VERSANT POWER

INTEGRATED GRID PLAN

Planning a Resilient Grid for a Sustainable Future

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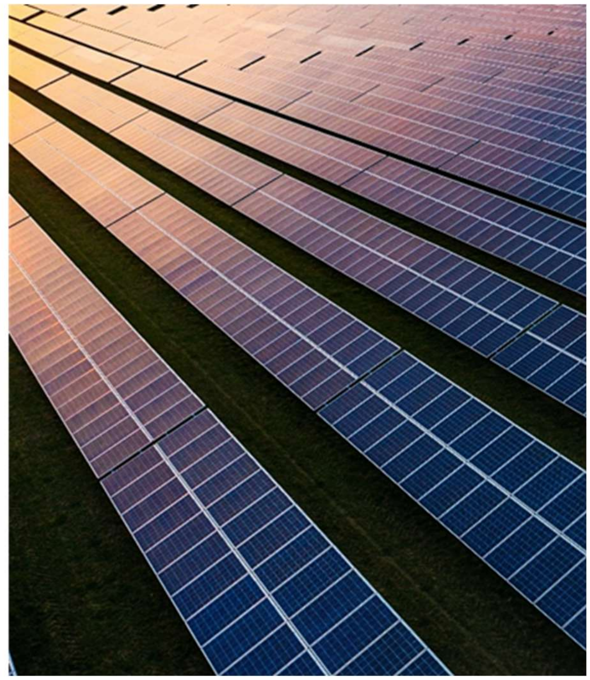

ACKNOWLEDGEMENTS

Versant Power would like to thank the numerous people who have shaped and informed Maine's Integrated Grid Planning process over the past few years. Feedback received from members of the public at community meetings, advocates and technical experts during stakeholder engagement sessions and one-on-one meetings, and partners in state government all helped to make this plan stronger.

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ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS REFERENCE GUIDE	
ABBREVIATION	DEFINITION
ADMS	Advanced Distribution Management System
AIC	Akaike Information Criterion
AMI	Advanced Metering Infrastructure
ARIMAX	Auto Regressive Integrated Moving Average with Exogenous Variables
BESS	Battery Energy Storage Systems
BEVs	Battery Electric Vehicles
BHD	Bangor Hydro District
BTM	Behind-the-Meter
CAGR	Compound Annual Growth Rate
CDD	Cooling Degree Days
CEJST	Climate and Economic Justice Screening Tool
CELT	Capacity, Energy, Loads, and Transmission
CIS	Customer Information System
CMP	Central Maine Power
CVR	Conservation Voltage Reduction
DER	Distributed Energy Resource
DERMS	Distributed Energy Resource Management System
DOER	Department of Energy Resources
DG	Distributed Generation
DWD	Germany's National Meteorological Service
EE	Energy Efficiency
EEEJ	Environmental, Equity, and Environmental Justice
EEI	Edison Electric Institute
EMs	Electric Motorcycles
EMT	Efficiency Maine Trust
EV	Electric Vehicle
EVI-Pro	Electric Vehicle Infrastructure Projection Tool
FERC	Federal Energy Regulatory Commission
FLISR	Fault Location, Isolation, and Service Restoration
FTM	Front-of-the-Meter
GETs	Grid-Enhancing Technologies
GHG	Greenhouse Gas
GIS	Geographic Information System
HDD	Heating Degree Days
HEVs	Hybrid Electric Vehicles

ACRONYMS AND ABBREVIATIONS REFERENCE GUIDE	
ABBREVIATION	DEFINITION
ICA	Integrated Capacity Analysis
IGP	Integrated Grid Plan
IIJA	Infrastructure Investment and Jobs Act
IRA	Inflation Reduction Act
ISO-NE	ISO New England
kVA	Kilovolt-Amperes
kVAR	Kilovolt-Amperes Reactive
kW	Kilowatt
kWh	Kilowatt-Hours
MAPE	Mean Absolute Percentage Error
MPD	Maine Public District
MPUC	Maine Public Utilities Commission
MW	Megawatt
MWW	Maine Won't Wait Annual Report
NB Power	New Brunswick Power
NEB	Net Energy Billing
NEVs	Neighborhood Electric Vehicles
NMISA	Northern Maine Independent System Administrator
NOAA	National Oceanic and Atmospheric Administration
NREL	National Renewable Energy Laboratory
NWA	Non-Wires Alternative
O&M	Operations and Maintenance
OMS	Outage Management System
OPA	Office of the Public Advocate
PHEVs	Plug-in Hybrid Electric Vehicles
POI	Point of Interconnection
PSS®E	Power System Simulator for Engineering
PV	Photovoltaic
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
STATCOM	Static Synchronous Compensator
T&D	Transmission and Distribution
TO	Transmission Operator
VVO	Volt-VAR Optimization

EXECUTIVE SUMMARY

Versant Power (Versant or the Company) is planning the electric grid of tomorrow. In doing so, the Company is embracing new opportunities and confronting new challenges. Some of these are common to all utilities engaged in rapid energy transitions, and others are more specific to Maine's unique energy system or to Versant's service territory.

Versant is focused on long-term planning designed to navigate and accommodate increasingly complex environmental and policy factors alongside traditional imperatives such as safety and reliability. Maine has committed to climate and energy goals that are among the most ambitious in the nation, including rapid decarbonization of electricity supply and adoption of beneficial electrification technologies.

Our state has made significant progress toward many of these goals, especially in adopting distributed energy resources (DERs) and transitioning to energy efficient heat-pumps. There is significant work ahead of us and achieving these goals—while maintaining safety, reliability and affordability for customers—will require careful planning, strategic investments, and collaboration.

Versant Power is committed to cost-effectively facilitating the energy transitions underway in Maine and puts forward the following Integrated Grid Plan (IGP) as an important step toward accomplishing the vision Maine has set forth for a clean, reliable, and sustainable energy future.

KEY QUESTIONS

IN MANY WAYS, UNDERSTANDING HOW MAINE'S ELECTRIC GRID CAN COST-EFFECTIVELY FACILITATE THE ACHIEVEMENT OF THESE ENVIRONMENTAL AND POLICY GOALS—WHILE MAINTAINING OR IMPROVING RELIABILITY AND RESILIENCE—HAS SHAPED THE STATE'S FIRST INTEGRATED GRID PLANNING PROCESS.

Versant developed its IGP to meet the priorities outlined in the Maine Public Utilities Commission's (MPUC) July 2024 Order (MPUC Order) initiating the utility planning process.[1] These priorities focus on ensuring reliability and resilience, cost-effectively achieving the State's climate and greenhouse gas (GHG) reduction goals, improving data quality and integrity, and enabling flexible management of consumer resources with active customer involvement. While the Order includes additional requirements, these three priorities—shaped through significant stakeholder input—form the foundation of this first IGP iteration and have guided Versant's approach.

At its core, the IGP seeks to understand how Maine's electric grid can support environmental and policy objectives cost-effectively while maintaining or improving reliability and resilience. Recognizing these priorities, Versant's IGP seeks to answer three foundational questions, as follows:

[1] *Proceeding to Identify Priorities for Grid Plan Filing*, Order, Docket No. 2022-00322 (July 12, 2024) (MPUC Order).

WHAT INVESTMENTS WILL BE NECESSARY TO FACILITATE THE ACCOMPLISHMENTS OF MAINE'S STATUTORY GOALS WHILE KEEPING COSTS AFFORDABLE AND MAINTAINING OR IMPROVING RELIABILITY?

Versant believes the accomplishment of state policy goals is intentionally and appropriately linked with the maintenance or improvement of reliability and resilience, and a focus on affordability for customers. For that reason, solutions to grid needs necessary to facilitate the accomplishment of state policy goals must, at a minimum, maintain current levels of reliability and resilience. Solutions must also be cost-effective, meaning that they should be the least-cost, best-fit solution to a given need.

HOW CAN VERSANT USE DATA TO ENHANCE SYSTEM PLANNING AND MAKE THIS INFORMATION MORE ACCESSIBLE TO STAKEHOLDERS WHO MAY COLLABORATE ON POTENTIAL SOLUTIONS?

Versant can enhance system planning by leveraging the extensive data and insights gained through the IGP, which provides a long-term view of grid needs and highlights the work required under various future scenarios. By prioritizing transparency and making this information accessible, Versant can enable stakeholders to collaborate on innovative, cost-effective solutions, including non-traditional approaches to addressing grid challenges. The Company views the IGP as a valuable resource for ongoing engagement and welcomes continued collaboration to ensure the best outcomes for both near- and long-term planning.

WHAT FOUNDATIONAL CAPABILITIES MAY BE NEEDED TO ENABLE THE INTEGRATION OF ELECTRIFICATION TECHNOLOGIES AND DERS, EMPOWER CUSTOMERS WITH INFORMATION TO MANAGE THEIR ENERGY, AND SIMULTANEOUSLY BENEFIT THE GRID?

To enable the integration of electrification technologies and Distributed Energy Resources (DERs) while empowering customers to manage their energy and support the grid, foundational capabilities must include advanced technologies and strong collaboration. Versant is planning for tools such as Advanced Distribution Management Systems (ADMS), Distributed Energy Resource Management Systems (DERMS), grid-enhancing technologies (GETs), flexible interconnection practices, and energy storage, all of which will play critical roles in future operations. As a utility in a deregulated state, Versant recognizes that achieving these goals requires alignment among multiple stakeholders, including Efficiency Maine Trust (EMT), third-party energy suppliers and aggregators, ISO New England (ISO-NE), the Northern Maine Independent System Administrator (NMISA), and customers themselves. Versant is committed to working with these partners to implement cost-effective solutions that reliably meet evolving grid needs identified in the IGP.

AN INTEGRATED CAPITAL INVESTMENT APPROACH

Historically, Versant has balanced asset management, reliability improvement, and resilience in developing its system plans. More recently, climate, including Versant's first Climate Vulnerability Assessment project, has become more central to the Company's planning processes.[2] Moving forward, IGP-identified needs will provide another important input to Versant's planning, with most IGP-identified projects anticipated to fit within the "capacity" investment category. Table ES-1 summarizes the categories and programs that comprise the Company's capital investment strategy.

[2] As part of its ongoing planning as required by Sec. 7. 35-A MRSA §3146 (Climate change protection plan), Versant Power has developed a Climate Change Resilience Plan (2023) and a Climate Vulnerability Study (2024). *Versant Power Climate Change Resilience Plan*, Versant Power (Dec. 2023), https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/ViewDoc.aspx?DocRefId=%7b0040B68C-0000-C11E-BB81-2A4DDFDD0014%7d&DocExt=pdf&DocName=%7b0040B68C-0000-C11E-BB81-2A4DDFDD0014%7d.pdf; *Versant Power Climate Change Vulnerability Study*, Versant Power (Dec. 2024), https://www.versantpower.com/docs/default-source/environmental/12-20-2024-versant-ccvs-report-v1.pdf?sfvrsn=34fbaa1a_1.

TABLE ES-1 – VERSANT'S INTEGRATED CAPITAL INVESTMENT APPROACH		
Investment Category	Investment Objective	Example Capital Investment Programs
1. Reliability	Improve reliability relative to the baseline 5-year trend for post-exclusion indices	• Fault Location, Isolation, and Service Restoration (FLISR) • Protection & Coordination • Reliability Request Projects • Covered Conductor
2. Resilience	Improve the ability of the system to withstand and recover from severe events. for post-exclusion indices	• Storm Hardening • Improved Standards • Undergrounding
3. Asset Health	Maintain health of aging assets to prevent reliability degradation and mitigate safety issues	• Distribution Rebuilds Per Inspection • Copper Replacement • Other Age/Condition-based Replacement
4. Capacity	Upgrades to accommodate load growth, enabling Maine's clean energy goals through beneficial electrification	• **IGP-Identified Projects** • Cutover/Criteria/Violation Projects
5. Enabling Technology	Enable broad grid modernization with key foundational technologies	• Advanced Metering Infrastructure (AMI) • Advanced Distribution Management System (ADMS) • Geographic Information System (GIS)
6. Other	Facilities, fleet, and other capital investments	• Facility and Fleet • Support Versant's EV Fleet Adoption

Reliability, resilience, asset health, and capacity investments are targeted to address identified grid needs at the circuit level. Other investments, such as those to support customer and developer-funded interconnections of DERs and large loads, remain an important part of Versant's strategic plan. With an integrated capital planning approach, the utility can assess grid needs across multiple investment categories at the circuit level, leading to potential cost efficiencies.

'NO REGRETS INVESTMENTS'

Versant defines "no regrets investments" as strategic actions that deliver value across multiple grid and customer needs simultaneously. The best "no regrets" solution may not align completely with a single driver of utility investment strategy. For example, the IGP might identify a need for additional circuit capacity to support beneficial electrification and propose upgrading a transformer to the next size. However, when considering other priorities—such as reliability or resilience—Versant may determine that a battery energy storage system at the local substation offers greater overall value.

By taking a holistic view of system needs, Versant anticipates that non-traditional solutions will play an increasingly significant role. In some cases, these solutions may serve multiple purposes more cost-effectively than traditional approaches. Versant is committed to rigorously evaluating and advancing such options whenever they deliver the greatest benefit to customers and the grid.

IGP SCOPE

The IGP is a powerful tool for identifying potential long-term grid needs and the solutions that may best meet them. By itself, the IGP is not a set of specific project proposals or a cost-recovery mechanism. Versant expects to bring forward specific proposals aligned with the IGP in future proceedings, such as rate cases. Further, the IGP is not a comprehensive capital plan; rather, it is an important component of Versant's broader capital planning process, as described above.

VERSANT'S IGP APPROACH

FORECASTING

The MPUC Order established the foundational requirements for the IGP forecasting process. These requirements were shaped through a multi-stakeholder engagement process to ensure alignment across utilities and consistency with Maine's policy objectives. While the Order mandated the use of ISO New England's 2024 Forecast Report of Capacity, Energy, Loads, and Transmission (CELT Report), it also gave utilities flexibility to enhance their technical analysis through additional forecasting efforts. Versant leveraged this flexibility to develop a comprehensive approach that combines both "top-down" and "bottom-up" forecasting methodologies. This approach promotes climate alignment by incorporating state clean energy and electrification goals, and it advances grid modernization by modeling different DER penetration growth scenarios.

USE OF CELT REPORT FOR TOP-DOWN FORECASTING

As required by the MPUC Order, Versant utilized the 2024 CELT Report, covering years 2024–2033, as the primary source for its top-down forecasts. Versant incorporated two CELT-based scenarios:

- **Baseline Forecast:** Based on the CELT 50/50 weather year scenario.
- **High DER and Electrification Forecast:** Based on the CELT 90/10 weather year scenario.

Both scenarios include assumptions regarding distributed generation (DG), transportation electrification, and heating electrification. The CELT forecasts align with Maine's decarbonization and beneficial electrification goals and include inputs from state energy planning documents, such as the State's *Maine Won't Wait* climate action plan.

SYSTEM SNAPSHOTS

To capture variations in system conditions, Versant analyzed each forecast across six distinct "snapshots" as directed in the Order. These include three peak load cases (Summer Daytime, Summer Evening, and Winter Evening) and three minimum load cases (Daytime Minimum, Evening Minimum, and Spring Minimum). These snapshots provide a structured framework for evaluating system performance under different seasonal and temporal conditions.

LIMITATIONS OF CELT-BASED FORECASTS

While CELT data offer a robust regional perspective, they present inherent limitations for distribution-level planning:

- **Weather-Only Adjustments:** The CELT 50/50 and 90/10 scenarios account for weather variability but do not factor in changes in adoption rates for electric vehicles (EVs), heat pumps, or other electrification measures.
- **Regional Coincident Peaks:** CELT forecasts represent regional coincident peaks, whereas distribution planning relies on localized non-coincident peaks at substations and circuits.[3] This mismatch can lead to underestimation of circuit-level peaks and overestimation of minimum loads.

[3] Coincident peak demand refers to the maximum demand for electricity that occurs at the same time across a defined electric power system. Non-coincident peaks or portions of the defined system may occur at different times. For example, for a substation that serves multiple distribution feeders, the coincident peak demand on the substation transformer may be different than the sum of the non-coincident peak demands on the distribution feeders.

- **Local Non-Coincident Peaks:** The timing of peak and minimum loads may vary significantly across circuits compared to the regional system, further complicating accurate distribution planning. Non-coincident peak load typically corresponds to lowest DER output, and non-coincident minimum load typically corresponds to highest DER output.

VERSANT'S BOTTOM-UP FORECAST

To address these limitations, Versant developed an additional bottom-up forecast to reflect localized impacts of electrification and DERs. This approach incorporates:

- **System Measurements:** Substation and circuit-level load data to capture non-coincident peaks;
- **Policy Targets:** Maine's goals for heating and transportation electrification, DER adoption, and energy efficiency (EE), which align with assumptions in the CELT Report;
- **ISO-NE Forecasts:** Integration of regional trends with local conditions; and
- **Comprehensive Scenario Development:** 126 scenarios were modeled to identify boundary cases and stress-test system performance under varying conditions.

While resource-intensive, the bottom-up approach enables Versant to create comprehensive forecasts that include boundary cases for modeling and analysis. Section 4 provides more details on Versant's forecasting methodology.

MODELING & GRID NEEDS IDENTIFICATION

After selecting its forecasting approach and validating the required data inputs, such as system topology, connectivity, equipment ratings, and DER outputs, Versant developed detailed power-flow models of its distribution system. Versant then applied Peak Load and Minimum Load forecast data to these models, creating a testing envelope that allowed the Company to identify grid needs under the most challenging conditions. These models incorporated forecast scenarios derived from the CELT Report (Baseline and High Adoption), the Company's bottom-up forecast, and six seasonal load snapshots required by the MPUC.

Using this testing envelope, Versant conducted a comprehensive grid-needs analysis to stress-test the system. Stress-testing applied scenarios most likely to strain the grid and identified locations where electrification growth or increased DER penetration could cause planning criteria violations. Additional load from beneficial electrification and higher DER output can introduce thermal overloads on distribution infrastructure and voltage levels that exceed service quality standards, such as those defined in MPUC Chapter 320 rules and ANSI C84.1 criteria. These violations risk equipment damage, service degradation, and reliability issues.

Stress testing under stressed-case assumptions is an industry-accepted best practice that ensures reliability under extreme conditions and provides insight into when and where violations may occur over the 10-year IGP horizon. This analysis allows visibility into the time, location, and severity of when electrification load and DER growth triggered violations (Figure ES-1).

