

Governor's Energy Advisory Council

Friday, November 14, 2025



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

Agenda

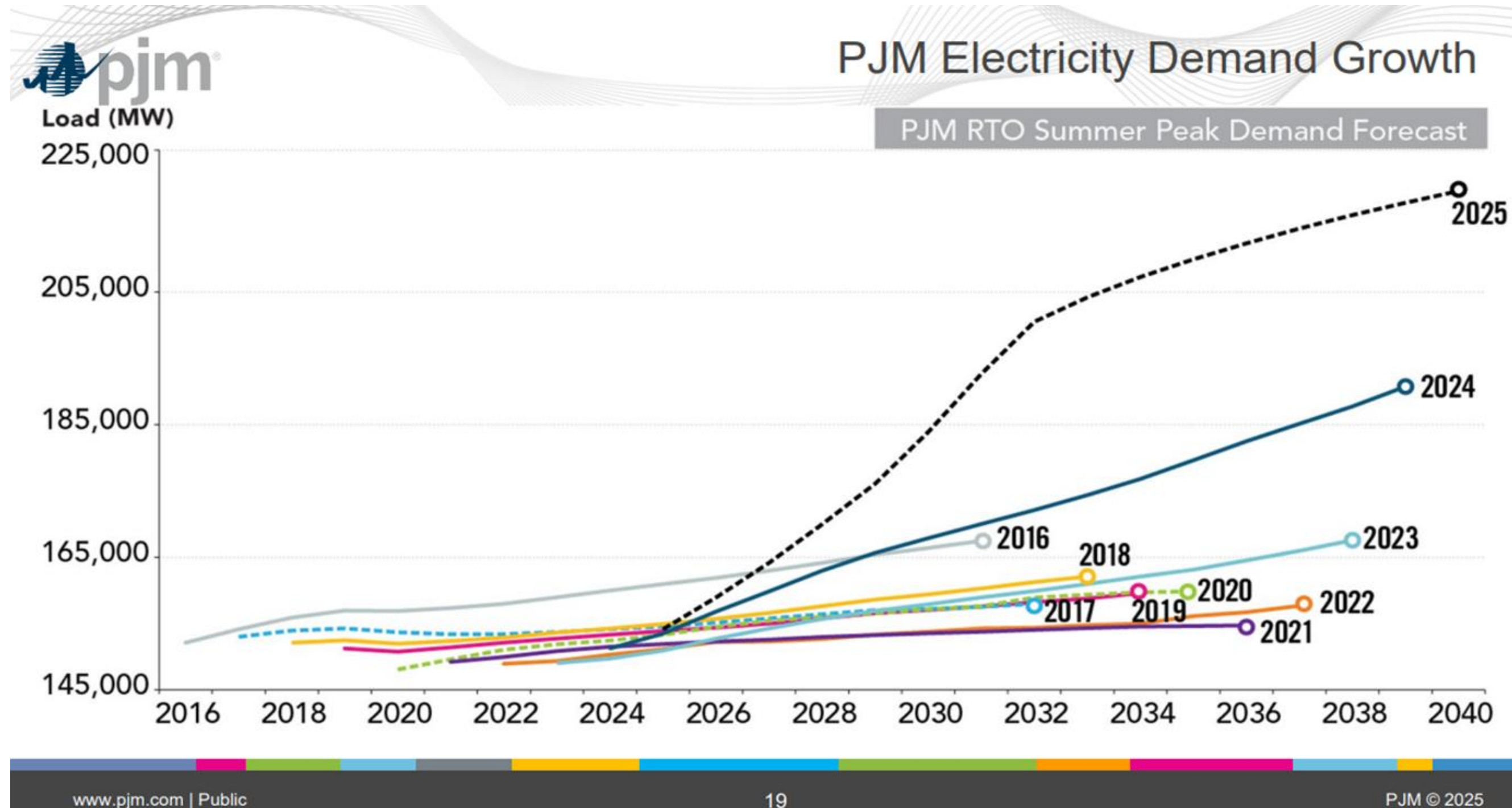
1. Roll Call of Council Members
2. Opening Remarks
3. Approval of Meeting Minutes from October 10, 2025
4. Updates from the DNREC State Energy Office, Public Service Commission Staff, and the Division of the Public Advocate
5. Discussion on Data Centers and Load Growth
6. Update on the Grid Modernization Study (status, metrics and priorities)
7. Public Comment
8. Next Council Meeting: December 12, 2025

Data Centers and Large Load Additions

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**DNREC State Energy Office
Public Service Commission Staff
Division of the Public Advocate**

