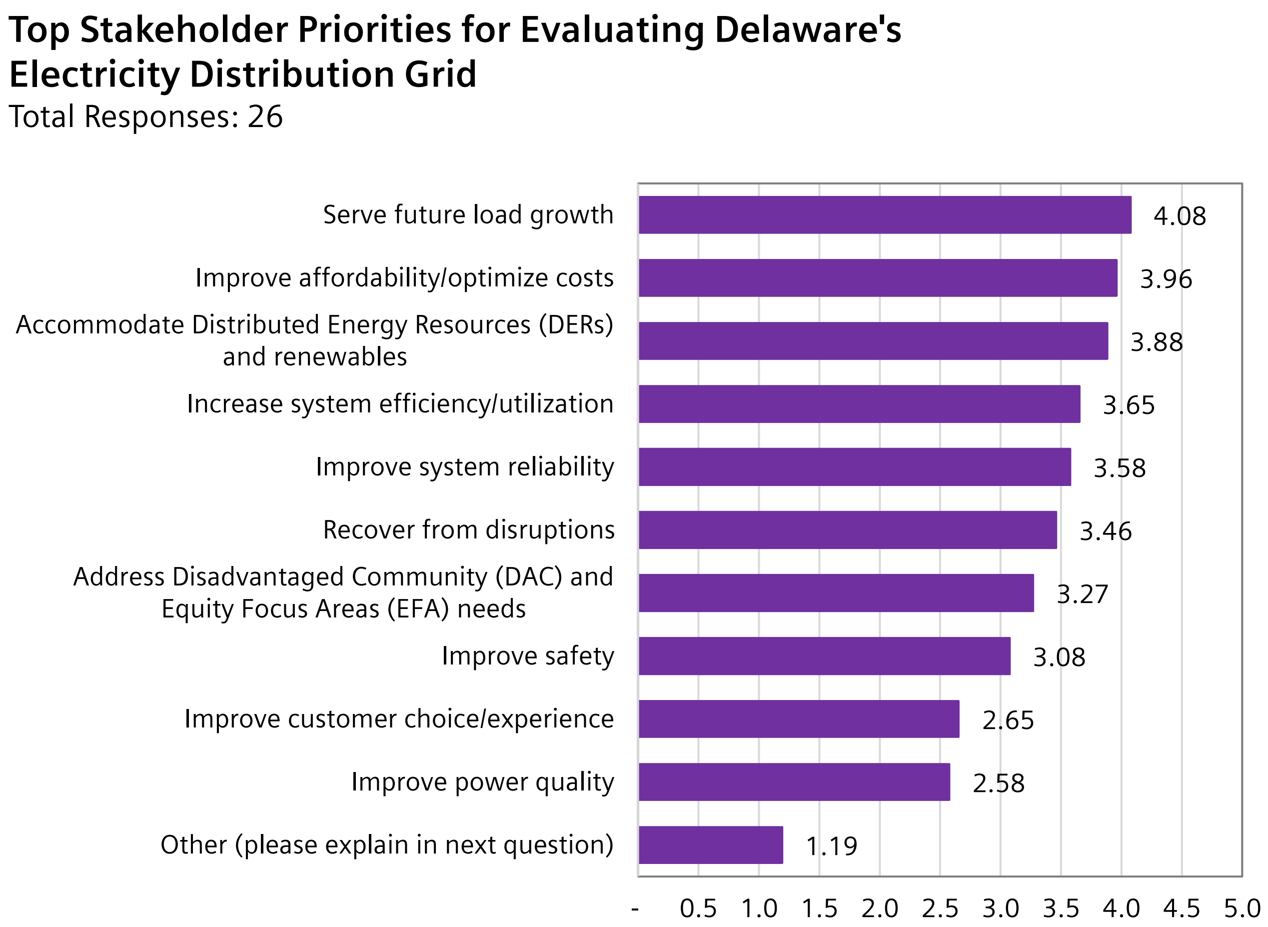

Figure 19. Stakeholder priorities.

The following key insights were obtained from the survey:

- Delaware's electricity grid stakeholders prioritized serving future load growth, improving affordability, and integrating distributed energy resources (DERs) and renewables.
- Grid modernization was seen as dependent on the integration of non-wire alternatives (NWA), DERs, DERMS, and virtual power plants, with added emphasis on climate resilience and equity for disadvantaged communities.
- Survey respondents highlighted the importance of minimizing disruptions to disadvantaged communities during weather events, expanding affordable energy access, and diversifying Delaware's energy supply.
- Stakeholder feedback emphasized that grid priorities were interdependent, with investments in DERs and renewables expected to enhance reliability and support broader goals like microgrid development and equity.