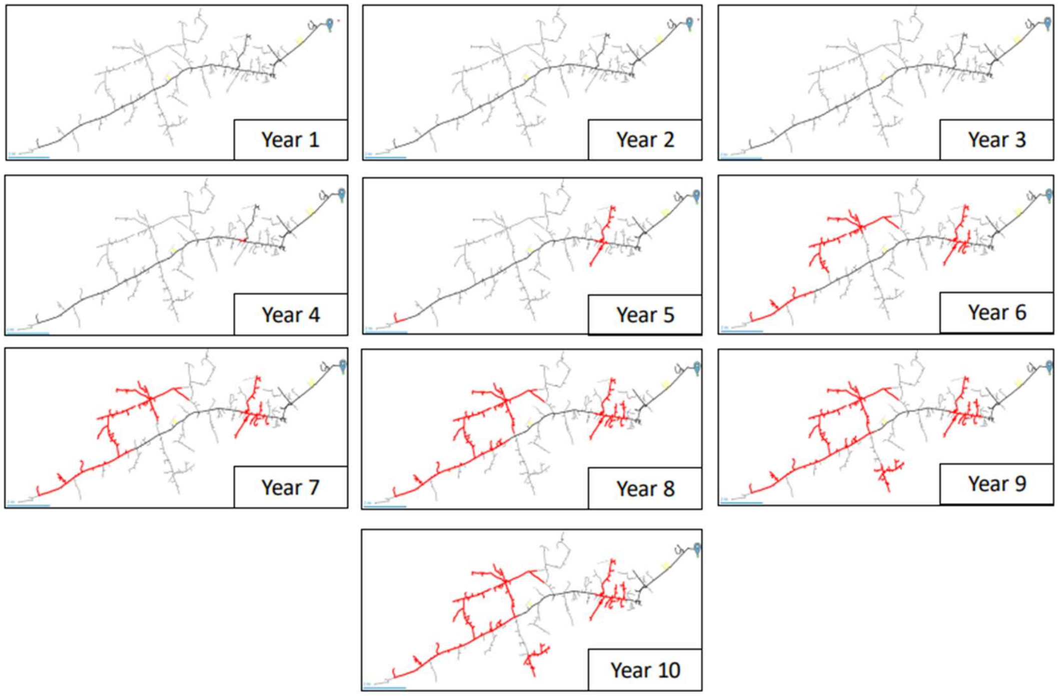

Figure ES-1. Electrification load and DER growth can increase violations on a distribution feeder over time.

SOLUTIONS IDENTIFICATION & EVALUATION

Versant's analysis identified nearly 1,000 potential system violations over the 10-year planning horizon. To address these, the Company developed a "solutions toolbox" to evaluate both traditional and non-traditional options and applied the MPUC-required scorecard methodology, grouping results into relative bands (high, medium, low). This approach enabled Versant to effectively evaluate results while avoiding false precision sometimes associated with numerically weighted scores, especially for long-term forecast-based modeling.

Recognizing affordability and timing (i.e., ensuring grid solutions generally arrive as close as possible to the emergence of the corresponding grid need) as key directives, Versant screened violations based on consequence, severity and timing. This process allowed the Company to focus on approximately 100 targeted system needs: (1) those impacting more customers; (2) those occurring in the near- to mid-term; and (3) those significantly exceeding planning criteria.

Versant created individualized scorecards to compare potential solution options for each targeted load-driven grid need. The remaining violations will be monitored and addressed in future IGP iterations or through ongoing planning and operational upgrades to maintain safety, reliability, and service quality.

Versant developed its IGP to align with the current (at the time of the MPUC Order) regulatory and statutory construct in Maine. Under such a framework, utilities may seek cost recovery for load-driven system upgrades. Generation-driven upgrades are required to be funded by the cost-causer, rather than by other ratepayers.

In recognition of the significant policy importance of renewable integration in accomplishing Maine's climate and energy goals, Versant developed illustrative scorecards for violations driven by DER growth.

IGP RESULTS

THE IGP FORECAST ADDS SIGNIFICANT BENEFICIAL ELECTRIFICATION LOAD AND DER OUTPUT TO VERSANT'S SYSTEM OVER THE NEXT 10 YEARS.

The 2024 CELT Report includes a significant amount of new load from electric vehicle charging and heat pumps. The CELT Report forecast also anticipates additional growth of solar PV on Maine's distribution systems. Several stakeholders have noted during the utility-led portion of the IGP process that future forecasts (e.g., the 2025 CELT Report) may differ markedly from the 2024 CELT Report due to rapid changes in federal policy and/or consumer behavior. Versant will closely monitor such trends, and future iterations of the IGP will be built on the best available data at the time of their inception.

Beneficial electrification loads and DERs tend to drive local impacts, and Versant addressed this with a bottom-up forecasting approach to complement the CELT Report's top-down approach. Throughout the IGP Report, the term "IGP forecast" refers to the "top-down/bottom-up" approach that Versant used to evaluate the impacts of electrification and DERs on the transmission and local distribution system.

MOST OF VERSANT'S GRID CAN ACCOMMODATE THE IGP FORECAST WITHOUT EXTENSIVE UPGRADES.

Versant's analysis shows that most of our system can accommodate these projected increases without the need for extensive upgrades over the current IGP planning horizon (10 years). However, some enhancements will be necessary in certain parts of the system. The timing and severity of future violations will also be influenced by how closely "facts on the ground" reflect the forecasts used to build the first IGP, and some identified investments may be able to be deferred if underlying causes fail to materialize.

SOME PORTIONS OF THE DISTRIBUTION AND TRANSMISSION SYSTEMS WILL REQUIRE UPGRADES.

Distribution needs

Versant prioritized the most critical grid needs, addressing them early in the IGP planning horizon, with later needs to be reassessed during the next iteration. In the Maine Public District (MPD), upgrades will primarily be driven by distributed solar impacts on the distribution system. At the same time, the Bangor Hydro District (BHD) will face increasing electrification loads, creating grid needs on the local distribution system and a few on the transmission system. Recognizing that conditions will continue to evolve due to factors such as federal policy and customer behavior, Versant designed the IGP as an iterative process to adapt to these changes.

Transmission needs

Overall, approximately 10% to 30% of the MPD and BHD transmission systems exhibited potential transmission planning criteria violations under the peak load and minimum load scenarios by 2033.[4]

Closer analysis showed that potential violations in MPD could most likely be resolved with transformer settings adjustments and operational system reconfiguration during high stress periods. These operational actions would improve the voltage profile across the MPD and reduce the need for capital upgrades.

For the BHD, the beneficial electrification load growth and increased output from DERs contribute to voltage regulation challenges as load and DER fluctuate. As with MPD, operational solutions may be able to address violations initially, but capital

[4] Minimum load scenarios also assume maximum DER output.

upgrades may be needed to increase system capacity and manage voltage toward the end of the IGP forecast horizon. These solutions are discussed in Section 6.8 of the report.

VERSANT HAS IDENTIFIED APPROXIMATELY 100 'NO REGRETS' SOLUTIONS THAT ADDRESS TARGETED DISTRIBUTION SYSTEM NEEDS.

Versant has identified approximately 100 solutions that address targeted grid needs. Solutions range from the relatively less costly and complex (e.g., replacement or installation of breakers, reclosers, and regulators) to the relatively more complicated and expensive (e.g., upgrade or installation of substation or step-down transformers).

Many of these needs and corresponding solutions would likely have surfaced during routine system planning in the coming years, and they are optimized to support other capital planning objectives, such as reliability and resilience.

Targeted distribution solutions would cost approximately $125 million to $170 million to fully implement over 10 years.[5] This range reflects a current estimate, and several factors could influence the ultimate actual costs of implementing IGP-identified solutions including, but not limited to, the exact scope, location and timing of projects; future equipment costs; and supply chain factors.

Roughly two-thirds of these costs address grid needs in the BHD, with the remaining one-third in the MPD. By providing a longer-term view, the IGP enables early visibility into these investments, helping Versant plan strategically to meet state energy goals most cost-effectively.

TRANSMISSION SOLUTIONS WOULD COST APPROXIMATELY $150 MILLION TO $200 MILLION OVER 10 YEARS.

These transmission solution costs are to address the needs primarily on the BHD local transmission system. The biggest driver of costs was the mitigation of voltage violations on the transmission system. Almost 25% of BHD buses had violations occur during the analysis, both low voltages during peak loads, and high voltages during low load and high DER penetration. Thirty-six transmission lines and transformers were predicted to be overloaded within the next 10 years.

Six solution packages, including both traditional and non-traditional projects, were considered to mitigate all identified transmission needs. The preferred solution includes the addition of GETs, the addition of equipment to support some transmission reconfigurations, the reconductoring of 70 miles of transmission lines, and the replacement of seven transformers.

VERSANT WILL MONITOR GRID NEEDS THAT COULD EMERGE OVER THE PLANNING HORIZON AS ELECTRIFICATION LOAD AND DER PENETRATION INCREASE.

Versant's analysis indicates that additional grid needs could emerge within the next 10 years as electrification loads increase and future DERs connect to the system. Versant plans to closely monitor these developments and revisit medium- and longer-term requirements in the next IGP iteration. Through the IGP, Versant has gained visibility into numerous potential future needs, enabling tracking of evolving system conditions and trends. These insights position Versant to determine when delaying or deferring solutions may be more prudent so they arrive "just in time," and to identify opportunities where proactive measures can efficiently address multiple grid challenges simultaneously, such as capacity needs, reliability improvements, and/or asset management requirements to provide the maximum value to customers.

[5] Planning level cost estimates expressed in 2025 real dollars.

INSIGHTS

IN MANY CASES, UPGRADES VERSANT MAKES TO ADDRESS ELECTRIFICATION LOAD WILL ALSO ACCOMMODATE DER GROWTH.

Upgrades identified by Versant to meet growing electrification load will, in many cases, also support DER expansion, advancing state policy objectives. Where DER growth creates additional grid needs, targeted upgrades will be required. Versant's IGP was developed under the statutory and regulatory framework established by the MPUC's July 2024 Order, including current interconnection requirements under Chapter 324 and the current generation project cost allocation principles.

While the Company did not produce individualized scorecards for DER-driven needs—individualized DER scorecards were not feasible due to factors including variability in project costs and impacts and misalignment with Maine's current regulatory framework—it created an illustrative set of scorecards projecting likely grid requirements over the next decade. These tools aim to help regulators, stakeholders, and the public evaluate costs and benefits of potential solutions. Future iterations of the IGP will adapt to any changes in statutory and regulatory frameworks, such as cost-allocation adjustments or flexible interconnection practices, as applicable.

THE IGP IDENTIFIES 'LEAST COST, BEST FIT' SOLUTIONS.

Versant's IGP approach was designed to identify least cost, best fit solutions that address evolving grid needs while supporting Maine's ambitious decarbonization and electrification goals. In its first iteration, the IGP prioritized solutions that maintain or improve reliability and resilience, ensuring technical feasibility alongside affordability for customers.

Versant's analysis revealed that the most significant drivers of grid needs were aggressive forecasts for beneficial electrification and DER growth, assumptions that marked a departure from pre-IGP planning. Consequently, the resulting challenges required solutions that could cost-effectively increase system capacity and maintain voltage over a wide range of system conditions.

To meet these needs, Versant applied a scoring framework focused on cost and technical efficacy, aligned with the IGP's foundational principles. As a result, the model selected traditional utility investments as they best addressed the identified capacity constraints over the 10-year planning horizon and aligned with the IGP's mandate for affordability and reliability. Importantly, these solutions not only resolve electrification and DER-driven violations but also deliver ancillary benefits for reliability and asset management, reinforcing the IGP's role in guiding strategic, least-cost investments for Maine's energy future.

VERSANT SEES SIGNIFICANT FUTURE POTENTIAL FOR NON-TRADITIONAL IGP SOLUTIONS.

Versant anticipates that non-traditional grid solutions will play a critical role in addressing Maine's evolving energy needs. When viewed through the lens of Versant's integrated capital planning approach, these solutions offer potential to deliver cost-effective, "no regrets" investments that meet multiple goals simultaneously.

To realize this potential, Versant remains committed to rigorous evaluation of non-traditional solutions to grid needs and looks forward to working with relevant partners, including the Office of the Public Advocate (OPA), EMT, and the Department of Energy Resources (DOER, formerly the Governor's Energy Office). With intentional collaboration, Maine can more cost-effectively address the system needs associated with the energy transition.

EVOLVING TRENDS MAY INFLUENCE THE IGP.

Slower growth for electrification and DERs

As noted by some stakeholders during the IGP process, lower adoption of electric vehicle (EV) charging infrastructure, heat pumps, and/or DER interconnections could defer the need for system upgrades. The most recent CELT Report has lowered its forecast for electrification and DER additions, reflecting slower adoption. Additionally, prevailing energy policies and incentive structures may further temper growth, reducing demand increases that would otherwise drive grid upgrades.

Large loads

Large loads, such as data centers, could fundamentally reshape the electrical system in the future. Other states have already experienced dramatic increases in these types of loads, forcing significant changes to long-term system planning. At present, Versant anticipates that most of these impacts will occur at the transmission level. While Versant does have some “latent” system capacity that could accommodate future large loads, significant uncertainties remain, such as how these loads will be supplied and what rate structures will apply. Higher electricity prices in the Northeast may impede the siting of large loads; however, the region’s strong renewable energy resource potential could alter that dynamic over time.

ENGAGEMENT WITH STAKEHOLDERS, CUSTOMERS AND COMMUNITIES IS CRUCIAL.

Throughout the Integrated Grid Planning IGP process, Versant prioritized gathering meaningful feedback from a wide range of stakeholders, especially customers themselves. This input shaped the Company’s grid plan in significant ways, reinforcing the overlapping needs that today’s electric grid must satisfy and acknowledging the tension that can exist among those priorities. To maximize transparency and collaboration, Versant undertook a two-track approach to public engagement, which ensured both technical rigor and broad community involvement.

The first track focused on technical engagement through five workshops or “Milestone Meetings.” Three of these were required by the MPUC Order, while Versant added two additional sessions to deepen stakeholder input. The first supplemental meeting occurred before Milestone One to review the Company’s proposed forecasting approach, gather feedback on data and assumptions, and explain the decision to pursue a bottom-up forecast alongside the top-down CELT Report forecast mandated by the Order. The second supplemental meeting, held before the final Milestone, invited feedback on potential solutions to be evaluated and provided an opportunity to discuss Versant’s approach to Environment, Equity, and Environmental Justice (EEEJ) considerations. These sessions benefited from the active participation of organizations such as the OPA, EMT, and the DOER, as well as numerous other stakeholders.

Complementing these technical workshops, Versant launched a series of Community Meetings across its service territory. With a goal of “meeting customers where they are,” these meetings offered updates on grid and climate planning, education about local grid conditions or plans, and facilitated an open forum for discussion on topics ranging from billing to renewable energy to assistance programs. Versant ensured knowledgeable personnel were available to address a wide range of concerns, and the Company used voluntary surveys to capture customer sentiment, analyze trends, and incorporate feedback into the IGP. The success of these meetings has reinforced Versant’s commitment to ongoing regular in-person engagement with our customers, particularly around consequential projects such as the IGP.

Finally, Versant supplemented these group sessions with targeted one-on-one meetings to ensure that a broad array of perspectives was heard. These included conversations with, among others, members of the Wabanaki Nations, EMT, environmental NGOs, the DOER and its partners at Pacific Northwest National Laboratory (PNNL), and the OPA. Versant’s policy was simple: meet with any entity expressing interest in the IGP and proactively reach out to broaden participation. This comprehensive engagement strategy reflects Versant's commitment to inclusivity and collaboration, ensuring that the grid plan is informed by diverse perspectives and grounded in the priorities of those it serves.

NEXT STEPS

As this first IGP nears completion, Versant looks forward to the next steps it anticipates will help the Company and the State continue to make progress toward the goals of facilitating the rapid energy transitions while maintaining high-quality service and affordability, enhancing data quality and analysis, and facilitating innovative solutions and customer flexibility.

METRICS & LESSONS LEARNED

As detailed in Section 9 of the report, Versant is proposing a series of metrics that it believes will help the Company, regulators, and stakeholders monitor the efficacy of the IGP in meeting its stated goals, understand trends as they develop over time, and evaluate the EEEJ impacts of the IGP and related investments, especially on disadvantaged communities.

In addition to these metrics, Versant offers a discussion of "lessons learned" from this first iteration of the IGP; designed to provide opportunities to continue refining and improving the process in the future. Additionally, the Company welcomes feedback from the public and stakeholders, as well as from the Commission, to inform the next IGP.

THE IGP'S PLACE IN THE REGULATORY FRAMEWORK

Versant views the IGP as a powerful new tool for utilities, regulators and stakeholders to better understand the long-term challenges our grid may face as a result of the rapid electrification and growth of renewable energy resources required to meet Maine's state policy objectives.

Versant does not expect the IGP itself to authorize the utilities to move forward with the solutions necessary to meet these challenges, absent additional regulatory review via existing processes. Versant anticipates bringing forward proposals to solve grid needs identified by the IGP (especially the targeted grid needs deemed most urgent) in future rate filings and/or other relevant proceedings (e.g., applications for Certificates of Public Convenience and Necessity [CPCN]). Versant also expects any project that meets the statutory requirements for non-wires alternative (NWA) review to undergo such review.

Just as the IGP does not authorize spending absent additional regulatory review, neither is the IGP a holistic utility capital investment strategy. The IGP is designed to answer a series of essential questions about how Maine can best and most cost-effectively meet the challenges of a future that includes rapid electrification and DER growth. As discussed above, Versant expects the answers to these questions to play a crucial role in informing the Company's overall investment strategy, while recognizing that other imperatives (e.g., asset management, reliability improvement, resilience, and climate) must also be considered.

Versant desires that the significant technical analysis that went into the IGP, as well as the amount of stakeholder input that informed the plan and the transparent fashion by which it was created, will help build consensus about the best ways to move forward, including by pursuing "no regrets" investments to the grid's most pressing needs.

INTRODUCTION

VERSANT POWER AT A GLANCE

Versant Power delivers safe, reliable, and affordable energy to homes and businesses across northern and eastern Maine. The Company is committed to modernizing the grid, supporting renewable energy, and ensuring communities have the power they need to thrive—today and into the future.

Versant provides safe, reliable electricity to homes, businesses, and communities across Maine.

COMPANY HISTORY

Versant is a regulated electric transmission and distribution (T&D) utility serving more than 165,000 customers across northern and eastern Maine. The Company's origins trace back to the merger of Bangor Hydro Electric Company and Maine Public Service Company in 2014, forming Emera Maine. In March 2020, Emera Maine was acquired by ENMAX Corporation, a Canadian energy company based in Calgary, Alberta. Following the acquisition, the utility was rebranded as Versant Power in May 2020.

SERVICE TERRITORY

The Company serves a geographically diverse and largely rural area covering approximately 10,400 square miles across northern and eastern Maine. The Company's service territory is divided into two districts: the southern BHD and northern MPD.

The BHD provides service to approximately 130,000 customers across Hancock, Piscataquis and Washington counties, along with most of Penobscot County. The MPD provides service to approximately 35,000 customers across all of Aroostook County and parts of northern Penobscot County, reaching the northernmost areas of the state.