Demand Growth



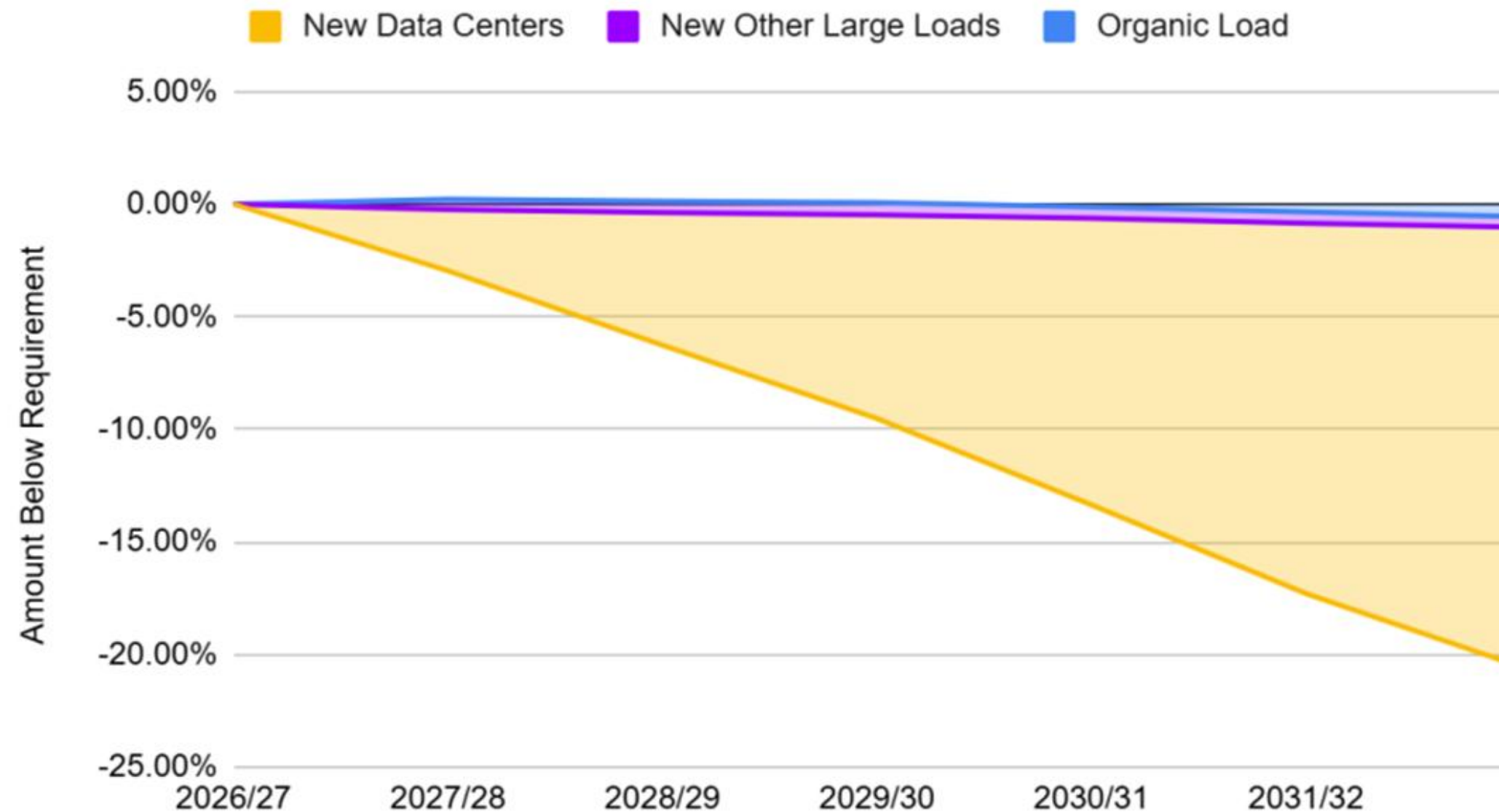
PJM Capacity Market Impact

Conclusions

The basic conclusion of this analysis is that data center load growth is the primary reason for recent and expected capacity market conditions, including total forecast load growth, the tight supply and demand balance, and high prices. But for data center growth, both actual and forecast, the PJM Capacity Market would not have seen the tight supply demand conditions, the high prices observed in the BRA for 2025/2026 or the high prices expected for the 2026/2027 and subsequent capacity auctions. Holding aside all the other issues raised by the MMU in parts A through F of this report, data center load by itself resulted in an increase in the 2025/2026 BRA revenues of \$9,332,103,858 or 174.3 percent