Siemens Energy will utilize these survey results to inform the development of an analytical framework for evaluating project and program benefits. The next steps include distilling the stakeholder-identified priorities into a core set of metrics that reflect the most critical evaluation criteria. These metrics will be selected to capture the highest-ranked priorities, such as serving future load growth, improving affordability, integrating DERs and renewables, enhancing climate resilience, and promoting equity for disadvantaged communities. Once these metrics are defined, Siemens Energy will align them with the overall project objectives to ensure that the analytical framework is comprehensive and directly supports the evaluation of project and program benefits. This process will culminate in the delivery of a final analytical framework that will guide the assessment of future initiatives and help measure their impact in accordance with stakeholder priorities.

Data Collection

Following the kick-off, Siemens Energy began working with the EDCs to clarify the requests within the RFI. The following reflects the status of each EDC's response to RFI and their requested participation in this program: (as of December 17th, 2025)

Delmarva Power and Light (DPL)

- Generously provided a collection of public data and reports.
- Limited its initial release of the complete data request due to privacy/security concerns.
- Pursuant to these concerns, an NDA was executed between Siemens Energy and DPL on November 24th, 2025.
- Siemens Energy has not been provided any non-public data
- DPL has declined to provide power flow model or distribution system data that will enable Siemens Energy to perform power flow analysis
- Re-affirmed commitment to assist Siemens Energy in this effort as able

Delaware Electric Cooperative (DEC)

- Generously provided a description of which data would be provided (majority public data)
- Held two discussions with project staff to provide an overview of distribution planning processes and adoption of grid enhancing technologies.
- Limited its initial release of the complete data request due to privacy/security concerns.
- Pursuant to these concerns, an NDA was proposed by Siemens Energy
- DEC declined to pursue this NDA
- Siemens Energy has not been provided any non-public data
- Re-affirmed commitment to assist Siemens Energy in this effort as able

Delaware Municipal Electric Cooperative (DEMEC)

- Generously provided a description historic sales, peak, EE, DR and DER data.
- Provided high-level description of planning/forecasting processes
- Provided information on microgrid and battery initiatives
- Provided information on generation and power purchase
- Siemens Energy has not been provided with critical information (power-flow models and cybersecurity policies and practices overview)
- Re-affirmed commitment to assist Siemens Energy in this effort as able

Table 40 summarizes the data delivered to Siemens Energy from most- to least- critical to complete the Analysis of Delawares Electricity Distribution Grid project: (as of December 17th, 2025)

Table 40. Review of data delivered to Siemens Energy.

Topic	DPL		DEC		DEMEC	
Distribution System (Power flow model)	✗	Not provided.	✗	Not provided.	✗	Not provided.
Cybersecurity Information	–	Partially provided, follow-up questions pending.	✓	Provided.	✗	Not Provided.
Distribution Planning Process and GET Adoption	✓	Provided through interview process.	✓	Provided.	–	Basic information provided. Detail needed.
Other Planning and Forecasting	–	ISR plan provided. Detail needed.	✗	Not provided.	–	Historic data provided. Detail needed.
Billing and Socio-economic	–	Not provided. Partially publicly available.	–	Not provided. Partially publicly available.	–	Partially provided.

Analysis Feasibility

Table 40 summarizes the data delivered to Siemens Energy from most- to least- critical to complete the Analysis of Delawares Electricity Distribution Grid project. In particular, distribution system data, particularly the collection of power flow models, is critical to the proposed methodology. Distribution system modeling depends on the availability of reliable base system data. This includes, but is not limited to, existing power flow models, outage records, and the distributed energy resource (DER) queue. Without this data, the detailed analysis required to fulfill the goals of the study will be severely limited.

Given the current state of data collection, and in the absence of additional data delivery, it is Siemens Energy's determination that the originally proposed methodology is ***not*** feasible. Siemens Energy therefore suggests specific alternatives which may be used to advance the aims of the project, the legislative mandate in HJR3, and the RFP in the absence of the requested information from the EDCs. Table 41 shows the deliverables as originally proposed, alongside their current data availability-impacted feasibility and where impacted, feasible alternatives.

Table 41. Deliverable feasibility.

Project Phase	Deliverable	Feasibility (based on status of data collection)	Alternative
Phase 1: Preparation & Analysis	Analytical framework	Feasible. Complete.	-
	Baseline conditions chapter of interim report	Feasible. Complete.	-