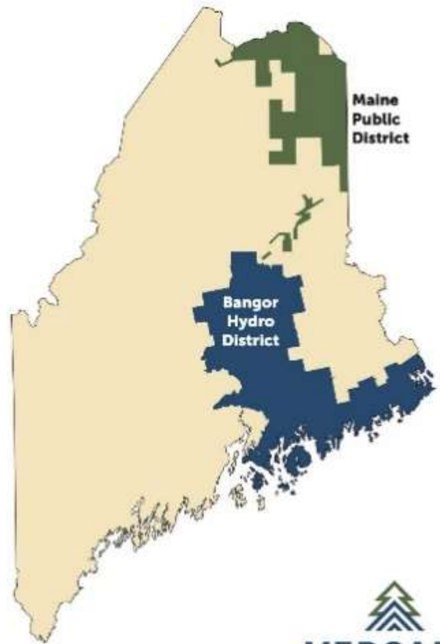

Figure I-1 – Versant Service Territory

The Versant service territory includes an array of diverse geographies, from heavily forested and sparsely populated rural areas to small coastal and island communities to Maine's third most populous city and its surroundings. Systemwide, Versant serves roughly 26 customers per line-mile, reflecting the low-density and rural nature of the service territory. This customer density level is significantly lower than that of most U.S. electric utilities.[6]

T&D SYSTEM SUMMARY

Versant operates comprehensive electric grid infrastructure across northern and eastern Maine. The system includes approximately 1,275 miles of transmission lines, approximately 6,400 miles of primary distribution lines, and 109 substations. The Company also serves six unbridged island communities and maintains ~17 miles of undersea cable.

Over the past five years, Versant has undertaken significant work to modernize and strengthen its grid to better serve its customers and meet policy and regulatory goals. Some of the Company's recent major programs include: (1) replacing bare copper wire with a more resilient covered conductor; (2) enhanced vegetation management practices focused on improved reliability against outages caused by tree contact (the Company's single biggest outage driver); and (3) the safe interconnection of hundreds of individual renewable generation projects. These system upgrades have been paired with strategic investments in modernized systems, technology, and people to improve customers' experience, enable more efficient and dynamic management of power flows, and empower customers to participate more effectively in managing their electricity use and generation and provide value to the grid.

[6] National data show that rural electric cooperatives serve an average of about 8 customers per mile of line, while investor-owned utilities average roughly 34 customers per mile. Sources: National Rural Electric Cooperative Association, *Electric Co-op 101* (Nov. 2015) at 2, https://www.electric.coop/wp-content/uploads/2016/09/Electric-Co-op-101.pdf.

Uniquely, Versant's BHD and MPD are not electrically interconnected. The MPD is the only service territory in the continental United States only interconnected to another country (Canada) and, as such, customers in the MPD receive their energy supply from Canadian sources. The MPD system operator is the NMISA, and Versant serves as Transmission Operator (TO) for the district.

In recent years, the State of Maine has seen a significant increase in renewable energy resources interconnected to the grid, especially the distribution system. Versant believes it currently hosts the single highest penetration rate of renewable energy, as compared to system peak load (largely photovoltaic [PV] resources), of any utility in the United States, presenting technical challenges that few others have yet faced. Systemwide, 367 megawatts (MW) of renewable energy capacity are currently interconnected to Versant's distribution system, which serves a peak load of 358 MW (a penetration rate of 101% of peak load). The corresponding penetration rates are 94% for the BHD (258 MW of distribution connected renewable capacity and 275 MW peak load) and 121% for the MPD (108.5 MW of distribution connected renewable capacity and 90 MW peak load).

Versant's service territory, and particularly the northern MPD, also hold significant potential for future land-based grid-scale renewable development (e.g., onshore wind resources), likely requiring significant new transmission infrastructure to interconnect with the New England grid. Some locations on Versant's system may also be well suited to host future large loads (e.g., data centers, manufacturing, etc.) or energy storage facilities, in addition to the ongoing growth of DG and beneficial electrification.

IGP CONTEXT AND DRIVERS

The development of the IGP is influenced by: (1) regulatory directives; (2) state and federal climate and energy policies; (3) evolving utility needs and capabilities; and (4) customer and stakeholder expectations. These factors shape the plan's strategic goals and the approach taken to meet Maine's long-term energy and infrastructure needs.

REGULATORY AND STATUTORY DIRECTIVES

State and federal regulations are meant to ensure the electric grid evolves to meet new demands while maintaining reliability and affordability and enabling customers to more effectively manage their usage and generation. Key regulatory factors include:

- **IGP Legislation:** Passed in 2022, An Act Regarding Utility Accountability and Grid Planning for Maine's Clean Energy Future[7] mandates the development of a 10-year IGP that enables further significant growth in renewables and beneficial electrification, empowers customer flexibility, and provides additional data transparency, all while maintaining focus on affordability and improving system reliability and resilience. The MPUC is charged with overseeing this process, including identifying plan priorities, soliciting initial stakeholders' input, and reviewing utility filings.

- **Federal Energy Regulatory Commission (FERC) Orders:** FERC orders, including FERC Order No. 2222 (DER aggregation mechanisms), FERC Order No. 2023 (generator interconnection reforms), and FERC Order No. 1920 (regional transmission planning and cost allocation reforms), serve as regulatory foundations for utilities to build systems capable of accommodating increasing amounts of DERs, advancing grid resilience, and fostering innovation in grid modernization efforts. Compliance with FERC Order No. 2222 requires coordination with ISO-NE's market participation framework, since ISO-NE is responsible for implementing DER aggregation in the wholesale market. Versant will align its operational technologies—such as Advanced Metering Infrastructure (AMI), and new data

[7] P.L. 2021, ch. 702.

integration protocols—with ISO-NE's compliance requirements to ensure safe, reliable interconnection of aggregated DERs. This coordination will directly shape Versant's plans for market participation, operational protocols, and stakeholder engagement as aggregation mechanisms are rolled out in Maine.

- **State Legislation on Clean Energy Transition:** The State of Maine has committed to aggressive climate and energy goals[8] and put forward strategies to achieve them, including the "Pathway to 2040" initiative, which outlines the State's climate resilience strategy and aims for a decarbonized, energy-efficient grid.[9] The ability to accomplish Maine's statutory climate and energy goals is a foundational objective of Versant's IGP efforts.

VERSANT'S DRIVERS

In addition to relevant regulatory requirements, Versant's key drivers for developing the IGP include:

- **Safety, Reliability, and Resilience:** Versant's core responsibility is the delivery of safe and reliable service to its customers at reasonable rates. The Company recognizes that the ways in which customers (small and large) use electricity are shifting rapidly. These transitions require enhanced reliability to meet evolving customer needs and expectations. Simultaneously, severe storms and current and anticipated impacts of climate change require that Versant make investments and implement practices that improve the resilience of the grid.
- **Cost-Effective Solutions:** The utility must balance the implementation of necessary grid upgrades with cost-effectiveness, ensuring that investments are aligned with Versant's long-term planning objectives and regulatory commitments while recognizing that investments cannot be made in a manner that unduly burdens ratepayers. Versant continues to actively evaluate emerging technologies, including non-traditional utility solutions, NWAs, demand-side management, and EE programs, and to seek external funding opportunities where available to offset ratepayer costs. This approach provides an opportunity to reduce or defer future infrastructure investments while still effectively meeting grid needs.
- **Grid Modernization:** As the Company works to modernize its infrastructure, it is investing in technologies such as AMI and ADMS, with potential future investment in a DERMS as policy direction and system needs evolve. These investments enhance the grid's safety, reliability, resilience and compliance, supporting visibility, control and flexibility needed to manage distributed resources and evolving customer demands.
- **Increased Demand and Electrification:** The rising demand for electrification, driven by policy incentives and consumer preferences, presents both opportunities and challenges for the grid. Versant must ensure the future grid can accommodate the increased load anticipated from electric vehicles (EVs) and residential electrification as well as the continued safe and reliable integration of new renewable resources.

EMERGING REQUIREMENTS FOR MODERN GRID PLANNING

In addition to the above considerations, stakeholders, regulators, policymakers, customers and utilities are increasingly focused on ensuring that emerging priorities actively shape and guide utility planning. These factors include:

- **Equity:** The grid planning process should maintain a strong focus on affordability and seek equitable outcomes, especially those that provide meaningful benefits and mitigate harm to historically disadvantaged communities.

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[8] *See* Me. Climate Council, *Maine Won't Wait: Maine's Climate Action Plan – 2024 Update* (Nov. 2024), https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/2024-11/MWW_2024_Book_112124.pdf (MWW).

[9] Me. Dep't of Energy Res., *Maine Energy Plan*, https://www.maine.gov/energy/studies-reports-working-groups/current-studies-working-groups/energyplan2040 (last visited Jan. 9, 2026).

- **Environmental Justice:** There is growing demand for grid planning that incorporates environmental justice principles, ensuring that all communities, especially underserved and marginalized groups, benefit from clean energy transitions without bearing disproportionate costs or risks.
- **Public and Community Engagement:** Public input helps guide the IGP's development, ensuring that the plan incorporates feedback and aligns as closely as possible with local needs as well as with broader state and regional goals and utility imperatives.

VERSANT'S IGP DEVELOPMENT APPROACH

Throughout the IGP development process, Versant undertook a program to actively engage customers, stakeholders and the public through public meetings, workshops, and detailed data sharing to shape a grid plan that is responsive to both regulatory expectations and community needs. The scope of this program was unprecedented in the Company's history. Versant worked to ensure this engagement enabled meaningful dialogue, allowing the utility to present information, data and plans, and for the public to offer input and feedback in multiple forums.

Versant's approach focuses on delivering an IGP that is both collaborative and transparent.

The IGP is designed to be a "living document," adaptable to future developments, new technological innovations, and policy changes, with scheduled updates every five years. Insights gained through this process will help refine and improve future iterations of the IGP.

Versant's approach to developing the initial IGP was to focus on cost-effective solutions capable of safely, reliably, and efficiently meeting the needs of Maine's clean energy future. This plan is fully aligned with the State's climate, clean energy, and resilience goals and offers a roadmap for integrating future technologies, enhancing grid flexibility, and supporting the evolution of the energy landscape.

TIMELINE OF REGULATORY AND PLANNING MILESTONES

The development of the IGP is guided by key regulatory directives, legislative actions, and utility-specific planning efforts. Critical milestones that have shaped the progression of the IGP, from its regulatory foundations to Versant's planning and implementation efforts, are outlined in Table I0-1.

TABLE I0-1 – CRITICAL MILESTONES		
Date	Milestone/Event	Description
Past		
May 2022	Approval of P.L. 2021, c. 702	Gov. Janet Mills approves Legislation requiring the development of a 10-year plan to improve system reliability and meet state policy goals.
November 2022	MPUC initiates grid plan proceeding	MPUC opened Docket No. 2022-00322 to identify grid plan priorities and engage stakeholders through a series of MPUC-led workshops and stakeholder meetings.
November 2023	Stakeholder feedback on the IGP approach	Versant participates in MPUC-led Stakeholder Engagement Meetings throughout the IGP development process. MPUC solicits feedback on the draft IGP from stakeholders, refining the plan based on public comments and technical reviews.

TABLE I0-1 – CRITICAL MILESTONES		
Date	Milestone/Event	Description
July 2024	MPUC issues order on grid plan priorities	MPUC issues an order specifying the content and priorities required in utility grid plans, focusing on reliability, data quality, and flexibility.
Present		
July 2024 – January 2026	IGP preparation and review	Versant prepares the IGP, incorporating feedback solicited and received throughout the process, and finalizes the grid plan for submission to MPUC.
Future		
January 2026 – ~March 2026	Public comment and MPUC review of submitted IGP	Stakeholders and members of the public may offer comment on Versant's IGP for a period of no less than 60 days. Upon completion of this comment period, the MPUC may accept, reject, or order revisions to the IGP.
2026 – 2036	Implementation of IGP initiatives aligned with Versant's overall investment strategy	Governed by existing regulatory processes, Versant begins implementing IGP initiatives. Versant will track and provide data regarding aspects of IGP implementation.
Ongoing / Every Five Years	Future planning cycles	The IGP will be updated every five years, beginning with the next iteration following the January 2026 filing. Subsequent updates will occur at five-year intervals incorporating new regulatory requirements, lessons learned from previous IGPs, technological advancements, and insights from ongoing monitoring.

STAKEHOLDER & PUBLIC ENGAGEMENT

This section provides a summary of the Company's approach to solicit feedback and engage stakeholders in the development of the IGP, as well as a summary of key themes in the feedback received.

APPROACH TO STAKEHOLDER & PUBLIC ENGAGEMENT

Versant's approach to public and stakeholder engagement for the Integrated Grid Planning process was two-fold: a series of in-person and virtual meetings were held across the Company's service territory to directly solicit input from customers in their communities; this was paired with five virtual stakeholder meetings (three of which were required by the MPUC Order) focused on the technical aspects of the IGP process, from inputs and assumptions to modeling, identified grid needs and potential solutions. Additionally, Versant conducted numerous one-on-one meetings with stakeholders to discuss specific aspects of the Company's IGP approach.

This multifaceted approach allowed the Company to ensure many perspectives were considered and balanced in developing the first IGP.

Community In-Person and Virtual Meetings

For the duration of the IGP process, Versant hosted a webpage to serve as the central hub for information on the IGP and Climate Vulnerability Study.[10] This webpage hosted information on stakeholder meetings, allowed stakeholders to subscribe to a grid and climate planning newsletter, and publicly posted presentations from 18 community meetings—including 17 in-person meetings and one virtual meeting. Presentations from all milestone meetings are provided in Appendix A.

The in-person meetings were held as follows:

1. Deer Isle / Stonington community meeting, **09/25/24**
2. Ellsworth community meeting, **10/01/24**
3. Bar Harbor community meeting, **10/08/24**
4. Blue Hill community meeting, **10/15/24**
5. Machias community meeting, **10/22/24**
6. Eastport community meeting, **10/23/24**
7. Cherryfield community meeting, **10/29/24**
8. Milo community meeting, **11/19/24**
9. Presque Isle community meeting, **12/10/24**
10. Fort Kent community meeting, **12/11/24**
11. Island Falls community meeting, **12/17/24**
12. Bangor/Brewer community meeting, **01/15/25**
13. Indian Island community meeting, **01/16/25**
14. Orono/Old Town community meeting, **01/22/25**
15. Lincoln/Millinocket, **01/23/25**
16. Charleston/Corinth, **01/28/25**
17. Cranberry Isles, **02/10/25**

[10] *Grid & Climate Planning*, Versant Power, https://www.versantpower.com/about/environmental/grid-climate-planning (last visited Jan. 9, 2026).

Figure I-2 illustrates the locations of the in-person community meetings on the Versant service territory map.

Figure I-2 - Locations of Versant In-Person Community Meetings

Versant connected with more than 300 residents and stakeholders throughout this process, answering dozens of questions related to basic utility operations and climate preparedness as well as the process, goals, and implications of the IGP. Versant collected notes from each meeting and solicited direct feedback from attendees via surveys. This information was tracked in a regularly updated document for reference throughout the IGP process.

Public IGP Milestone Meetings

The IGP order required stakeholder IGP milestone meetings at three specific points in the planning process. Versant held two additional milestone meetings to provide additional information on the process and solicit stakeholder feedback.

- **Milestone 0.5:** Forecasting and Scenario Development, 11/14/2025
- **Milestone 1.0:** Inputs to Forecast Models, 2/28/2025
- **Milestone 2.0:** Identifying Grid Needs, 7/10/2025
- **Milestone 2.5:** Potential Grid Solutions and Equity Assessments, 8/19/2025
- **Milestone 3:** Identifying Grid Solutions, 11/6/2025

The timeline of the Versant milestone meetings, including the required meetings and the additional meetings added by Versant, are highlighted in Figure I-3.

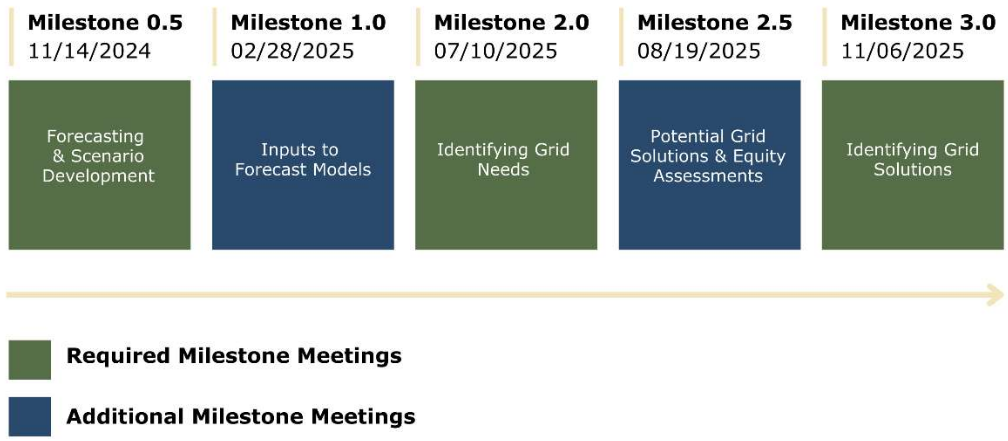

Figure I-3 - Timeline of Versant Required and Additional IGP Milestone Meetings

Additional Stakeholder Meetings

Throughout the IGP process, Versant remained open to meetings with any stakeholder upon request. For example, Versant held the following meetings to specifically discuss aspects of the IGP process and/or results:

- Union of Concerned Scientists, A Climate to Thrive, Acadia Center, Natural Resources Council of Maine, Conservation Law Foundation, Sierra Club (the "Joint Commenters") meeting, **9/17/24**
- Efficiency Maine Trust (EMT) meeting, **12/03/24**
- Penobscot Climate Action Committee, **4/10/25**
- Maine Department of Energy Resources (DOER), **6/5/25**
- EMT and OPA meeting, **7/31/25**
- Regular meetings with Central Maine Power (CMP)

CUSTOMER SURVEYS

Versant engaged community stakeholders with two surveys that would allow input into the IGP planning process, including:

1. **The Community Survey:** This survey asked questions regarding customer and community resilience, and what efforts customers would like to see to address resilience and threats from storms and climate change.
2. **The Grid and Climate Planning Survey:** This survey asked questions regarding energy, environmental, and household issues; energy priorities; average energy cost and affordability; owned and planned energy technologies (e.g., generators, heat pumps, EVs, smart devices); and additional household burdens (such as specialized medical equipment that requires electricity).