PJM's Reliability Gap

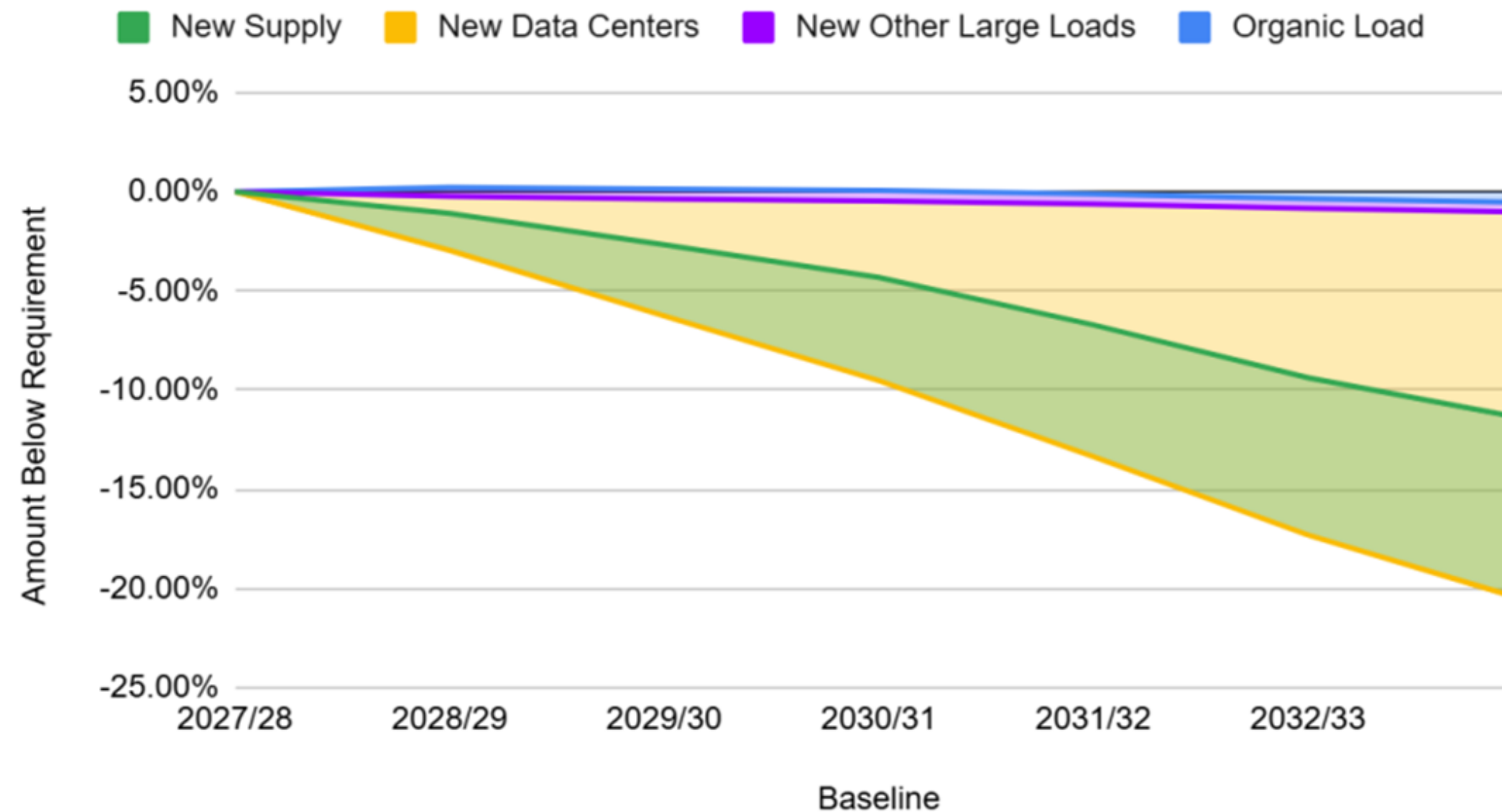
Large loads are mostly data centers



5

PJM's Reliability Gap

New supply won't be sufficient

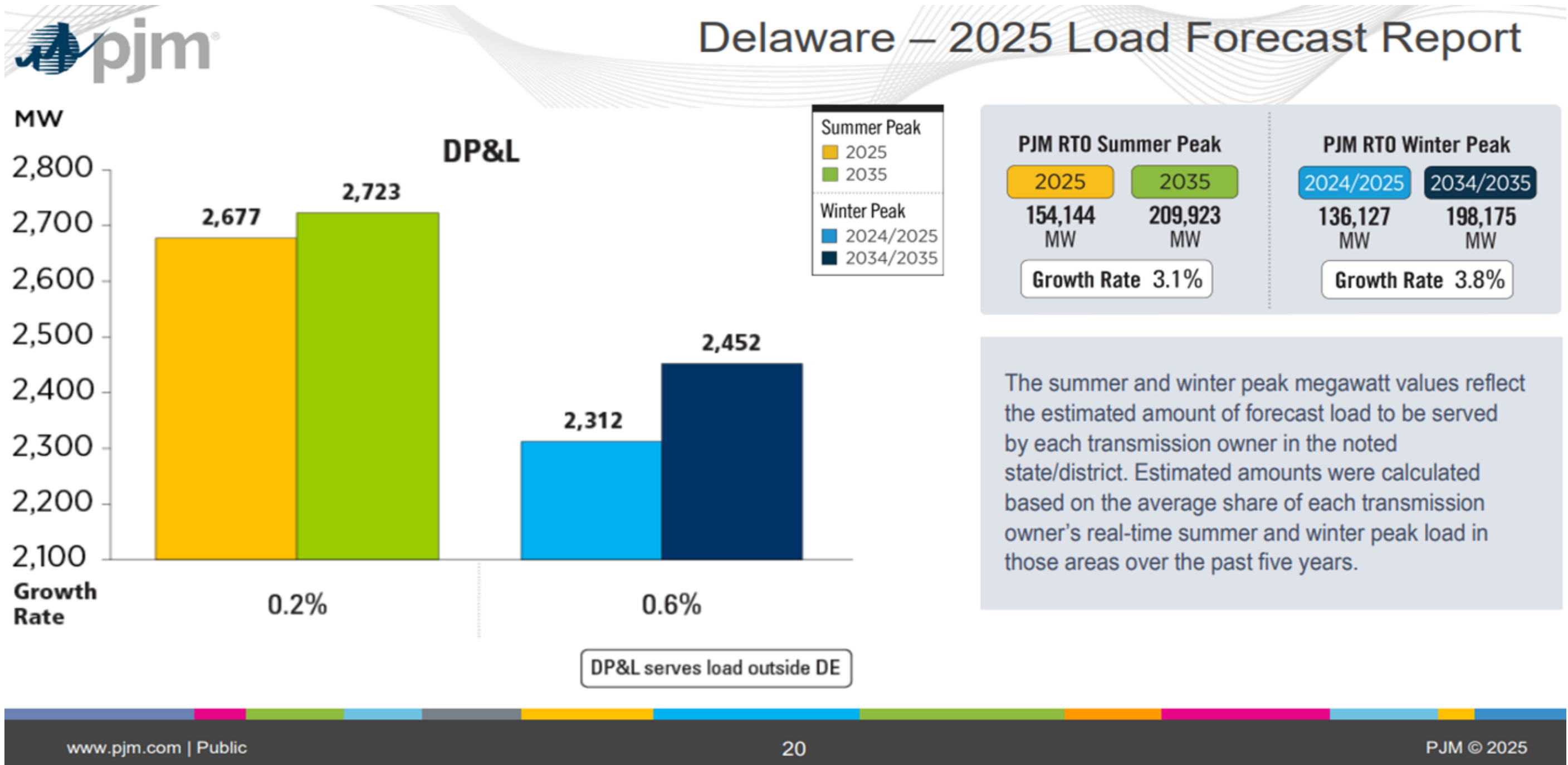


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Impact on Capacity Prices



Delaware



State Policy Levers for Data Centers

1. Improve administrative information collection & processing of data center requests
2. Clarify the right of utility regulators to tailor rates to data centers
3. Establish substantive requirements for new requests
4. Moratorium

A State Playbook for Managing Data Center-Driven Load Growth



Energy at Hopkins

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PJM Critical Issue Fast Path (CIFP) - Large Load Additions (LLA)

Purpose:

- “ensure that these large loads can continue to be integrated quickly and reliably—without compromising system resource adequacy”

Process:

- “an accelerated process to find consensus on how to integrate large load customers rapidly and reliably without risking an electricity supply shortage”

Outcome:

- “Optimally, any solution that receives consensus would be filed with [FERC] in December and would be available before the capacity auction for the 2028/2029 Delivery Year.”

PJM CFP Proposal Packages

- 12 proposals from various stakeholders with various interests
 - Should LLAs be required to BYOG before being approved for interconnection?
 - Should LLAs be interruptible? If yes, before other customer classes?
 - Improved load forecasting accuracy/confidence
 - Enhanced DR products (can DR substitute for BYOG?)
 - Expedited Interconnection Track (EIT) for LLAs that BYOG
 - Should current capacity market price cap be extended until new generation can catch up to demand? If yes, for how long? If yes, what is impact on building new generation?
- Next meeting: November 19
 - Sponsors present proposals to PJM Board of Managers
 - PJM FERC filing in December

Data Center Proposal in Delaware