	Inventory of EDC assumptions; LRDP methodology recommendations	Inventory of EDC assumptions is **infeasible** without EDC input. LRDP methodology recommendations is **feasible** based on benchmarking of US-wide utilities	**Alternative available.** Develop of reasonable set of inputs and assumptions based on North America best-practices
	Presentation of key forecasts and boundary conditions	**Infeasible** without specific EDC inputs.	**Alternative available.** Use PJM forecast
	Comprehensive Cybersecurity Compliance Report	**Infeasible.** Actual policies and procedures must be provided.	**No alternative available**
	Cybersecurity Policy and Procedure Framework	**Partially feasible.** DEC has provided a description of policies and procedures.	**Alternative available.** Develop framework recommendations based on description of policies and discussion with EDCs
Phase 2: Modelling & Evaluation	Base power flow model results	**Infeasible** without power flow models or distribution system data described above	**No alternative available**
	Base case cost	**Infeasible** without distribution system data described above	**No alternative available**
	Updated power flow model results	**Infeasible** without power-flow model	**No alternative available**
	Benefit/cost estimates for each LRDP, 40101(d) and GEAC recommendation	**Infeasible** without power-flow model	**Alternative available.** Develop high level qualitative benefit/cost estimates based on industry standards and benchmarking (e.g. 0-5 Star ratings) or EDC projections
Phase 3: Recommendations & Reporting	Implementation Roadmap	**Partially feasible.** A roadmap can be created at higher strategic level without specific projects.	**Alternative available.** Roadmap will lay out high level strategic initiatives and goals.
	Interim report, documentation of stakeholder feedback	**Feasible**	
	Final Report	**Feasible**	

Conclusions on State of Analysis Feasibility

Based on current state of the data shared with Siemens Energy:

1. The key hurdle to delivering the originally proposed methodology is the inaccessibility of power flow models or the data that would allow Siemens Energy to develop power-flow models (including but not limited to SLDs, equipment ratings and configurations, outage data, reliability metrics etc.)

2. Without power-flow models, Siemens Energy will need to rely on high-level industry standards, benchmarking, public information, experience with other EDCs, and EDC projections.

3. Analysis of projects will be feasible but at a very high-level. This will rely on qualitative benefit and cost impacts such as (0-5 star ratings, Harvey balls [62], etc.)

4. An implementation roadmap will be partially feasible. In the absence of specific project descriptions and budgets, the roadmap will lay out high-level strategic initiatives and goals.

Siemens Energy will deliver Delaware with an objective assessment of how the state's electricity distribution grid may be made more reliable, resilient and DER deployable through various projects and their guiding programs. The originally proposed methodology would deliver quantitative results which closely match the state's electricity distribution grid's current and projected reality and develop substantiated actionable insights for policy and decision makers. The project feasibility-driven alternatives proposed in Table 41 will assist in delivering the same, but at the sacrifice of the realism only available with the EDCs' ability and willingness to share the required information.

[62] Harvey Ball Analysis uses circular icons, partially or fully shaded, to visually represent qualitative ratings for multiple items in a comparison table. It offering a quick and efficient way to understand relative performance without complex numbers

Published by

Siemens Energy
Digital Grid | Grid Consulting | Energy Transformation Consulting
Siemens Energy Inc.
4400 Alafaya Trail, Orlando, FL 32826

For more information, please visit our website
siemens-energy.com

Disclaimer

This document may contain statements relating to the future business and financial performance and future events or developments involving Siemens Energy (together with its subsidiaries, "Siemens Energy") that may constitute forward-looking statements. These statements may be identified by words such as "expect," "look forward to", "anticipate", "intend", "plan", "believe", "seek", "estimate", "will", "project" or words of similar meaning. Such statements are based on the current expectations and certain assumptions, of which many are beyond Siemens Energy's control. These are subject to a number of risks and uncertainties. Should one or more of these risks or uncertainties materialize, should decisions, assessments or requirements of regulatory authorities deviate from our expectations, or should underlying expectations not occur or assumptions prove incorrect, actual results, performance or achievements of Siemens Energy may (negatively or positively) vary materially from those described explicitly or implicitly in the relevant forward-looking statement. Siemens Energy does not intend, nor assume any obligation, to update or revise these forward-looking statements in light of developments which differ from those anticipated.

The information and opinions contained in this document are provided as at the date of this presentation and are subject to change without notice. They do not purport to contain all information that may be required to evaluate Siemens Energy and have not been verified independently. The information in this document is of a preliminary and abbreviated nature and may be subject to updating, revision and amendment, and such information may change materially.

This document contains forecasts, statistics, data and other information relating to markets, market sizes, market shares, market positions and other industry data on Siemens Energy's business and markets (together the "market data") provided by third party sources as interpreted by us. This market data is, in part, derived from published research and additional market studies prepared primarily as a research tool and reflects estimates of market conditions based on research methodologies including primary research, secondary sources and econometric modelling, which may not be representative.

Nothing contained in this document (and the appertaining verbal presentation, if any) is a warranty, guarantee or representation. All statements, data and information contained herein (and the appertaining verbal presentation, if any) are non-binding and shall not create on Siemens any commitment, obligation or liability whatsoever. Furthermore, they shall not be ground for any claim or argument, regardless whether based on this document (and the appertaining verbal presentation, if any) alone or in connection with a separate agreement or contract.