Feedback received from Versant's surveys highlighted affordability, reliability, and environmental concerns. In some parts of Versant's service territory, the use of clean energy technologies where possible was also of interest. Survey respondents also expressed concern about increasing risks from extreme weather, such as sea-level rise, flooding, and more extreme temperatures. A few respondents reported using technologies such as generators, heat pumps, and energy-saving devices, or plan to make additional purchases in the coming years. Overall, the survey results were consistent with the priorities Versant used to evaluate solutions to grid needs.

Other Feedback Received

In addition to the community engagement listed above, Versant reviewed the original comments on the Commission order and provided a unique email address listed on the Grid and Climate Planning website for stakeholders to submit comments.

Summary of Stakeholder Feedback Received

Themes that emerged from community conversations included:

- Concerns about future reliability based on past events
  - Interest in different technologies and approaches to improve reliability (such as tree trimming, bare vs. covered vs. underground wire)
  - Fear that heating electrification may leave people exposed when electricity is not reliable
- Questions and concerns about costs of electricity
  - Rate components
  - Rate design (such as time-of-use and heat pump rates)
  - Fixed and stranded costs (public policy charge)
  - Connecting new services
  - Increasing costs
- Recognition that building a clean, reliable, and low-cost grid will be difficult
- Concerns that this process will result in an overbuilt and expensive grid
- Support for stakeholder engagement efforts and appreciation for attempts to increase transparency
  - Interest in what information will be publicly available from meetings and planning effort
- Significant confusion about the local solar industry
  - Concern about costs and impacts of solar production exceeding load
  - Questions about net energy billing and how it works
  - Fear about legitimacy of third-party solar providers and offers
- Support for local, small-scale solar energy
- Concerns about the expense of interconnection in certain areas and desire for increased capacity to enable more interconnection in those areas
- Curiosity about storage and microgrids as options for increasing local grid resilience
- Interest in the home energy storage and “bring your own device” programs (e.g., Green Mountain Power’s program in Vermont).
- Suggestions for process improvements, including:
  - Filling gaps left in the MPUC order on energy, equity, and environmental justice
  - How to measure effectiveness of the plan
  - Creating fliers for presentations
  - Presenting jointly with EMT
- Reaching out to OPA on its forecasting effort

- General concern about load growth from electrification (heat pumps and EVs) and potentially population growth.
  - Questions about how DERs, heat pumps, and EVs will be modeled within the plan

IGP ORGANIZATION

As shown in Table I-2, the IGP is structured into distinct sections that follow logical progression, beginning with Versant's vision for the evolving grid and important context regarding the Company's current system and performance, moving into details of the technical planning process, and concluding with EEEJ impacts of the grid plan and recommendations for future assessment.

TABLE I-2 – IGP STRUCTURE

SECTION	OBJECTIVE	CONTENT OVERVIEW
1. Vision for the Evolving Grid	Articulate Versant's strategic vision for a modern, resilient, and clean grid.	Discusses the long-term objectives for the grid, including decarbonization, resilience, and the integration of DERs, while supporting the State's GHG goals.
2. System Overview	Provide a snapshot of Versant's existing infrastructure and grid performance.	Reviews current T&D system capabilities, DER integration, and overall system performance.
3. Forecasting and Scenario Development	Present forecasts and planning scenarios that inform grid development.	Details the load, electrification, and DER adoption forecasts under various scenarios, including baseline and high-electrification assumptions.
4. System Modeling and Needs Identification	Identify current and future grid needs based on forecasting and modeling.	Describes the methodology used to assess the grid's needs and highlights areas that require investments or upgrades.
5. Solutions Identification and Evaluation	Evaluate and prioritize solutions to meet identified grid needs, including both traditional and non-traditional methods.	Presents potential grid solutions and evaluates their feasibility, cost-effectiveness and alignment with various goals of the IGP as defined by the MPUC July 2024 Order and included scorecard template.
6. Technology, Integration, Systems Investments, and Pilot Projects	Identify and evaluate technological advancements and investments needed to modernize the grid.	Discusses investments in advanced technologies, including ADMS and energy storage, as well as pilot projects that test new technologies.
7. Environmental, Equity, and Environmental Justice	Ensure that the IGP is aligned with Maine's environmental justice and equity goals.	Evaluates the environmental, equity, and environmental justice impacts of the grid plan and includes metrics for tracking these factors.
8. Assessment	Measure the effectiveness of the IGP and the progress towards meeting key goals.	Proposes metrics to assess the success of the IGP, ensuring it meets the objectives of reliability, resilience, and the achievement of state climate policies.

1. VISION FOR THE EVOLVING GRID

1.1 VERSANT'S MISSION

Versant's mission is to enable a grid that serves as the backbone for Maine's clean energy future, ensuring that customers have access to safe, affordable, reliable, and sustainable electricity. As the Company develops its IGP amid rapid energy transitions, it is guided by key principles established through internal stakeholder workshops. These principles align with the themes identified in the MPUC Order and guide Versant's planning priorities and investment recommendations.

> Versant is aligning its mission and vision with Maine's goals, to support a clean energy future and provide customers with safe, affordable, reliable, and sustainable electricity.

The outcomes Versant seeks to accomplish include:

- **Affordability:** Prioritizing cost-effective investments that recognize customers' ability to pay their electricity bills is a key consideration as Maine transitions to a cleaner and more efficient grid.
- **Reliability:** Ensuring the grid operates reliably, even in the face of increasing demand, rapid growth of DERs interconnected to the system, and more frequent extreme weather events. This includes maintaining and upgrading existing infrastructure while embracing innovative solutions that make the grid more flexible and adaptable.
- **Supporting Policy Objectives:** Aligning grid planning with Maine's climate and energy goals by enabling the integration of renewable energy sources and DERs, such as solar, storage, and EVs.

The approach Versant will use to achieve these outcomes includes:

- **Flexibility:** Expanding the grid's ability to manage variable demand and distributed resources through AMI and the ongoing implementation of ADMS. While a DERMS is not yet in place, Versant recognizes it as a potential tool to enhance visibility and coordination of DERs in the future.
- **Grid Modernization:** Investing in infrastructure upgrades and advanced technologies that enhance monitoring, control, and system visibility, supporting both operational needs and long-term decarbonization.
- **Resilience:** Designing and implementing solutions that strengthen the grid's ability to withstand and recover from disruptive events, ensuring safe and reliable service for all customers.

Detailed methodologies describing how these priorities are achieved through forecasting, system modeling, solution identification, and performance tracking are presented in Sections 4 through 8 of this IGP.

1.2 THE PURPOSE OF VERSANT'S MODERN GRID

Versant's modern grid is no longer a one-way delivery system for electricity; it is an advanced, dynamic network that integrates new technologies, enhances reliability, supports sustainable energy sources, and enables customer engagement. As Maine moves toward a cleaner, more resilient energy future, the grid must evolve to meet new challenges and opportunities. This section describes the roles that the modern grid plays beyond traditional power delivery, its contributions to clean energy goals, and how it adapts to shifting customer expectations and policy drivers.

Versant's modern grid is an advanced, data-driven network capable of integrating renewable energy resources, managing two-way communication between utilities and customers, and providing real-time visibility into system performance and energy use. It can accommodate growth in DERs, integrate energy storage systems, and support increased beneficial electrification, particularly EVs and heat pumps. It represents a shift from the traditional one-way delivery of power to a two-way, more interactive, flexible, and smart grid that can respond to real-time demands and changing energy resources.

To facilitate energy transitions and accomplish policy goals in a cost-effective manner for customers, Versant anticipates its investment in traditional utility solutions to increase over the next decade. At the same time, Versant is committed to evaluating non-traditional solutions in areas where they can provide benefits or meet grid needs such as temporary capacity relief.

A modern grid is essential to achieving decarbonization goals, as it enables widespread use of renewable energy sources (such as solar, wind, and hydro), integrates EVs and heat pumps, and supports energy storage to balance intermittent renewable generation. By increasing grid capacity and resilience, a modernized grid can better integrate renewable energy and reduce reliance on fossil fuel generation. NWAs can also be used to support a modernized grid, reducing the need for costly and carbon-intensive infrastructure upgrades. Other energy usage controls—specifically peak reduction via utility-controlled Demand Side Management (DSM) programs—may be necessary to avoid costly upgrades.

Customers expect more reliable and sustainable energy. Some seek greater control over their energy usage, which may be achieved through AMI, time-of-use rates, and participation in demand response programs. State policies such as Maine's Climate Action Plan and federal decarbonization initiatives have codified the pursuit of clean energy and climate resilience. In 2022, at the initiation of the IGP process, these focused primarily on emissions reduction targets and were expanded to include incentives and infrastructure funding under the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA), supporting grid modernization and renewable integration. More recent policy developments at the federal level will, no doubt, affect assumptions and inputs underpinning the next iteration of the IGP.

Table 1-1 compares traditional grid functions versus modern grid requirements and clearly outlines the differences in capabilities.

TABLE 1-1 – TRADITIONAL GRID VS. MODERN GRID	
TRADITIONAL GRID CAPABILITIES	MODERN GRID CAPABILITIES
One-way powerflow from generation to customers	Two-way power flow enabling both generation and consumption at the customer level
Limited data collection and real-time monitoring	Real-time data analytics, AMI, and sensors for grid health and demand monitoring
Centralized energy generation (fossil fuels)	High penetration of decentralized renewable energy generation (solar, wind) and energy storage solutions
Reactive grid management (manual adjustments)	Proactive, automated grid management to manage equipment loading and system voltage profiles[11]
Limited customer participation in grid management	Active customer engagement with energy usage, demand response, and integration of personal DERs (solar, EVs)
Static load management (manual reconfiguration, fixed schedules)	Dynamic load management with real-time controls, automated demand response, and load forecasting integrated with ADMS
Voltage regulation through fixed capacitor banks and manual tap settings	Advanced voltage optimization using smart inverters, sensors, and ADMS coordination for feeder-level voltage control

1.3 ADAPTING TO EVOLVING REGULATORY AND POLICY LANDSCAPES

This section outlines the Company's approach to complying with and navigating with the evolving regulatory and policy landscape.

1.3.1 SUPPORTING ISO-NE'S IMPLEMENTATION OF FERC ORDER 2222 (DER AGGREGATION MECHANISMS)

FERC Order No. 2222 requires regional transmission organizations, including ISO-NE, to enable the participation of aggregated DERs in wholesale electricity markets. While compliance responsibilities rest with ISO-NE, Versant plays a critical supporting role in ensuring that DER aggregations can safely and reliably connect to the distribution grid. Versant's responsibilities include reviewing proposed aggregations, sharing necessary data, and helping manage local grid impacts. Versant's role in supporting DER aggregation does not include acting as an aggregator or duplicating EMT's behind-the-meter (BTM) device management investments; our responsibilities remain focused on safe interconnection, grid visibility, and coordination with ISO-NE and third parties. This coordination will require new tools and closer collaboration with third parties to support a more flexible and modern grid. Some efforts include:

- Using AMI and grid monitoring tools to track real-time DER output and demand at the local level.
- Assessing DERMS capabilities required by Versant to safely operate the grid. DER awareness is critical to ensure knowledge and visibility about specific DER loads or supplies and to confirm proper data inputs exist for advanced applications such as power flow analysis, load forecasting, and enabling third-party DER aggregation.

[11] These modern grid capabilities correspond to the projects described in Section 7 (Technology, Integration, Systems Investments, and Pilot Projects), including the deployment of ADMS, expanded distribution automation, advanced metering and sensing technologies, and pilots that enable predictive analytics and demand-response–related functionality.

- Improving data integration systems to support communication between the utility, DER aggregators, and ISO-NE.
- Establishing clear screening and review criteria for DER aggregations to ensure safe interconnection and updating interconnection procedures and timelines to reflect FERC Order No. 2222 requirements.
- Evaluating and aligning planning methodologies with IGP outcomes to ensure that system planning adequately considers both long-term grid needs and the impacts of DERs.

1.3.2 GENERATOR INTERCONNECTION REFORMS (FERC ORDER 2023)

FERC Order No. 2023 was adopted to reduce backlogs for projects seeking to connect to the transmission system and to improve certainty in the interconnection process managed by transmission providers across the country. While the primary compliance obligations rest with ISO-NE and transmission providers, these reforms create important context for Maine's grid transition. For Versant, the relevance lies in ensuring that distribution-level interconnection processes remain aligned with regional practices and that local planning accounts for potential upstream impacts.

It is important to note that, consistent with MPUC's jurisdictional directive, the IGP focuses on distribution grid planning. Versant's role with respect to FERC Order No. 2023 is therefore supportive and contextual, not one of direct compliance.

1.3.3 REGIONAL TRANSMISSION PLANNING AND COST ALLOCATION REFORMS (FERC ORDER 1920)

FERC Order No. 1920 introduces significant changes to how regional transmission planning and cost allocation are conducted across the country. The goal of these reforms is to ensure that long-term transmission needs are planned more proactively and transparently, while also supporting grid reliability, decarbonization goals, and fair cost distribution among beneficiaries.

Versant's role under Order No. 1920 will include participating in a more coordinated and forward-looking regional planning process, one that looks at transmission needs at least 10 years into the future. The Company anticipates working more closely with ISO-NE and other regional entities to evaluate system scenarios that reflect changing technologies, public policy mandates, and evolving customer demands. Additionally, the Company expects to support the development of cost allocation frameworks that ensure investments are made efficiently and that costs are shared fairly based on the benefits delivered. As the regional planning process evolves, Versant is committed to engaging constructively and ensuring that Maine's transmission needs are represented and aligned with broader system goals.

1.4 THE ROLE OF THE IGP

Versant's IGP serves as a comprehensive strategic and analytical framework that updates and enhances the Company's approach to grid planning. The IGP shifts Versant toward a more integrated, portfolio-based process that aligns infrastructure, operations, and capital investments with state and local policy goals. By establishing a structured method for assessing system needs, evaluating traditional and non-traditional solutions, and prioritizing investments, the IGP provides clearer visibility into long-term requirements driven by electrification, DER adoption, resilience needs, and aging infrastructure. This approach strengthens Versant's ability to plan proactively, compare investment options consistently, and direct resources toward solutions that support reliability, affordability, and the State's climate objectives.

The IGP builds upon Versant's existing long-term planning and asset management processes, expanding them to account for climate resilience, technological advancements, and decarbonization objectives. It integrates with ongoing operational plans by incorporating insights from various planning frameworks, including distribution planning, load forecasting, and grid resilience assessments, while also addressing new regulatory and policy requirements.

The IGP is designed to inform a range of critical decisions, including capital investments, operational strategies, and regulatory compliance. It also helps guide decisions related to grid infrastructure upgrades, the adoption of new technologies, and customer programs (e.g., demand response). Additionally, it serves as a tool for stakeholder engagement by increasing transparency in the utility planning process and ensuring that planning outcomes and priorities are aligned with the needs of both the utility and its customers.

Community input is a critical component of the IGP development process. Through public consultations, workshops, and stakeholder meetings, the IGP has been shaped by the perspectives and concerns of local communities, environmental groups, government agencies, and customers. Stakeholder input has been integrated throughout the IGP process, including scenario development (Section 3), system needs identification (Section 4), and the evaluation of solutions and investments (Sections 5 and 6). This ensures that the plan reflects the diverse needs of the population, from affordability and reliability to equity and access to clean energy.

The IGP enables Maine's progress toward its clean energy goals by considering pathways for integrating additional renewable energy sources, energy storage, and electrification initiatives, including EVs and heat pumps. Rather than implementing these measures directly, the IGP serves as an analytical and planning framework that evaluates grid needs, informs investment priorities, and coordinates with state objectives. It incorporates climate resilience by assessing grid vulnerabilities and identifying strategies to strengthen reliability, while maintaining alignment with Maine's broader climate and decarbonization policies. The IGP aligns with the State's GHG reduction targets and serves as an enabling foundation for achieving the Pathway for Maine's clean energy future.

While these technologies (EVs, DERs, and load electrification) are crucial for meeting clean energy goals, their proliferation introduces significant technical challenges across secondary and service systems (including service conductors and transformers) and upstream components (such as fuses and voltage regulators). Specifically, the operational complexities necessitate a re-evaluation of infrastructure due to concerns over voltage deviation, current fluctuations, and the thermal capacity (ampacity) of conductors. Addressing these challenges has driven adaptive planning and updating design strategies to mitigate potential risks and ensure the resilience, safety, and efficiency of the rapidly evolving grid.

The IGP takes a coordinated approach to T&D planning by considering the interactions between both systems and ensuring that distribution planning reflects relevant transmission insights. It considers the interdependence between T&D infrastructure, as well as the evolving needs of both systems in the context of the energy transition. The IGP functions as a planning framework that enables proactive grid investments by identifying emerging challenges early, such as increasing load growth and rising DER adoption, and addressing them before they become critical issues. By using forecasting and modeling tools, as described in Section 4 – Forecasting and Scenario Development, the IGP allows Versant to make informed strategic decisions about infrastructure investments and operational improvements that may be capable of cost-effectively meeting such challenges.

1.5 ROLES OF THIRD-PARTY STAKEHOLDERS IN GRID NEEDS ASSESSMENT AND GRID PLAN

Versant recognizes the critical role of third-party stakeholders in shaping the IGP. Throughout the docket process, input from stakeholders such as consumer advocates, technology providers, and policy organizations, as well as from representatives of state government, informed both the grid needs assessment and the development of the IGP scorecard. This engagement emphasized several priorities:

- **Clarity and Specificity of Grid Needs:** Stakeholders highlighted the importance of defining grid needs with sufficient detail such as location, timing, and type of constraint, so that utilities and potential solution providers can evaluate whether traditional and/or NWAs are appropriate. Versant incorporated this feedback into its approach to system constraint identification and scoring.
- **Time-Series Planning and Data Transparency:** Multiple parties stressed that time-series analysis enables better alignment between renewable generation, electrification loads, and system needs. Versant responded by including time-series methodologies in its approaches for forecasting (Section 3.5.4.3) and needs assessment (Section 4.3). While this IGP incorporates foundational time-series capabilities, fully embedding these methods into project-level scoping and justification will require additional development and tailored application in future planning processes, given current data, cost-benefit, and resource constraints.
- **Non-Traditional and Non-Utility Solutions:** Stakeholders emphasized that solutions should not be limited to utility capital investments, but should also include advanced technologies, rate design, demand-side programs, and third-party provided resources. Versant reflected this feedback in the design of its scorecard criteria, which explicitly evaluates a range of potential solutions beyond traditional utility investments. Because this IGP presents a high-level screening framework, the alternatives are described broadly; detailed evaluation of specific non-utility or non-traditional options will occur through future project-level justification and scoping processes, where tailored approaches can be applied.

Versant's use of the scorecard framework ensures that stakeholder priorities, such as innovation, NWAs, and equitable solutions, are explicitly considered in assessing needs and comparing alternative solutions to traditional utility solutions. Rather than simply recording stakeholder comments, Versant integrated this input directly into the IGP's analytical tools and decision-making process (see Sections 4 and 5 for how stakeholder priorities informed forecasting assumptions, needs identification, and solution evaluation).