Starwood Digital Ventures has proposed a data center campus south of Wilmington

- 11 buildings
- 6 million sq ft
- 580 acres
- 1.2 GW

Data Centers Policy Responses in Delaware

- PSC Docket No. 25-0826, DPL large load tariff
- HB 233 would require utilities to establish large load rate class
- SB 205 would require Certificate to Operate (“COP”) from the PSC
- NCC Ordinance 25-101 reviewed by PLUS (Preliminary Land Use Service)

Discussion



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Public Comment

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Break



DELAWARE DEPARTMENT OF
**NATURAL RESOURCES AND
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Analytical Framework Workshop

Analysis of Delaware's Electricity Distribution Grids

11/14/2025



Agenda

- 01** Project Overview
- 02** Introduction to Analytical Framework
- 03** Key Priorities and Metrics
- 04** Interim Report Outline

01 Project Overview

Project Team

Project Leadership



Project Manager
Joshua Brooks, PhD, PE

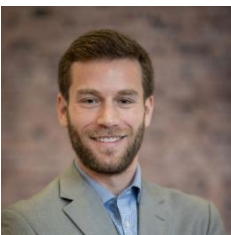


QA/QC Manager
Mubashir Bokhari

Energy Transformation Team



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Alok Patil, CFA



Consultant
Nick Kraus



Consultant
Amanda Farnsworth, PhD

Grid Analysis & Planning



Team Lead
Sassan Salem



Consultant
Maryam Hajati



Consultant
Zane Maditz

Cybersecurity Team



Cybersecurity Lead
Pascal Seguin



Consultant
Hedayat Khan

Subcontractors



Introduction

Project Background

- The Delaware Department of Natural Resources and Environmental Control (DNREC) seeks to **modernize and harden the state's electricity distribution grid**.
- This initiative is funded under the U.S. Department of Energy's **Bipartisan Infrastructure Law (BIL) Section 40101(d)** to improve grid resilience and reduce the impact of disruptive events.
- The project aligns with the **Delaware Energy Plan and the Governor's Energy Advisory Council (GEAC) recommendations** to support clean energy, resilience, and equitable access.

Project Objectives

- Assess the **current state and future needs** of Delaware's electricity distribution systems.
- Evaluate the impact of **Long-Range Distribution Plans (LRDPs), 40101(d) projects, and GEAC recommendations**.
- **Identify cost-effective strategies** to enhance grid resilience, integrate DERs, and support electrification.
- Develop a **roadmap for implementing advanced grid technologies** and non-wires alternatives (NWAs).

Our Scope

- Develop a robust **analytical framework** and **data collection plan** tailored to Delaware's grid.
- Conduct **baseline analysis** of infrastructure, DER adoption, and system performance.
- Evaluate **cybersecurity risks and recommend** defensible architecture improvements.
- Perform **power flow modeling** and **cost-benefit analysis** using CYME and PSS/E tools.
- Recommend **implementation strategies** and policy enhancements for grid modernization.
- Deliver **interim and final reports** with actionable insights and stakeholder-informed recommendations.

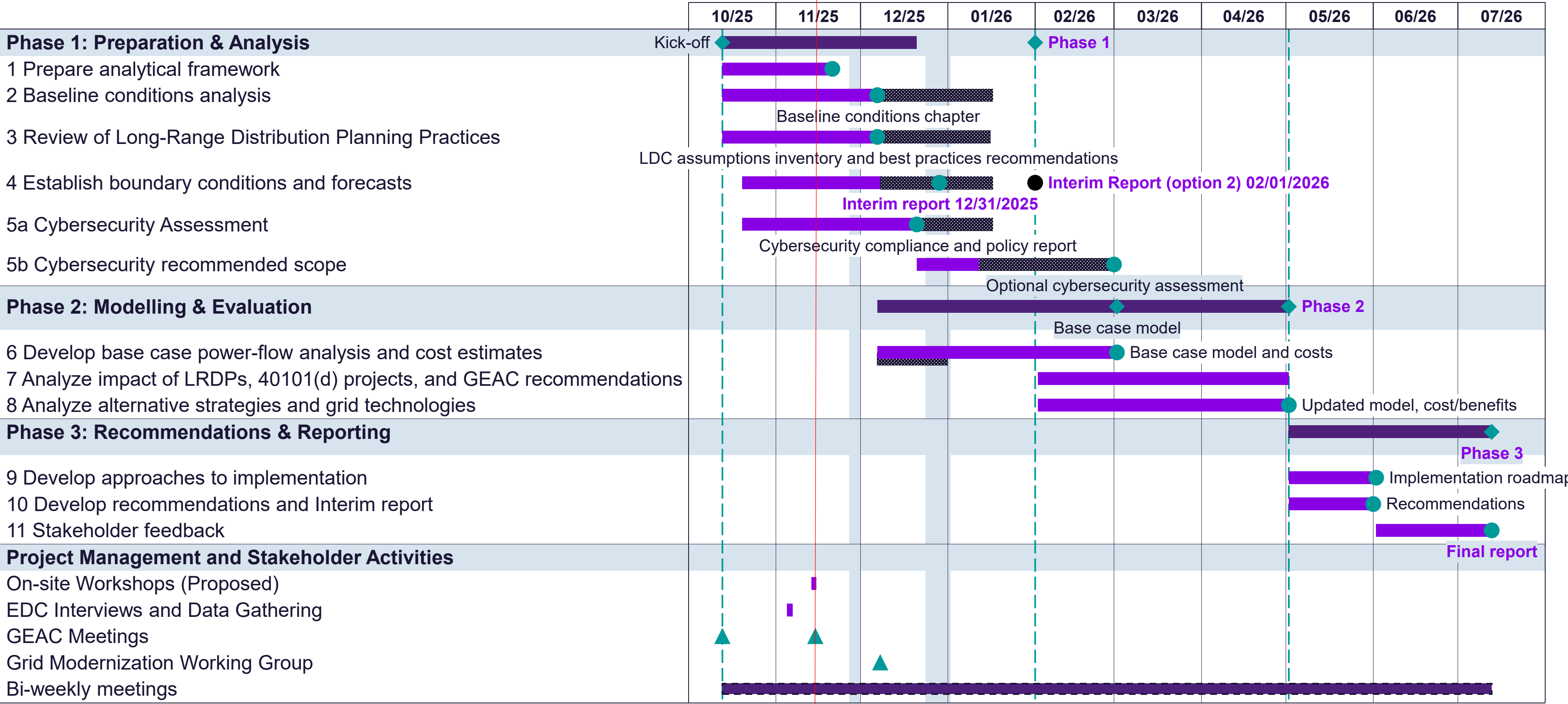
Our Approach and Methodology

Phase 1 (week 1-7) Preparation & Analysis	Phase 2 (week 8-24) Modelling & Evaluation	Phase 3 (week 24-29) Recommendations & Reporting
Goal Establish understanding of baseline conditions and lay solid framework for analysis	Goal Measure impact of various grid enhancement projects and technologies against baseline	Goal Develop actionable implementation plan in collaboration with stakeholders