2. SYSTEM OVERVIEW

Versant operates comprehensive electric grid infrastructure across northern and eastern Maine. The system includes approximately 1,275 miles of transmission lines and approximately 6,400 miles of primary distribution lines, and 109 substations. The Company also serves six unbridged island communities and maintains ~17 miles of undersea cable. The Versant service territory includes two districts—the BHD and MPD. Compared with MPD, the BHD serves more densely populated communities, characterized by higher loads and greater concentrations of commercial and industrial activity. The MPD serves a predominantly rural area with lower customer density and faces operational challenges due to the nature of electric infrastructure in rural settings.

In fact, Maine now has the highest solar saturation level in the continental United States, with more than 600 watts per person. As a percentage of peak load, Versant believes it currently has the highest level of solar penetration of any U.S. utility (367 MW of distribution-interconnected solar vs. 358 MW of peak load, or 101%), with the corresponding number even higher in the MPD. Such rapid changes to Maine's electric system will bring benefits but also pose challenges for the grid, including new considerations for system planning.

Using the most recently available load data at the initiation of the IGP process, Versant's system peak demand was 364 MW. The Company has the following datasets available for technical analysis:

- **Load Visibility:** Automated daily hourly data collection for most substations and feeders. Minimal amount of infrastructure with insufficient data requiring manual verification;
- **Data Acquisition:** Mix of automated and manual collection methods;
- **System Monitoring:** Supervisory Control and Data Acquisition (SCADA) and AMI coverage across distribution substations and feeders; and
- **AMI Capabilities:** Attributes including kilowatts (kW), kilovolt-amperes reactive (kVAR), kilovolt-amperes (kVA), power factor, and other related metrics.

The BHD interfaces with the regional grid operator ISO-NE, which enables access to wholesale electricity markets and regional planning support.

The MPD interfaces with neighboring utility New Brunswick Power (NB Power) resulting in additional planning considerations, operational constraints, and distinct load characteristics.

Versant's efforts to improve reliability have resulted in steady improvements in standard reliability performance metrics. Versant's 10-year SAIFI and SAIDI post exclusion performance is in Figure 2-1 and Figure 2-2 below.[12]

[12] Versant Power Exceptions and Comments to the Recommended Comments to the Recommended Decision, Docket No. 2025-00270, at 5 & 7 (Dec. 11, 2025) (containing Figures 2-1 and 2-1).

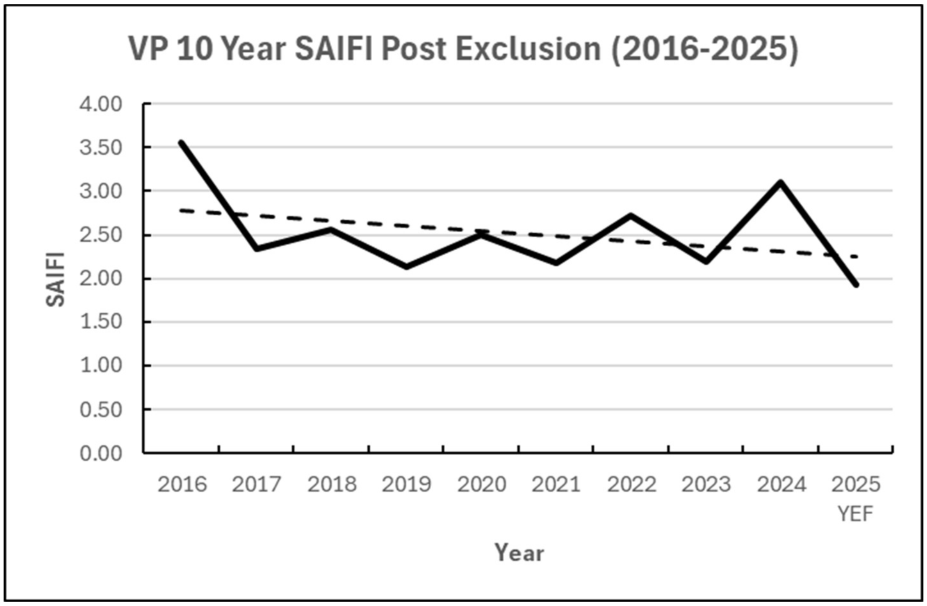

Figure 2-1 – 10-Year SAIFI Post Exclusion

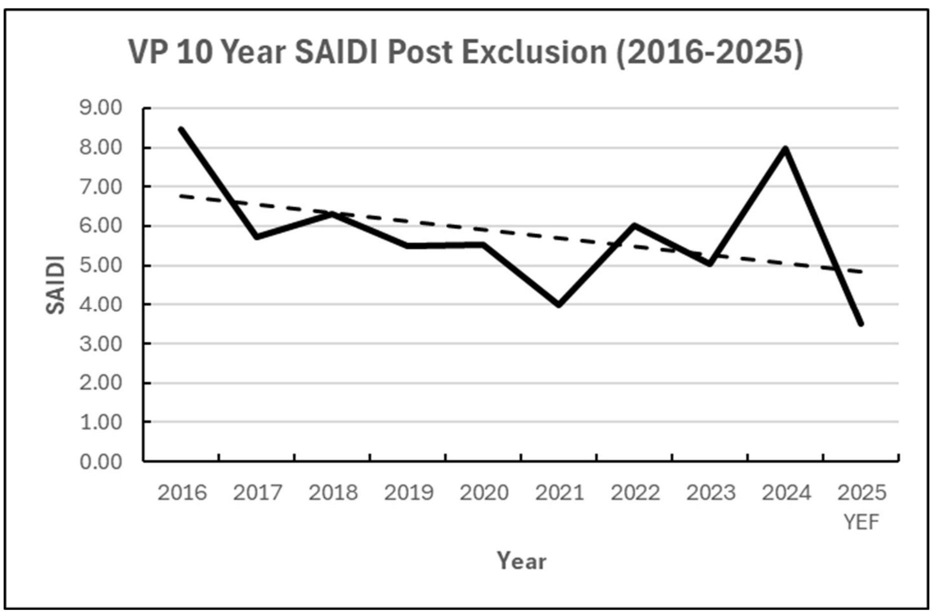

Figure 2-2 – 10-Year SAIDI Post Exclusion

Versant's reliability performance for the past five years is summarized in Table 2-1.

TABLE 2-1 – RELIABILITY PERFORMANCE INDICES[13]		
YEAR	SAIFI	SAIDI
2020	2.50	5.53
2021	2.18	4.01
2022	2.72	6.01
2023	2.19	5.05
2024[14]	3.10	7.97
2025[15]	1.93	3.52

2.1 TRANSMISSION SYSTEM OVERVIEW

Versant's transmission system is structured as a combination system (radial/mesh networked/looped) and comprises more than 2,000 miles of transmission lines ranging in voltages from 34.5 kV, 44 kV, to 69 kV, 115 kV, 138 kV, and 345 kV. A summary of Versant's transmission system is outlined in Table 2-2.

TABLE 2-2 – TRANSMISSION LINE SUMMARY	
VOLTAGE CLASS	APPROXIMATE LINE MILES
345 kV	90
138 kV	12
115 kV	262
69 kV	310
44 kV	335
34.5 kV	266
Total	**1275**

Overall transmission asset health is as follows:

[13] Versant tracks SAIFI and SAIDI among its reliability performance metrics.

[14] 2024 reliability was negatively impacted by a large number of storms.

[15] 2025 is based on Versant's year-end forecast as of November 2025.

Classification	Asset Type	Very Good	Good	Fair	Poor	Very Poor	Total
Transmission	Circuit Breaker	39	65	4	1		109
Transmission	Power Transformer	2	11	5	2	5	25
Transmission	Line Conductor	4619	11647	2802	2033	909	22010
Transmission	Line Structure	11624	8919	4637	2583	106	27869

Asset Type	Very Good	Good	Fair	Poor	Very Poor
Circuit Breaker	36%	60%	4%	1%	0%
Power Transformer	8%	44%	20%	8%	20%
Line Conductor	21%	53%	13%	9%	4%
Line Structure	42%	32%	17%	9%	0%

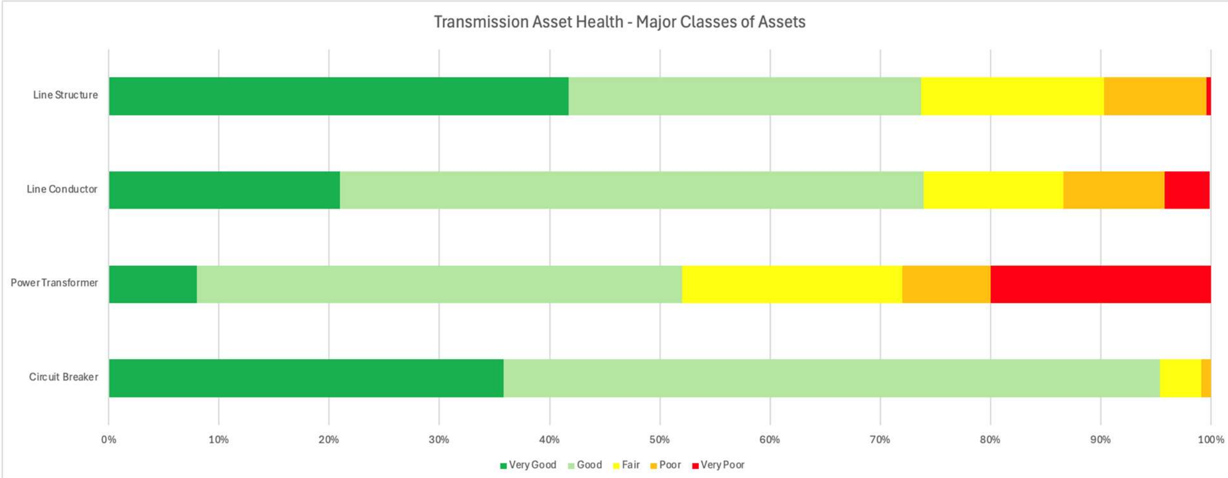

Figure 2-3 Transmission asset health summary – lines and related infrastructure.

		By Quantity					
Classification	Asset Type	Very Good	Good	Fair	Poor	Very Poor	Total
Transr	Synchronous Scrolling	4619	11647	2802	2033	909	22010
Transmission	Structure	11624	8919	4637	2583	106	27869
Transmission	Substation & Large Equipment	41	76	9	3	5	134

	By % of Total Qty				
Asset Type	Very Good	Good	Fair	Poor	Very Poor
Conductor	21%	53%	13%	9%	4%
Structure	42%	32%	17%	9%	0%
Substation & Large Equipment	31%	57%	7%	2%	4%

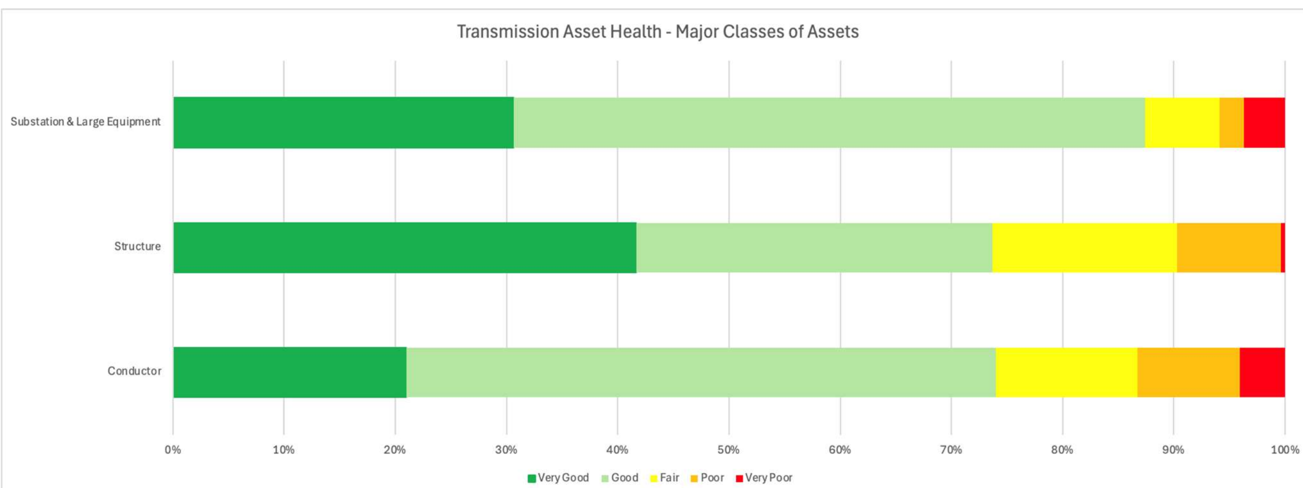

Figure 2-4 Transmission asset health summary - substations and related infrastructure.

Versant utilizes PSS®E (Power System Simulator for Engineering) by Siemens to complete transmission system assessments. Table 2-3 outlines the primary function of each Power Simulation software:

TABLE 2-3 – TRANSMISSION SYSTEM MODELING SOFTWARE SUMMARY		
SOFTWARE	DEVELOPER	PRIMARY FUNCTION
PSS®E	Siemens	Power system simulation tool used for transmission planning and analysis. It offers core functions like power flow studies, fault analysis, dynamic stability simulations, optimal power flow, and contingency analysis

2.2 DISTRIBUTION SYSTEM OVERVIEW

Versant's distribution network is predominantly designed as a radial system, with limited instances of meshed or looped configurations. The primary distribution network spans approximately 6,400 miles operating across a range of voltages, from 2.4/4.16 kV to 19.9/34.5 kV. Versant's total substation capacity is approximately 860 MVA. A summary of Versant's distribution system is outlined in Table 2-4.

TABLE 2-4 – DISTRIBUTION SYSTEM INFRASTRUCTURE SUMMARY				
VOLTAGE CLASS	DISTRIBUTION SUBSTATION CAPACITY (KVA)	DISTRIBUTION SUBSTATION TRANSFORMER CAPACITY[16] (KVA)	DISTRIBUTION OVERHEAD CONDUCTOR	DISTRIBUTION SUBSURFACE CONDUCTOR[17]
34.5 kV	20,800 kVA	20,800 kVA	311 Miles	5 Miles
13.2 kV	116,716 kVA	116,716 kVA	545 Miles	3 Miles
12.47 kV	702,814 kVA	702,814 kVA	4,959 Miles	139 Miles
< 12.47 kV	19,917 kVA	19,917 kVA	404 Miles	35 Miles

Versant has strong data visibility across its distribution system, with most substations and feeders providing accessible data. Data include elements such as MW, MVAR, amps, and voltage. Feeder-level data are available at both hourly and daily intervals, supporting detailed operational insights. Figure 2-5 - Visibility Associated with SCADA and AMI below provides a simple representation of visibility associated with SCADA and AMI. Table 2-5 and Table 2-6 summarize the extent of monitoring and control visibility across Versant's substations and feeders, which is primarily acquired through SCADA. At the substation level, Versant is capable of directly monitoring both the substation and its connected feeders at more than 85% of its substations, while about 11% record only substation data. Only two substations have no data, as they are either privately owned or under construction.

[16] Distribution substation transformer capacity is equal to distribution substation capacity.

[17] "Subsurface" refers to underground and submarine cables.

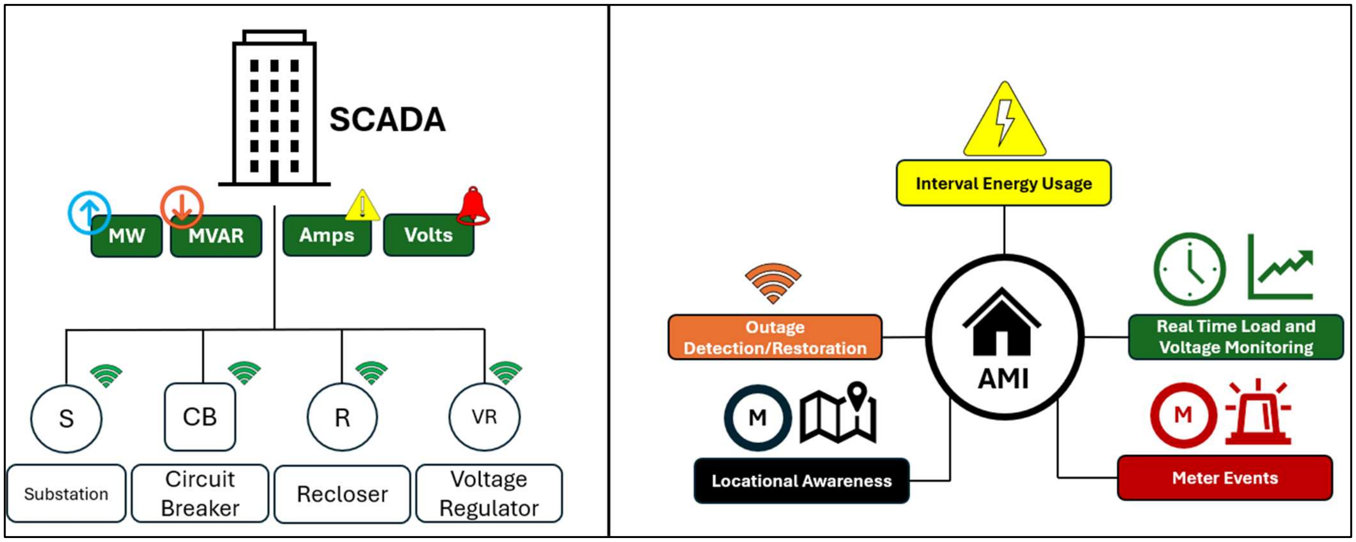

Figure 2-5 - Visibility Associated with SCADA and AMI

TABLE 2-5 – SUBSTATION DATA VISIBILITY		
VISIBILITY	SUBSTATIONS	% OF TOTAL
Substation Data & Connected Feeder Data	65	85.53%
Substation Data	9	11.84%
No Data	2	2.63%

At the feeder level, over 81% of feeders can be monitored at hourly resolution, providing detailed and timely data for operational and analytical purposes. A small number of feeders are currently recorded only at the daily level, The remaining feeders do not yet have consistent periodic records due to several factors, including being out of service, privately owned, or still under construction.

TABLE 2-6 – FEEDER DATA VISIBILITY		
VISIBILITY	FEEDERS	% OF TOTAL
Hourly Data	184	81.4%
Daily Data	2	0.9%
Out of Service, Privately Owned, Under Construction	40	17.7%

Versant launched its AMI initiative in 2022, aiming to deploy the Itron Riva AMI system across its service territory. As of September 2025, the utility has installed approximately 166,700 AMI-enabled meters. As part of the program, customers have the option to opt out. Currently, approximately 0.25% of installed AMI meters (417 meters) have been configured for opt-out, which eliminates AMI functionality and restricts available data to basic consumption information, such as monthly billing data. The AMI system enables automated collection and transmission of meter data, typically in 15-minute intervals, for billing and operational purposes. Table 2-7 summarizes the monitoring capability available from Versant's AMI meters.