Tasks 1. Prepare analytical framework 2. Baseline conditions analysis 3. Review of Long-Range Distribution Planning Practices 4. Establish boundary conditions and forecasts 5. Cybersecurity Analysis and Assessment	Tasks 6. Develop base case power-flow analysis and cost estimates 7. Analyze impact of LRDPs, 40101(d) projects, and GEAC recommendations 8. Analyze alternative strategies and grid technologies	Tasks 9. Develop approaches to implementation 10. Develop recommendations and Interim report 11. Final report
Deliverables • D1: Analytical framework & Data Freeze Report • D2: Baseline conditions chapter of interim report • D3: Inventory of EDC assumptions; LRDP methodology recommendations • D4: Presentation of key forecasts and boundary conditions • D5: Comprehensive Cybersecurity Compliance Report • D6: Cybersecurity Policy and Procedure Framework	Deliverables • D7: Base power flow model results • D8: Base case cost • D9: Updated power flow model results • D10: Benefit/cost estimates for each LRDP, 40101(d) and GEAC recommendation	Deliverables • D11: Implementation Roadmap • D12: Interim report, documentation of stakeholder feedback • D13: Final Report

Project Schedule

Legend:  Milestones  Deliverables  Meetings/stakeholder engagements

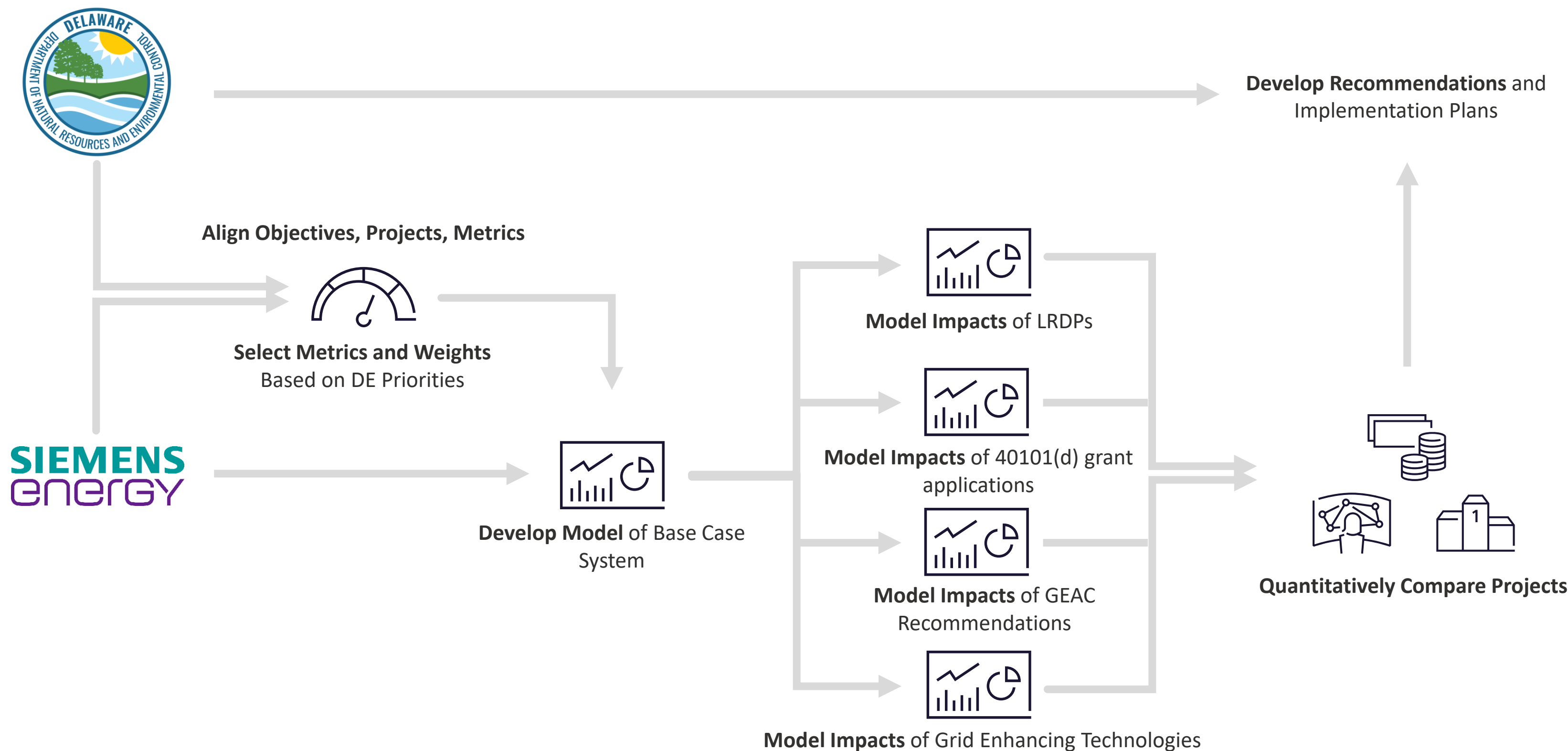
 Option 1: Original Schedule  Option 2: Extended Timeline



02

Introduction to Analytical Framework

Analytical Framework: How will we use it?

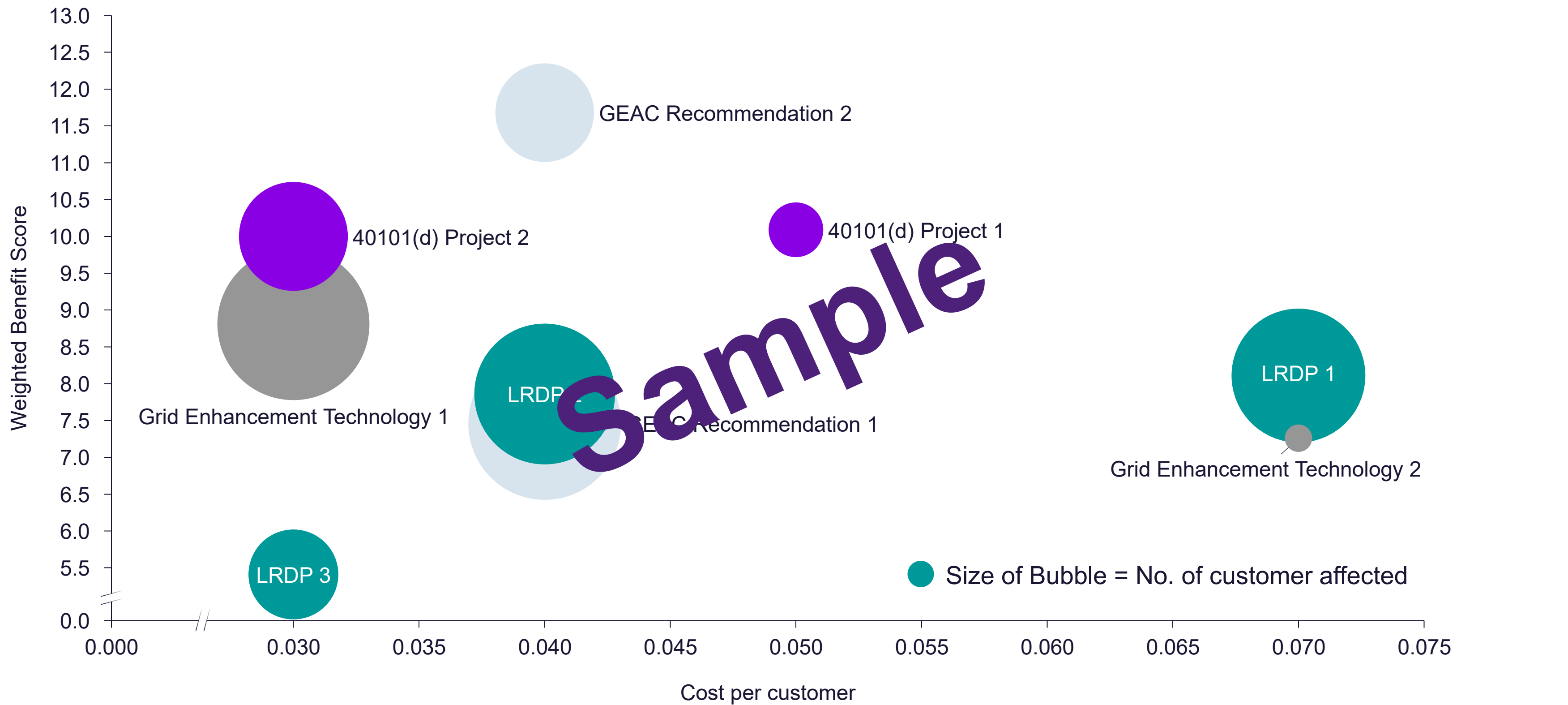


Analytical Framework: Selected metrics will be used to evaluate benefits and costs of proposed projects/plans



No.	Project	Distribution peak load capacity	Hosting capacity (MW available)	SAIDI (System Average Interruption Duration Index)	N-1 Security Index	Weighted Benefit Score (Y-axis)	Cost Metric - Rate Impact (\$/kWh) (X-axis)	No. of Customers Affected
Metric Weight		5	3	4	2			
1	LRDP 1	57%	30%	85%	48%	8.11	\$ 0.07	113,811
2	LRDP 2	75%	41%	39%	66%	7.86	\$ 0.04	125,785
3	LRDP 3	25%	30%	47%	69%	5.41	\$ 0.03	51,334
4	40101(d) Project 1	59%	72%	90%	69%	10.09	\$ 0.05	19,008
5	40101(d) Project 2	76%	76%	89%	26%	10.00	\$ 0.03	75,341
6	40101(d) Project 3	27%	80%	52%	74%	7.31	\$ 0.05	127,264
7	GEAC Recommendation 1	79%	35%	40%	43%	7.46	\$ 0.04	148,169
8	GEAC Recommendation 2	82%	90%	81%	82%	11.68	\$ 0.04	61,725
9	Grid Enhancement Technology 1	40%	73%	78%	75%	8.81	\$ 0.03	147,009
10	Grid Enhancement Technology 2	52%	48%	63%	35%	7.26	\$ 0.07	4,776

Analytical Framework: Visualization of results



03

Key Priorities

Discussion: What are key priorities for Delaware’s Grid?