TABLE 2-7 – AMI SUMMARY
Interval energy usage
Real-time load and voltage monitoring
Meter events (i.e., tampering, elevated temperatures, loss of phase)
Outage detection and restoration events
Locational awareness (i.e., electric location of meters)

Overall distribution asset health is as follows:

		By Quantity					
Classification	Asset Type	Very Good	Good	Fair	Poor	Very Poor	Total
Distribution	Conductor	19,836	64,253	47,507	28,519	9,093	169,208
Distribution	Pole	34,133	61,980	66,573	35,207	1,422	199,315
Distribution	Substation & Large Equipment	931	429	81	303	512	2,256

	By % of Total Qty				
Asset Type	Very Good	Good	Fair	Poor	Very Poor
Conductor	12%	38%	28%	17%	5%
Pole	17%	31%	33%	18%	1%
Substation & Large Equipment	41%	19%	4%	13%	23%

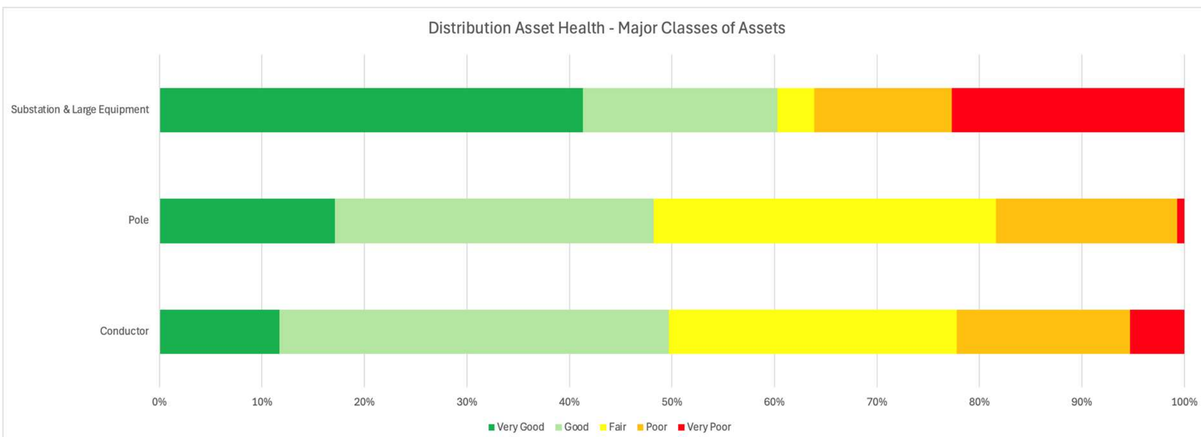

Figure 2-6. Distribution asset health summary.

Versant utilizes ***CYME Power Engineering Software*** by Eaton for distribution system analysis and planning. CYME supports detailed modeling and simulation of distribution networks including radial, looped, and meshed configurations. Key capabilities include load flow, fault analysis, voltage sag, motor starting, optimal capacitor placement, and load balancing. CYME also supports DER interconnection studies, time-series analysis, and protection coordination, with extensive equipment libraries and customizable graphical interfaces.

2.3 VERSANT SYSTEM INVESTMENTS

2.3.1 DISTRIBUTION AND TRANSMISSION SYSTEM SPENDING

Versant maintains five capital investment categories: (1) Load Growth and Development; (2) Sustaining Upgrades and Replacements; (3) System Hardening; (4) Customer Driven Additions; and (5) Strategic, Operational or Required. Tables 2-8 and 2-9 summarize the investments in each category for the past five years (2021-2025) and future five years (2026-2030). Descriptions of each investment category follow the tables below. The investments for the future five years as shown in Table 2-9 do not include investments associated with IGP-identified needs.

TABLE 2-8 – 2021-2025 ACTUAL T&D SYSTEM INVESTMENT (MILLIONS)

INVESTMENT CATEGORY	2021	2022	2023	2024	2025
Load Growth and Development	$ 2.2	$ 10.8	$ 24.7	$ 11.9	$ 15.4
Sustaining Upgrades and Replacements	$ 50.4	$ 50.6	$ 59.6	$ 57.8	$ 71.1
System Hardening	$ 10.2	$ 9.5	$ 11.9	$ 24.3	$ 16.0
Customer Driven Additions	$ 11.4	$ 13.4	$ 11.8	$ 23.2	$ 18.4
Strategic, Operational or Required	$ 4.0	$ 21.1	$ 28.6	$ 7.9	$ 12.5

TABLE 2-9 – 2026-2030 PROJECTED T&D SYSTEM INVESTMENT (MILLIONS)

INVESTMENT CATEGORY	2026	2027	2028	2029	2030
Load Growth and Development	$ 10.6	$ 10.8	$ 14.0	$ 11.2	$ 12.9
Sustaining Upgrades and Replacements	$ 75.4	$ 83.9	$ 80.1	$ 91.4	$ 87.5
System Hardening	$ 17.3	$ 22.6	$ 26.2	$ 26.1	$ 27.0
Customer Driven Additions	$ 18.1	$ 16.1	$ 16.6	$ 17.2	$ 17.9
Strategic, Operational or Required	$ 3.8	$ 5.5	$ 9.4	$ 3.9	$ 6.3

Load Growth and Development

Versant's T&D system serves a customer base that continues to grow organically. As existing customers increase their electrical demand and the Company provides service to new homes and businesses, the load on existing infrastructure grows. Versant monitors load growth to determine the need for system upgrades to maintain service within its planning criteria, with a focus on equipment loading and voltage.

Sustaining Upgrades and Replacements

Versant's grid, much of which was built 50 to 70 years ago, is continuously monitored and analyzed to determine which assets require replacement, when, and with what equipment. The primary goal of this work is to maintain service quality and prevent disruptions caused by aging infrastructure. Given these challenges, asset management has long represented a significant portion of the Company's annual capital investments. Utility assets typically operate for 30 to 50 years, so Versant regularly updates its standards to ensure replacements can meet future system needs.

System Hardening

Reliability improvements are a core component of Versant Power's capital planning process. These investments target areas of the system with historically poor performance to ensure customers experience fewer and/or shorter outages. Solutions include replacing bare copper wire with covered conductor, rebuilding vulnerable line sections, and installing devices to isolate portions of the grid during an outage. Versant takes such steps to maintain service quality and to deliver measurable improvements for affected customers.

Resilience focuses on the grid's ability to withstand and recover from severe conditions, including those driven by climate change. Maine's climate is evolving rapidly, with increasing risks from high winds, flooding, extreme temperatures, and forest fires. To address these challenges, Versant completed a Climate Change Resilience Plan and a Climate Vulnerability Study, using custom modeling to identify system components most at risk and develop adaptation strategies. Resilience investments include replacing wooden poles with stronger composite alternatives, relocating infrastructure from flood-prone areas, and measures that enhance recovery speed after disruptive events. These efforts ensure the grid remains robust and responsive in the face of future climate impacts.

Customer Driven Additions

To serve new customers, Versant must often expand its system to accommodate additional load interconnections. These customer-driven investments typically include installing new poles, service transformers, secondary conductors, and meters. For larger customers, the work may also involve extending existing lines to ensure reliable service.

Strategic, Operational or Required

These include investments that fall outside other categories (e.g., AMI) and statutory, regulatory, or contractual driven investments (e.g., Maine Department of Transportation construction and or requests from pole attachers, such as communications).

2.3.2 DISTRIBUTION AND TRANSMISSION CAPITAL PROJECTS

2.3.2.1 Planned Projects

As part of Versant's ongoing integrated capital planning approach, the Company has identified several T&D projects to be completed over the next five years. Appendix E provides a list of these planned projects along with each project's expected in-service date and primary driver.

2.3.2.2 Anticipated Changes in Historic Spending

Versant anticipates that future capital and operating expenditures may differ from historic spending patterns as the electric system evolves to meet changing policy objectives, customer needs, and technology adoption. These changes are driven by the transition toward a decarbonized grid, increasing levels of beneficial electrification, and continued growth in DER adoption.

State energy and climate goals, along with associated policies, programs and incentives, are expected to significantly influence the pace and scale of electrification and DER deployment. As adoption increases, Versant may experience changes in system usage and operational requirements that differ from historical conditions. In response, certain distribution system upgrades or enhancements may be necessary to maintain safety, reliability and power quality and to support evolving load characteristics and two-way power flows on the system.

While interconnection facilities are funded by customers or developers in accordance with applicable MPUC regulations and cost-causation principles, higher levels of DER adoption and electrified end uses may drive broader system-level needs. These needs may include increased emphasis on system planning and analysis, targeted capacity upgrades, modernization of protection and control schemes, and improved system visibility to support efficient operation of the distribution system.

In addition, changes in load growth patterns and DER deployment may shift the timing, location and type of required investments relative to historic norms. Future spending may become more geographically targeted, reflecting localized load growth, hosting capacity limitations, and evolving operational requirements rather than uniform system-wide expansion. There may also be increased consideration of grid flexibility measures and NWAs where appropriate.

Given uncertainties related to policy direction, technology adoption rates, and customer choices, the magnitude and timing of these spending changes remain uncertain. This IGP identifies key drivers that could influence future investment needs without presuming specific outcomes. Versant will continue to evaluate these drivers through its integrated grid planning process to ensure that any system investments remain prudent, cost-effective, and aligned with state policy objectives while maintaining safe and reliable electric service.

2.3.3 DISTRIBUTION AND TRANSMISSION COST RECOVERY

Versant anticipates seeking cost recovery for IGP-driven investments via existing regulatory cost recovery mechanisms (e.g., rate cases, CPCN filings, etc.). Given that Versant does not have an active petition for a rate change (or other relevant application) pending before the MPUC, it cannot yet indicate investments for which it is currently seeking recovery for specific IGP-driven investments. In future rate filings, however, Versant will indicate proposed investments that align with IGP-identified needs and solutions. Additionally, Versant expects that any proposed investments that meet the criteria for NWA review will continue to be evaluated via that established process.

2.4 VERSANT DER AND EV DEPLOYMENT OVERVIEW

This section provides a summary of current and queued DER deployments, including storage and EV infrastructure within Versant's service territory. DERs deployed in the Versant system encompass a range of technologies including solar PV, battery energy storage systems (BESS), hybrid systems (e.g., solar paired with storage/wind), and small hydro. These resources vary by size and are geographically dispersed across the service territory, reflecting both residential and commercial-scale applications. All DERs are owned, operated, or proposed by customers or third-party developers. In accordance with Maine law, Versant Power does not own generation. DER deployment as of December 2024 is summarized in Table 2-10.

TABLE 2-10 – VERSANT DER DEPLOYMENT BY TYPE

DER TYPE	PROJECTS	CAPACITY[18]	STORED ENERGY[19]
Solar PV Systems	2,363	364,410 kW	N/A
BESS	5	51 kW	100 kWh
Combination (PV, BESS, and/or Wind)	28	445 kW	401 kWh

[18] This capacity is for systems that are connected to the primary distribution system. This does not include renewable energy systems that are connected to transmission or sub-transmission systems.

[19] DERs with energy storage include a capacity rating in kWh. DER deployment across BHD and MPD is summarized in Table 2-11.

TABLE 2-11 – VERSANT DER DEPLOYMENT BY REGION			
OPERATING REGION	PROJECTS	CAPACITY	% OF CAPACITY
BHD	2218	254,303 kW	70%
MPD	227	108,113 kW	30%

In addition to the distribution-connected projects, Versant also has nearly 1 GW of renewable generation connected to its transmission grid (Table 2-12).

TABLE 2-12—VERSANT TRANSMISSION-CONNECTED RENEWABLES BY TYPE			
GENERATION TYPE	PROJECTS	CAPACITY [20]	COMMENTS
Solar	2	120 MW	Includes 100 MW project in service 2026
BESS	1	20 MW	
Wind	11	684 MW	
Hydro	5	171 MW	Includes Brookfield Power net export, 126 MW

Figure 2-7 illustrates the growth of solar projects installed since 2015. The compound annual growth rate (CAGR) is 21.15%, reflecting consistent market expansion driven by declining technology costs, favorable policies, and rising customer adoption. While the number of projects has grown steadily year-on-year, a notable spike in total nameplate capacity occurred in 2024, with a large number of Level 4 solar projects (i.e., 63) being commissioned. This caused the overall solar nameplate rating to increase by 148.6% over the previous year. This sharp increase in capacity highlights a shift toward larger-scale deployments in recent years.

Contributing to the shift are the 2019 updates to the Net Energy Billing (NEB) program and key updates to Chapter 324 (interconnection procedures for small generators). The combination of the 2019 NEB expansion and the Chapter 324 reforms created an environment that lowered barriers for developers, encouraged community solar and commercial project growth, and supported the rapid scaling of DERs. Specifically, the 2019 NEB changes increased project size limits to 5 MW, allowed shared financial interest, introduced a monetary credit model, and enabled community solar participation. These updates led to a sharp increase in solar project applications, particularly in the Level 4 category above 2 MW. The key updates for Chapter 324 specifically resulted in streamlined processes for projects (Level 1 to Level 4), improved cost allocation, greater transparency in upgrade requirements, and a formal dispute resolution process. These changes have supported steady growth in DERs across Versant's system. Versant anticipates that more recent changes to Maine's NEB program may slow the growth of large projects and refocus development activity on smaller projects.

By the end of 2024, the total distributed solar capacity in the Versant system reached approximately 367 MW, which is equivalent to 101% of the 2024 system peak. Because DER growth at Versant has surpassed system peak demand, the utility faces significant technical challenges. These challenges include: (1) DER capacity constraints; (2) voltage rise and power quality issues from high DER output; (3) impacts to protection schemes due to bidirectional flows; and (4) hosting capacity. Versant

[20] This capacity is for systems that are connected to the primary distribution system. This does not include renewable energy systems that are connected to transmission or sub-transmission systems.

anticipates adopting advanced distribution management tools and techniques to confront these challenges as DER penetration grows.

Meanwhile, the milestone of 100% solar generation was observed several times in 2024 in parts of Versant's service territory. For example, from noon to 4 p.m. on Wednesday, May 1, Versant's service territory in the Fort Kent area was powered entirely by local solar energy. This feat was repeated on May 2 and May 3, 2024.

Maine's clean energy goals target 80% renewables by 2030 and 100% renewable by 2040 and these goals are reflected in the MPUC Order. At the time of the IGP order, Level 4 solar projects were the primary driver of DER capacity additions on Versant's system.

Versant's Distributed Generation Interconnection Process highlights four levels of interconnection facilities. Each level, as well as their associated definition, are highlighted below:

- **Level 1:** Certified, Inverter-Based Generating Facilities Not Greater than 25 kW (i.e. Rooftop solar).
- **Level 2:** For certified generating facilities that pass certain specified screens and have a power rating of 2 MW or less.
- **Level 3:** For certified generating facilities that: (a) pass certain specified screens; (b) do not export power beyond the Point of Common Coupling; and (c) have a power rating of 10 MW or less.
- **Level 4:** For all generating facilities that do not qualify for Level 1, Level 2, or Level 3 interconnection review processes, and are not subject to the jurisdiction of FERC.

In 2025, the DER interconnection trend shifted. Level 4 DER activity has significantly decreased, while Level 1 rooftop solar continues to grow. Smaller systems (Level 1) remain viable due to streamlined processes and steady customer demand. Versant is focused on managing high volumes of small-scale DER while addressing legacy impacts from earlier large-scale growth.

In the next 10 years, Versant's total distributed solar capacity is expected to continue increasing, potentially reaching as high as 1,000 MW under the fastest-growth scenario—equivalent to 275% of the 2024 system peak. Additional details on the DER forecasting approach are provided in Section 3.

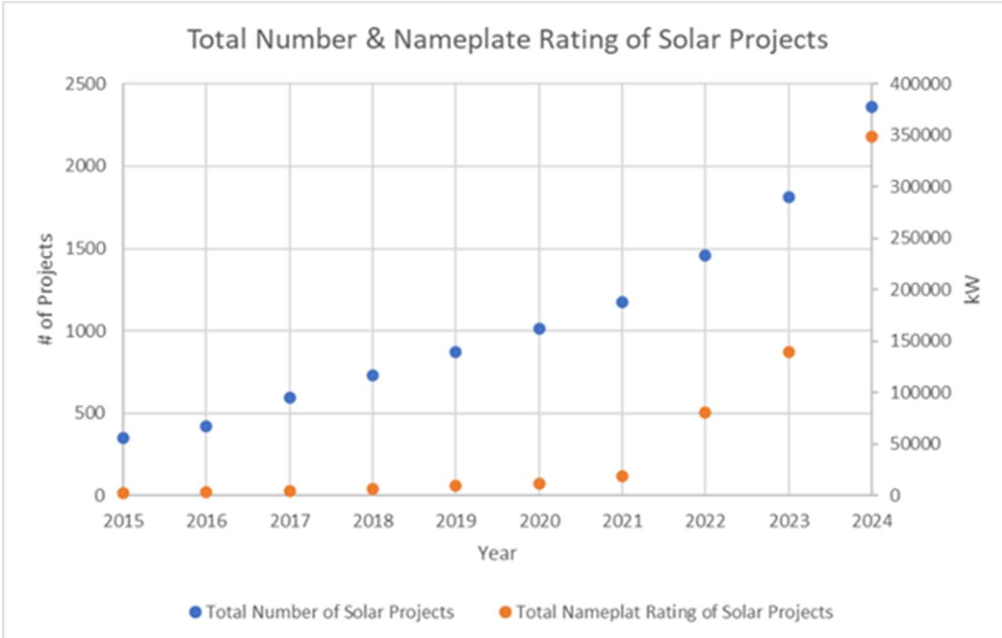

Figure 2-7 - Total number and Nameplate Rating of Distributed Solar Projects (2015-2024)

With respect to combination systems (solar with storage, and/or wind systems), Table 2-13 shows the recent acceleration in battery storage deployment across the system. Prior to 2023, there were only four combined solar and battery projects, and no battery-only systems installed. This changed markedly in 2024, when 24 new combined solar and battery projects were interconnected, along with the first five battery-only systems. The emergence of battery-only systems and the sharp increase in combined projects in 2024 reflect a growing emphasis on energy storage as a flexible grid asset.