Objectives	Proposed Objective Weight	Relevant Project Examples
Serve future load growth	To be discussed	Transformer upgrades, Circuit reconductoring
Improve system reliability		Automated circuit breakers and recloser, Storm hardening, Feeder sectionalization
Recover from disruptions		Fault Location Isolation and Service Restoration (FLISR), OMS, Back-ties
Accommodate DERs and renewables		Hosting capacity studies, Smart inverter integration, Distributed Energy Resource Management System (DERMS)
Improve power quality		PQ monitoring, Line voltage regulators, Flexible AC Transmission System (FACTS)
Increase system efficiency/utilization		Volt/VAR Optimization (VVO) projects, Advance Demand Response
Improve safety		Fault current indicator (FCI), Line inspection, Vegetation management programs
Improve affordability/optimize costs		Non-Wires Alternatives (NWA) BESS, Energy efficiency
Improve customer choice/experience		Dynamic pricing, Community solar
Address DAC and EFA needs		Microgrids, Targeted EV Programs, Community solar
Other (TBD)		

Selection of Metrics: Siemens Energy will choose metrics set of metrics to reflect Delaware’s priorities

Objectives	Benefit Metrics													Cost Metrics								
	Peak Load Capacity (MW)	Average circuit loading (%)	Average Feeder Headroom (%)	SAIDI	SAIFI	CAIDI	Maximum Hosting capacity (MW)	Maximum DER penetration (MW)	Reverse power flow events (#)	Contingency violations (#)	Cyber security response time	System restoration time	Voltage support needs (#)	Frequency support needs (#)	Capacity/Load Factor	Technical losses	OSHA recordable incidents	CapEx (\$/cust.)	OpEx (\$/cust.)	Lifecycle cost (\$/cust.)	Deferred Capital Expenditure (\$/cust)	Rate Impacts (\$/kWh)
Serve future load growth	Primary metric	Primary metric	Primary metric																			
Improve system reliability				Primary metric	Primary metric	Primary metric																
Accommodate DERs and renewables	Secondary impact	Secondary impact	Secondary impact				Primary metric	Primary metric	Primary metric													
Recover from disruptions										Primary metric	Primary metric	Primary metric										
Improve power quality													Primary metric	Primary metric								
Increase system efficiency/ utilization															Primary metric	Primary metric						
Improve safety																	Primary metric					
Improve affordability/optimize costs																Secondary impact		Primary metric	Primary metric	Primary metric	Primary metric	Primary metric
Improve customer choice/experience				Secondary impact	Secondary impact	Secondary impact	Secondary impact	Secondary impact	Secondary impact													
Other (TBD)																						
Legend: Primary metric Secondary impact																						

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Analytical Framework will reflect objectives and select metrics that will be used for evaluation of projects/plans

Objectives	Proposed Objective Weight	KPI Metrics
Serve future load growth	12345	Distribution Peak Load Capacity (MW)
		Average circuit loading (%)
		Average Feeder/Substation Headroom (%)
Withstand Disruptions	12345	SAIDI (System Average Interruption Duration Index)
		SAIFI (System Average Interruption Frequency Index)
		CAIDI (Customer Average Interruption Duration Index)
Accommodate DERs and Renewables	12345	Maximum Hosting Capacity (MW)
		Maximum DER Penetration Rate (% of load)
		Reverse Power Flow Events Count
Enhance Grid Resilience and Security	12345	N-1 Contingency Violations
		Cybersecurity Response Time
		System Restoration Time
Minimize cost and optimize investment	12345	Avoided Capital Expenditure (\$/yr)
		Rate Impacts

Public Comments

04

Interim Report Outline

Baseline Conditions Analysis (Interim Report) Outline

01	Introduction	➔	1. Background to the project and scope 2. Explain purpose for baseline conditions report 3. Methodology and Data Sources
02	Overview of Delaware EDC	➔	1. Overview of DPL, DEC and DEMEC (service territory maps, number of customers, regulated status etc.) 2. Overview of transmission, gas pipelines, generation and storage facilities
03-05	EDC Detailed Profiles: DPL, DEC and DEMEC	➔	1. System Overview: Customer #, kWh and kW by class and voltage; Peak MW, DER (MW) 2. System Topography: No. of circuits, voltages, substations, conductor miles 3. Asset Management and Performance: Discussion of asset management practices and programs, system reliability performance (SAIDI/SAIFI), Worst performing circuits 4. Distribution Planning: Discussion of approach, methodology, and tools 5. Technology Adoption: Maturity levels in adoption of key OT/IT and innovative technologies
06	Comparison and Insight	➔	1. Comparative summary of 3 EDCs on each of the 5 topics described above 2. Comparison to national averages or best practices 3. Key insights 4. Feasible outcomes based on data availability

Data available publicly Data partially available Contingent on data provided by EDCs

Thank you



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Next Council Meeting:
Friday, December 12, 2025
9:00 AM

Delaware Department of Agriculture



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