TABLE 2-13 – BATTERY STORAGE DEPLOYMENT			
YEAR	COMPLETED PROJECTS	TOTAL NAMEPLATE RATING	TOTAL ENERGY STORAGE
2019	3	7.72 kW	10.0 kWh
2020	4	15.32 kW	19.8 kWh
2021	4	15.32 kW	19.8 kWh
2022	4	15.32 kW	19.8 kWh
2023	4	15.32 kW	19.8 kWh
2024	28	239.72 kW	401.6 kWh

As show in Figure 2-8, deployment of other DER technologies has remained relatively flat over the past several years. As of 2017, there were 96 projects in this category, and by 2024, that number had increased by only five additional projects. This limited growth contrasts sharply with the significant expansion seen in solar and battery storage deployments. The data suggest that in recent years, customer interest and development activity have shifted decisively toward solar PV and energy storage systems, which together now dominate the DER landscape.

Energy storage systems are a customer choice available today under Chapter 324. Customers can interconnect storage systems to serve their own load, and Versant plays an active role in enabling these projects by facilitating application review, conducting technical studies, and supporting safe integration into the grid. While the pathway is open, adoption is ultimately driven by customer and developer choices. Economic feasibility remains a key factor, and without direct incentives, uptake has been limited

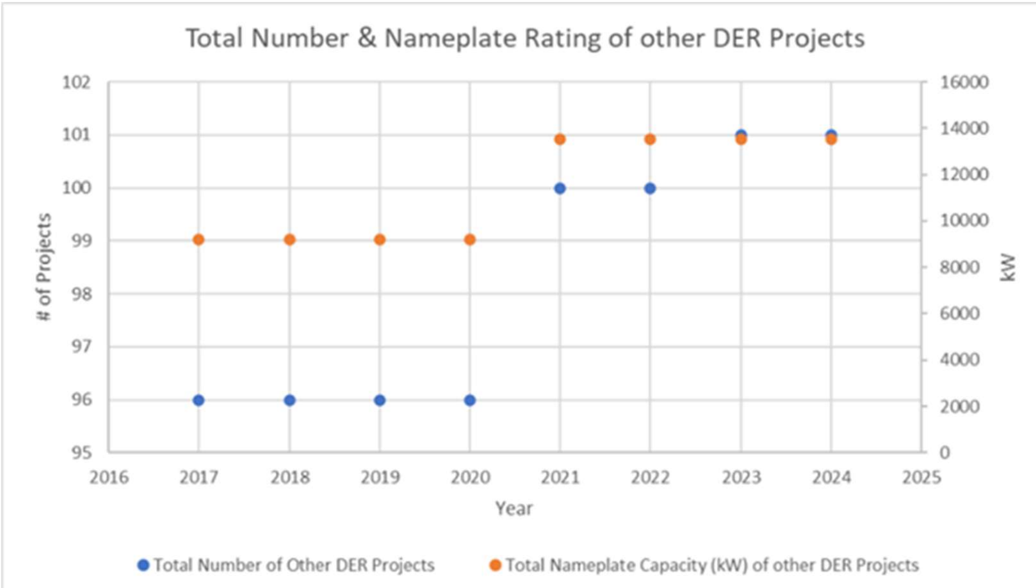

Figure 2-8 - Tota-l Number and Nameplate Rating of Other DER Projects

In addition to the in-service DER project list, DER projects currently in the interconnection queue have been incorporated into the overall DER capacity forecasting effort. These queued projects have already initiated the interconnection process, with submitted applications, feasibility studies, and preliminary approvals. As a result, they represent a committed pipeline of resources that are likely to materialize within the forecast horizon. Table 2-14 presents the total number of DER projects in the queue and their combined nameplate capacity—reported in kW and kilowatt-hours (kWh) for energy storage—broken down by technology type, for the period from December 2024 through December 2026.

TABLE 2-14 – DER INTERCONNECTION QUEUE			
DER TYPE	QUEUE	CAPACITY	STORED ENERGY
Solar PV Systems	343 Projects	147,460 kW	N/A
BESS	2 Projects	15 kW	24 kWh
Combination (PV, BESS, and/or Wind)	13 Projects	231 kW	188 kWh
Other (Fuel cell, wind, etc.)	4 Projects	1426 kW	N/A

Table 2-15 summarizes the DER interconnection queue for BHD and MPD.

TABLE 2-15 – VERSANT DER DEPLOYMENT SUMMARY			
OPERATING REGION	PROJECT QUEUE	QUEUE CAPACITY	% OF CAPACITY
BHD	265	87,793 kW	59%
MPD	97	61,339 kW	41%

Storage is increasingly a foundational element in integrating DERs into the distribution grid. Energy storage systems provide operational flexibility needed to manage variability, reduce curtailment, and maintain system reliability. To maximize their value, BESS should be a grid-integrated asset, not just a customer-side resource. To function as a grid-integrated asset, Versant will need the ability to coordinate and manage storage assets. Storage may be capable of providing multiple grid benefits including peak shaving, support for voltage regulation, frequency response, and contingency events.

2.4.1 TRANSPORTATION ELECTRIFICATION

Following the broader trends in DER development across the Versant service territory, EV adoption is another key contributor to future load growth and grid dynamics. However, unlike DERs, utilities do not have specific visibility into EV deployment across their systems. This lack of granular data limits the ability to fully assess the spatial and temporal impacts of EV charging across the service territory.

Versant leverages publicly available EV registration data at the state level. The Maine EV registration data used in this study was sourced from the Emission Inventory Program, maintained by the Maine Department of Environmental Protection.[21] This dataset includes mid-year and annual EV registration counts. For annual EV registration counts, geographic information by mailing city and ZIP code is provided dating to 2020. For mid-year EV registration counts, data are provided at the state level. According to the mid-year dataset (issued 7/30/2025), EV data are as follows in Table 2-16.

TABLE 2-16 – MAINE MID-YEAR VEHICLE REGISTRATION COUNTS (2025)

ELECTRIFICATION TYPE	COUNT
Battery Electric Vehicle (BEV)	10,073
Hybrid Electric Vehicle (HEV)	39,060
Motorcycle Electric (ME)	25
Neighborhood Electric Vehicle (NEV)	422
Total	**59,022**

These records reflect a CAGR of approximately 19.79% over a five-year period (2020 to 2025). By 2050, about 60% of Maine's electricity demand growth is expected to come from transportation electrification, as the state shifts from fossil fuel-powered vehicles to EVs.[22]

Maine EV registration data was used to develop an allocation method for estimating the number of electric vehicles (EVs) in Versant's service area. The method includes battery electric vehicles (BEVs), hybrid electric vehicles (HEVs), and plug-in hybrid electric vehicles (PHEVs).

The estimate indicates about 5,400 EVs in 2020, increasing to roughly 11,300 in 2024. Local EV data are not available to confirm accuracy, so the estimates were compared to statewide registration data. The comparison shows that Versant represents about 21% of Maine's EVs each year, which aligns with its share of customers in the state. This consistency provides a reasonable basis for the estimates.

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[21] Me. Dep't of Env't Prot., *Vehicle Emissions and Greenhouse Gas Data*, https://www.maine.gov/dep/air/mobile/vehicle-data.html (last visited Jan. 9, 2026).

[22] *Maine Energy Plan 2040: Analysis and Insights*, Maine Governor's Energy Office, at 27 (Jan. 2025), https://www.maine.gov/energy/sites/maine.gov.energy/files/2025-01/Maine%20Pathways%20to%202040%20Analysis%20and%20Insights.pdf.

Additional details regarding the EV allocation approach can be found in Section 3.

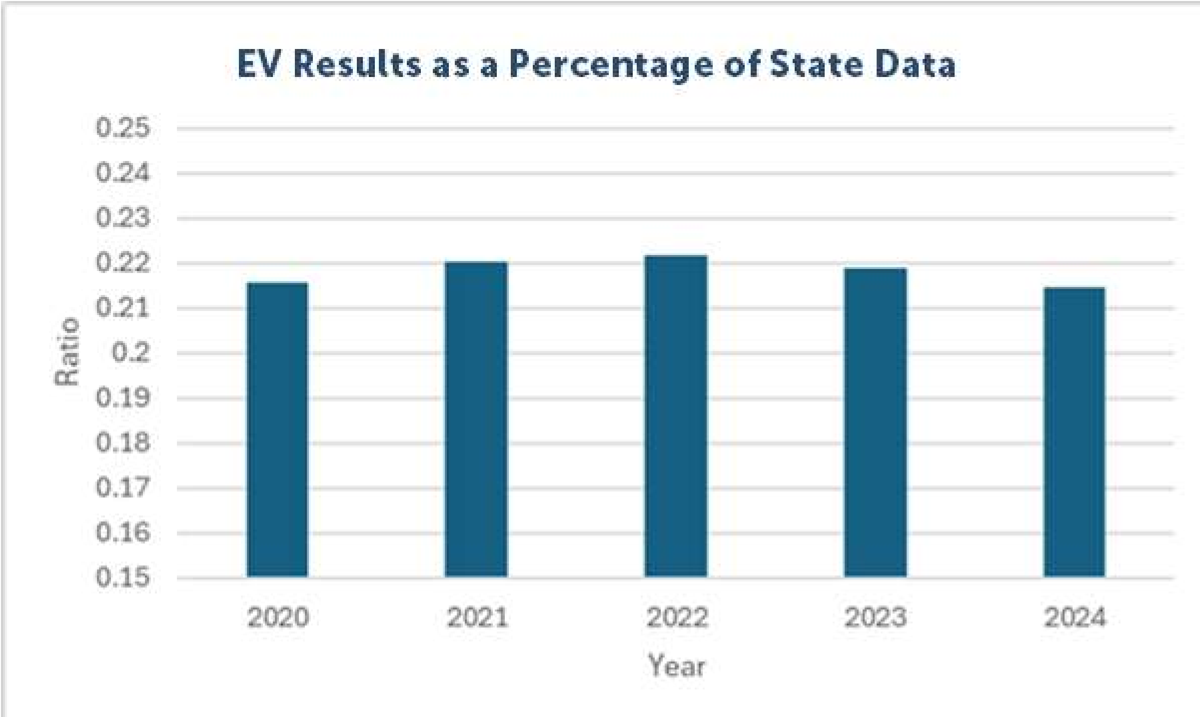

Figure 2-9 - EV Results as a Percentage of State Data

Regarding EV charging stations, as of early 2025, there are more than 500 public EV charging locations in Maine with over 1,000 charging ports, including a mix of Level 2 and DC fast chargers.[23]

The accelerating deployment of DERs, alongside the rapid adoption of EVs, is transforming the operational dynamics of the electric grid. Traditionally, power was designed to flow one direction, traveling from centralized generation plants supplying electricity to end consumers. Load was relatively predictable, and generation was dispatchable and controllable. The rise of DERs and EVs is reshaping grid operations in ways the legacy infrastructure was not designed to accommodate. For example, DERs can cause reverse power flows and voltage challenges while EVs can create unpredictable, high-impact loads that can stress local infrastructure and impact forecasting. The impact of DERs and EVs prompts the need for modernized planning tools to capture the introduction of such complexities.

Given the high level of uncertainty in DER development resulting from shifting policies and market conditions, scenario-based planning and locational hosting capacity analyses are becoming increasingly important to assess where infrastructure upgrades would be needed or where large-scale DERs can be optimally integrated. In Maine, an average annual EV growth rate of up to 20.8% has the potential to produce new peak loads that challenge the traditional load growth patterns, placing additional pressure on local grid infrastructure. These dynamics indicate the need for a better understanding of customer EV adoption and charging patterns, enhanced forecasting framework, and the potential deployment of advanced grid monitoring and control technologies.

[23] The Efficiency Maine Trust, *Find a Public Charger*, https://www.efficiencymaine.com/charging-station-locators/ (last visited Jan. 9, 2026).

3. FORECASTING AND SCENARIO DEVELOPMENT

3.1 FORECASTING AND SCENARIO DEVELOPMENT OVERVIEW

In an environment of rapidly shifting policy mandates, customer choice, and emerging technologies, conducting accurate and detailed load growth studies is more critical than ever. Versant's IGP offers a structured framework for evaluating distribution system needs by aligning load growth forecasts with technology integration, investment planning, and reliability goals.

The IGP aligns load forecasts with technology, investment, and reliability to meet tomorrow's grid needs.

The goal of forecasting and scenario development efforts for this IGP is to facilitate a transparent, data-driven assessment of 10-year load growth for Versant that can contribute to timely and cost-effective infrastructure planning. This framework accounts for a wide range of drivers, including:

- Historical and projected customer demand
- Electrification trends (e.g., EVs, building decarbonization)
- DER adoption
- Climate and weather-related impacts
- Local economic and demographic growth patterns
- State goal and policy factors

Versant's forecasting framework emphasizes scenario-based forecasting to reflect uncertainty regarding future conditions. Within the framework, hundreds of scenarios were designed to test system resilience and uncover "no regrets" investment opportunities that empower customer choice and align with Maine's state policy goals. The forecast results are key inputs into system modeling analysis, helping to prioritize grid investments, support regulatory compliance, and maintain system reliability.

The Act requires IGP forecasts to include projected load, accounting for end-use electrification, EE, and DER, and incorporation of at least two planning scenarios: a baseline forecast and one with high DER and electrification penetration.[24] Specifically, the baseline forecast should align with the ISO-NE's 2024 CELT report,[25] based on a 50/50 weather year, and should include assumptions for DG, transportation electrification, and heating electrification. Note that a 50/50 weather year refers to a forecast scenario in which there is a 50% probability that actual peak demand will be either higher or lower than the projected value, reflecting average weather conditions. In contrast, the high DER and electrification forecast should align with the 2024 CELT Report, based on a 90/10 weather year. With a 90/10 weather year, there is a 90% probability that the actual load will be below the forecast value and only a 10% probability that it will be above, which can be used for planning under extreme weather conditions. For each forecast, six seasonal load snapshots are required, including:

- Three peak snapshots

[24] P.L. 2021, ch. 702, § 8.

[25] System Planning, *2024 CELT Report: 2024-2033 Forecast Report of Capacity, Energy, Loads, and Transmission*, ISO New England Inc. (May 17, 2024) https://www.iso-ne.com/static-assets/documents/100011/2024_celt_report.xlsx (*2024 CELT Report*).

  - Summer daytime peak
  - Summer evening peak
  - Winter evening peak
- Three minimum load snapshots
  - Daytime minimum
  - Evening minimum
  - Spring minimum

Versant worked to further define these six snapshots by utilizing local historical solar irradiance data and current rate schedules to determine the months and time periods corresponding to the seasonal load snapshots required by the MPUC Order, as shown in Table **3**-**1**.

TABLE 3-1 – DEFINITIONS OF SIX SEASONAL LOAD SNAPSHOTS				
SEASON	Winter	Spring	Summer	Fall
MONTHS	DEC-FEB	MAR-APR	MAY-SEPT	OCT-NOV
DAYLIGHT HOURS	8am-4pm	7am-7pm	6am-8pm	8am-6pm
EVENING HOURS	4pm-7pm	7pm-10pm	8pm-11pm	6pm-9pm

3.2 FORECASTING FRAMEWORK AND METHODOLOGY

This section introduces two load forecasting methodologies used in the IGP: the top-down and bottom-up approaches. These methodologies are designed to ensure compliance with MPUC guidelines while also incorporating important local factors, including non-coincident feeder peaks, DER adoption, transportation and heating electrification, policy changes, and demographic trends that may influence electricity demand and overall system needs.

3.2.1 TOP-DOWN METHOD OVERVIEW

According to the requirements of the MPUC Order, the top-down approach utilizes the 2024 ISO-NE CELT hourly sub-area forecasts as the reference for the Versant BHD system. The sub-area forecasts were then assigned to Versant BHD distribution substations and individual circuits based on the historical peak load contribution ratios, to build a baseline forecast and a high DER penetration and electrification forecast via six load snapshots.

It is important to note that ISO-NE's 50/50 and 90/10 forecast cases differ solely based on weather factors. In both cases, the growth in technology adoption, including DERs and EVs, remains the same. Therefore, while the ISO-NE 90/10 forecast corresponds to higher loads, these are driven by more aggressive (hotter or colder) weather assumptions, rather than by higher DER penetration and/or electrification forecasts.

For the Versant MPD system specifically, the 2023 Integrated Resource Plan (IRP) report by NB Power was referenced, which sells capacity and energy to the MPD system. The top-down framework is the same for both regions, with slightly different reference datasets. Additional details are provided in Section 3.4.

3.2.2 BOTTOM-UP METHOD OVERVIEW

Given the challenges of identifying distribution grid needs using a transmission-level peak forecast, the evaluation of localized, non-coincident peaks (i.e., feeder-level peaks) allowed Versant to better capture distribution-specific demand characteristics. As stated in the MPUC order, this IGP effort is focused primarily on distribution grid planning.[26] This focus reinforces the value of analyzing and forecasting localized non-coincident peaks. Meanwhile, to balance the use of historical load data with emerging goals and targets, it is necessary to design multiple high renewable energy and transportation electrification scenarios as "what-if" analyses to assess grid needs under the State's 2040 vision of 100% clean electricity and broad decarbonization. For these reasons, Versant developed a third bottom-up forecasting method in addition to the two required forecasts, capable of better capturing location-specific demand growth, customer adoption variability, and seasonal effects—factors that are particularly significant in Maine, where heating loads, DER adoption, and transportation electrification growth vary regionally.

Generally, the bottom-up forecast is an approach that relies on feeder-level historical data and focuses on feeder-level load projections. For each circuit, a 10-year scenario-based forecast was developed using high granularity historical data sources, including SCADA data, GIS information, the solar interconnection queue, EV registration data, and population data. The bottom-up method facilitates the use of highly granular data and incorporates local variables within this IGP, ensuring that distribution circuit level grid needs are accurately identified during the model analysis

[26] MPUC Order at 5.

3.2.3 STRENGTHS, WEAKNESSES, AND LIMITATIONS OF LOAD FORECASTING METHODOLOGIES

Table 3-2 summarizes the strengths, weaknesses, and limitations of the top-down and bottom-up methods.

TABLE 3-2 – EVALUATION OF LOAD FORECASTING METHODOLOGIES

CATEGORY	TOP-DOWN FORECAST	BOTTOM-UP FORECAST
Methodology	Start with upstream load forecasting and disaggregate to lower level (coarse granularity)	Develop forecasts for individual circuits and include historical and local data (fine granularity)
Data Source	Upstream forecasts, regionally based, Allocation ratios	Historical data including SCADA, DER queue, EV registration data, weather data, census, upstream itemized forecasts, state policy goals
Strengths	Consistent with upstream assumptions and well-suited for transmission level/system-wide view	Focus on distribution level grid needs and capture localized variations and trends
Challenges	Potential to over/under allocate data on the distribution level, challenging to analyze different scenarios for EV and DER adoption	Requires more extensive and local data, less effective for transmission level/system-wide view

Beyond this comparison, it is important to consider how each approach aligns with IGP priorities:

- **Reliability and resilience improvements:** Bottom-up forecasts account for localized weather impacts across diverse regions and reflect geographic differences, such as coastal vs. inland or urban vs. rural, thereby supporting reliable and resilient grid operations. Top-down forecasts provide a system-level view to identify broader trends and potential reliability risks.
- **Improve data quality and integrity:** The bottom-up method enables utilities to leverage granular feeder-level data, allowing planners to constrain forecasts using historical regional adoption patterns to avoid unrealistic projections. The top-down approach offers system-wide consistency and can validate bottom-up insights.
- **Promote flexible management of consumer resources and energy consumption:** Bottom-up forecasts reflect customer dynamics and regional differences, enabling targeted, flexible management of DERs and electrification resources. Top-down forecasts complement this by offering a high-level perspective for system-wide planning and resource allocation.

Combining top-down and bottom-up methods ensures alignment with all planning priorities while capturing both system-wide trends and localized, customer-specific insights.

3.2.4 CONSIDERATIONS FOR CREATING THE INITIAL VERSANT IGP

This study is Versant's inaugural IGP. Given its foundational nature, and to ensure its long-term value and robustness, its framework has been shaped by the following three core principles.

3.2.4.1 Build a Comprehensive Foundation

The primary objective of the first IGP is to develop a broad and inclusive framework. To that end, a wide list of variables that could affect grid needs was incorporated, including but not limited to transportation electrification trends, DER adoption (i.e., BTM and front-of-the-meter [FTM] solar), heating electrification, EE, population cap, weather variability, and potential system limits (i.e., generation/load ratio). Subsequent revisions of the IGP will provide the ability to fine-tune or expand these inputs by using additional data, while the initial draft aims to build an effective platform to identify potential system violations under system stress conditions. All results will be subject to future review to ensure safety and reliability in a rapidly evolving grid driven by customer choices and policy goals.

3.2.4.2 Leverage the Most Granular Data Available

Versant used the most granular data available at the time for this IGP. The Company anticipates additional data from AMI, local EV charging stations, and detailed usage patterns for advanced energy technologies such as heat pumps are likely to become available for the next iteration. Versant's data framework is designed to utilize these new data to identify future grid needs and techniques to accommodate new growth.

3.2.4.3 Stress-Testing with Stressed-Case Scenarios

In addition to creating realistic load scenarios for each load snapshot, this IGP built in stressed-case scenarios for both peak and minimum load snapshots. Although some of the assumptions may appear unlikely, such as no DER generation in peak load cases, it is essential that the scenarios stress the system and identify potential operational challenges. Evaluating stressed conditions helps ensure resource adequacy and grid dependability. This is a particularly important consideration given recent industry challenges, such as Hawaiian Electric Company's (HECO) load curtailments and California's rolling brownouts and blackouts. These examples highlight the importance of proactively assessing extreme conditions. As a cornerstone of the framework, this inaugural IGP is intended to flag all potential violations. However, not every flagged issue requires immediate investment. Flagged conditions will undergo further review to determine whether they represent real system needs. Only after comprehensive subsequent analysis will potential solutions and justifications be developed to support investment proposals. Testing the system under highly stressful conditions provides confidence that it will operate reliably, and without significant operational problems under a range of potential conditions.

3.3 DATA AVAILABILITY AND REVIEW

3.3.1 2024 CELT REPORT

The CELT Report presents a range of data and forecasting results pertaining to the ISO-NE Reliability Coordinator Area. The data are commonly used in transmission planning and operations reliability studies. Specifically, the 2024 CELT Report[27] reflects demographic, economic, and market information available from 2024 through winter 2033/2034, including scheduled and proposed transmission changes, project listings, and summaries of future resources. This 2024 CELT edition supersedes prior CELT publications and represents the efforts of market participants working jointly with the ISO, under the review of the New England Power Pool's Reliability Committee and its subcommittee, the Load Forecast Committee. While the 2025 CELT Report reflects updated assumptions on regional DER adoption and electrification, the 2024 CELT Report was used in this analysis to ensure consistency with this IGP's baseline date and modeling timeline. At the time of model development (August 2024), the 2025 CELT Report had not yet been released, and using the 2024 CELT Report provided a stable and internally consistent dataset for scenario development.

Key data highlights for Maine in the 2024 CELT Report are as follows:

- The gross summer load forecast for Maine (50/50 weather scenario) shows an increase from 2,131 MW in 2024 to 2,276 MW by 2033, representing a 145 MW rise (+6.8%).

[27] *2024 CELT Report*.

- For the "net load" under 50/50 weather scenario, Maine's net summer load is projected to increase from 1,954 MW in 2024 to 2,398 MW by 2033, an increase of 444 MW (+22.7%).
- In the winter evening peak scenario under 90/10 weather scenario, gross load moves from 1,980 MW in 2024 to 2,062 MW in 2033, a total change of 82 MW (+4.1%); high adoption trajectories for heating and transportation electrification push net winter load to 2,997 MW by 2033.
- The 2024 CELT Report notes that one of the drivers of increased demand will be heating and transportation electrification. For Maine, the 2024 CELT Report aligns with state goals, including installation of at least 100,000 new heat pumps by 2025 and use of 219,0000 light-duty EVs by 2030. In terms of load, heating electrification is projected to increase to 600 MW by 2033, while transportation electrification is expected to reach 407 MW under the winter peak scenario.
- Regarding DER, the 2024 CELT Report estimates a peak load reduction of approximately 80.9 MW in 2024, increasing to about 95 MW by 2033, a net increase of 14.1 MW (+17.4%).

3.3.2 NB POWER IRP AND 7-YEAR NORTHERN MAINE INDEPENDENT SYSTEM ADMINISTRATOR OUTLOOK

In addition to CELT 2024, this IGP also cites NB Power's 10-year IGP and the seven-year NMISA outlook to provide upstream planning for the Versant MPD.

The NB Power 2023 (IRP) outlines long-term energy and capacity needs, resource mix projections, and policy drivers for the province of New Brunswick.[28] The IRP identifies electrification rate and technological innovation as key uncertainties and responds to them by developing a scenario-based approach. Such a report provides valuable insights to MPD's 10-year load forecasting because it provides guidance on how regional electrification, EE, and policy modification could influence demand in the future.

The seven-year forecast by NMISA was published in May 2024, which was treated as a prospective examination of the MPD system. It includes seven-year energy and peak load forecasts, generation resource availability, and transmission system planning within a mid-term perspective. The report helps place local load development in perspective with the overall operating state of the NMISA territory and serves as a benchmark for measuring Versant MPD load forecasts versus regional expectations.

3.3.3 PUBLIC DATASETS

The following publicly available datasets were leveraged to inform EV adoption, state policy, and base load forecasting analysis, which provide insight into historical trends, policy-driven targets, regional planning benchmarks, and localized demographic shifts:

3.3.3.1 Vehicle Emissions and GHG Data

Considering that historical demand data of EVs in the Versant service territory is not available, as discussed in Section 2, historical EV registration data was gathered from the Electric Vehicle Population datasets found in the Vehicle Emissions and Greenhouse Gas Data maintained by the Maine Department of Environmental Protection.[29] The dataset used for this analysis

[28] N.B. Power, *2023 Integrated Resource Plan: Pathways to a Net-Zero Electricity System*, https://www.nbpower.com/en/about-us/our-energy/integrated-resource-plan (last visited Jan. 12, 2026).

[29] Me. Dep't of Env't Prot., *Vehicle Emissions and Greenhouse Gas Data*, https://www.maine.gov/dep/air/mobile/vehicle-data.html (last visited Jan. 9, 2026).

was last updated on February 20, 2025, and provides annual vehicle registration counts for the State of Maine, categorized by electrification technology including BEVs, HEVs, and PHEVs, as well as other categories such as Electric Motorcycles (EMs) and Neighborhood Electric Vehicles (NEVs). Each record contains key attributes such as the date of registration, ZIP code, and the number of registered vehicles by type. For EV adoption forecasting, focus was placed on BEV, HEV, and PHEV registrations, as these vehicle types represent the core segments of the electrified vehicle market and are most relevant for understanding future electricity demand.

3.3.3.2 State Goal: Maine Won't Wait

To align with state goals, this study utilizes the *Maine Won't Wait* (MWW) annual report published by the Maine Climate Council.[30] The MWW plan was launched in December 2020, and it is the State's four-year climate strategy that includes reducing GHG by 45% by 2030 and 80% by 2050 and ultimately achieving carbon neutrality by 2045. The 2024 annual report (updated November 2024) retains those core 2030 and 2050 targets but expands the strategy to include a stronger focus on waste-sector emissions, land-use planning, energy-efficient housing, affordability of clean energy, and climate resilience for infrastructure, to limit global warming to 1.5 degrees Celsius this century. One of the most significant aspects of the plan is transitioning to cleaner transportation, with ambitious EV adoption goals.

The original MWW plan had a goal of 219,000 light-duty EVs on the road by 2030. However, in the 2024 MWW 2.0 updated version, the goal was lowered to 150,000 EVs by 2030 to more closely track current adoption levels and market conditions. At the end of 2024, there were approximately 17,500 registered electric and plug-in hybrid vehicles in Maine—significant progress, but far short of the 2030 goal. Versant's role is to maintain a grid capable of supporting and interconnecting these technologies and the lower adoption numbers primarily reflect customer choices and policy changes.

3.3.3.3 Town-Level Population Projections

Considering the relevance of population change for local load and EV development, demographic projections were gathered from the Maine State County Population Projections 2040 maintained by the Maine Department of Administrative and Financial Services.[31] This file provides a detailed forecast of population trends at both state and county levels, with data segmented into five-year intervals reaching out to 2040. These projections are part of a broader series issued by Maine's Office of the State Economist, superseding earlier forecasts from 2023. In this file, county- and town-level trends reflect a range of growth patterns: Some areas continue modest expansion, such as Cumberland (1.8%), Hancock (1.1%), and York (10.7%), while others see stabilization or decline through 2040, such as Lincoln (-2.8%), Penobscot (-2.2%), and Oxford (-0.9%).

3.3.4 VERSANT DATASETS

To perform a load forecasting study, this study integrates multiple utility data sources, including:

3.3.4.1 Historical Feeder and Transformer Data

Feeder-level time-series data was collected from SCADA, including load profiles, voltage, and current readings. Data span from 2012 to 2023 with hourly resolution, which allows for trend analysis. In some cases, Versant needed to manually address limited gaps in data before completing forecasting datasets. Versant anticipates that availability and quality of data will improve by the next iteration of the IGP.

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[30] Maine Climate Council, *Maine Won't Wait: Maine's Climate Action Plan – 2024 Update* (Nov. 2024), https://www.maine.gov/climateplan/sites/maine.gov.climateplan/files/2024-11/MWW_2024_Book_112124.pdf (MWW).

[31] Maine Office of the State Economist, *Demographic Projections*, https://www1.maine.gov/dafs/economist/demographic-projections (last visited Jan. 9, 2026).

3.3.4.2 Distribution Model and GIS Network Information

Detailed system information was extracted from Versant CYME models, which includes electrical configuration (i.e., transformer ratings, conductor types, voltage regulation equipment, and switching devices). The CYME model is integrated with GIS data, which holds the spatial layout of feeders and customers. The GIS layer enables the accurate mapping of infrastructure and service areas, in addition to identification of customer connections at the transformer level. The CYME and GIS data combined provide a unified view of the physical and electrical network topology, enabling detailed load allocation, connectivity tracing, and scenario modeling.

3.3.4.3 In-Service and Queue DER Project List

A comprehensive list of DER projects, including solar PV, battery storage and other technologies, was developed. Overall data span from 2020 to 2026. The list indicates whether a project is in service or in the interconnection queue, with associated metadata such as project level (i.e., Level 1, 2, 3, and 4), district, nameplate rating, storage kW if available, generator number, location, substation, circuit ID, type of interconnect, fuel type, and in-service date.

3.3.4.4 Efficiency Maine Trust Data

Near the end of the load forecasting task, after Milestone 0.5 and 1.0 discussion, two extra datasets were made available to the Company by EMT that provided potential transportation and heating electrification growth across the Versant service area. Versant appreciates EMT's partnership in this area. While the availability of the data arrived mid-modeling, after many of the initial forecast models had been developed, they did provide validation and a contextual foundation for scenario creation and geographic allocation of electrification effects.

The first dataset from EMT identifies the total number of EVs per Versant feeder. EMT developed this dataset from EV registration location it collected and spatially matched to each feeder in the Versant system. Because EMT only recently began to collect EV data and has not yet accumulated several years of historical data for trending analysis, a feeder-level EV trend analysis could not be conducted based on this data alone and reliance was placed on statewide historical EV data and a series of assumptions (i.e., section 3.5.5). However, Versant anticipates this data source may be valuable for making more accurate estimates of the number of EVs on each feeder in the next iteration of the IGP.

The second dataset included heating system registration data specifically for heat pump electrification. EMT used program participation and other data to estimate active heating electrification conversions, again with correlation to the Versant service area. Residential as well as commercial heating system adoptions were represented in the dataset, categorized by feeder-level location where possible. Although timing did not allow for this information to be utilized in the initial heating electrification load estimates, these data helped Versant gauge the relative magnitude of heating electrification across its service territory and serves as a benchmark when comparing CELT-based heating load growth in scenarios.

The data sources provided by EMT enable Versant to understand EV and heat pump load consumption at the feeder level, allowing the Company to validate whether the assumptions regarding disaggregating state-level data to the feeder-level are reasonable, thereby demonstrating a significant positive impact. Looking ahead, these data sources will serve as a foundation for more granular analyses in future IGP efforts, helping to refine forecasts and assess grid impacts.

3.4 TOP-DOWN DISTRIBUTION-LEVEL FORECASTING

3.4.1 OVERVIEW OF TOP-DOWN APPROACH

Following the MPUC Order, as described in Section 3.1, a top-down distribution-level forecasting approach was developed that begins with upstream planning guidance (i.e., ISO-NE 2024 CELT subarea 10-year forecasts and NB Power 10-year IGP) and allocates projected growth to individual feeders based on historical peak contributions.

The top-down method provides a scalable framework for aligning Versant feeder-level projections with upstream forecasting trends and provides a foundation for evaluating system-wide impacts under different scenarios,

At the same time, the top-down method has several limitations when applied to a distribution-focused grid needs analysis:

- **Reduced Accuracy for Feeder-level Peak Identification:** Aggregated peaks can obscure feeder-level peaks due to differences in peak timing, especially when high penetration of DERs and rapidly growing EV demand influence local load patterns. As a result, peak load disaggregation derived from top-down forecasts may not accurately reflect actual feeder conditions.
- **Limited Granularity:** Top-down methods rely on aggregated regional-level forecasts, which can mask localized variations in customer loads and feeder-specific characteristics. This makes it difficult to accurately capture the historical trajectory of localized electrification and DER development, as well as to make reliable long-term projections.
- **Limited Support for Scenario Analysis:** Distribution-level planning requires evaluating “what-if” scenarios, such as the impact of state clean energy and electrification goals. The top-down method provides limited flexibility to model these scenarios with sufficient detail.

These constraints motivated Versant to design a bottom-up forecasting method, which it believes complements the strengths and limitations of the top-down approach. In future IGPs, Versant supports the utilization of a bottom-up approach, and additional details can be found in Section 3.5.

3.4.2 STAKEHOLDER ENGAGEMENT FOR TOP-DOWN APPROACH

Versant’s 0.5 and 1.0 IGP Milestone Meetings were held on November 14, 2024, and February 28, 2025, respectively. Among the primary agenda items for these meetings were detailed discussions of both the top-down and bottom-up forecasting approaches. Versant initially covered the method, design, and data sources required for these forecasts during the Milestone 0.5 meeting. Following a request from EMT for additional discussion of the 2024 CELT forecast results and load allocation, a follow-up call was held. During the Milestone 1.0 meeting, the entire top-down load forecasting method was presented and received positive feedback from stakeholders.

3.4.3 DATA SOURCE AND PROCESSING

For the BHD, the highest resolution forecasts were used from the 2024 CELT Report: the Subarea 8,760 hourly load forecasts.[32] All ISO-NE hourly forecasts are delivered in the industry standard Edison Electric Institute (EEI) text file format, including hourly subarea load forecasts beginning Jan. 1, 2024, and continuing through all hours of the year. While the EEI format is a standard data exchange structure, data processing is still required to extract useful planning inputs for this IGP.

[32] ISO New England, Inc., *Load Forecast*, https://www.iso-ne.com/system-planning/system-forecasting/load-forecast (last visited Jan. 9, 2026).

Raw hourly data first was converted to formal time-series format suitable for thorough analysis. Peak load snapshots like the annual summer day peak, summer evening peak, and winter peak were calculated by identifying the peak load levels in preselected time frames (defined in Table **3-1**). Daytime minimum, spring minimum, and evening minimum snapshots were obtained by finding the minimum load levels in their respective time frames.

3.4.4 SCENARIO DEVELOPMENT

As directed by the MPUC, two load forecasting scenarios were developed for this IGP to capture a range of plausible future outcomes:

3.4.4.1 Baseline Scenario

The baseline scenario represents a moderate outlook for future load growth and electrification. In the top-down forecasting process, the ISO-NE 2024 CELT 50/50 forecast results were used as the foundation. The 50/50 forecast reflects conditions under which there is a 50% probability that actual peak load will be higher or lower—essentially representing a "most likely" case.

For the MPD region, the baseline scenario was aligned with "Scenario D" from the NB Power IRP, which represents a future with no cost decline for renewables and battery, low BTM generation, low electrification, and moderate-paced technology development.

3.4.4.2 High DER Penetration and Electrification Scenario

The high DER penetration and electrification scenario represents an optimistic growth outlook for DER adoption and electrification, assuming strong policy support and rapid consumer adoption of technologies. In the top-down method, the ISO-NE 90/10 forecast was used to represent higher load from hotter, more humid weather conditions in the summer and colder temperatures in the winter. By the mid-2030s, heating and transportation electrification is expected to cause winter peak demand to become the typical, prevailing peak season.

For the MPD region, the high DER penetration and electrification scenario was aligned with "Scenario A" from the NB Power IRP, which represents a future with decline cost curves for renewables and battery, high BTM generation, high electrification, and rapid-paced technology development.

3.4.5 LOAD FORECASTING AND ALLOCATION METHOD

With the representative timestamps of each snapshot identified, respective values of hourly loads were copied and scaled down for ease of feeder-level allocation and scenario creation using load allocation methods.

Theoretically, there are some load allocation methods commonly used in power system planning:

- **Transformer Capacity-based Allocation:** Subarea/system-level load can be distributed in proportion with transformer capacities provided to serve each feeder. Although it may seem straightforward, this method is unlikely to accurately reflect actual customer usage patterns or time-of-day load profiles.
- **Customer Count Allocations:** Subarea/system-level load can be allocated based on the number and type of customers (e.g., residential, commercial, industrial) to each feeder, typically in conjunction with typical load profiles.

This IGP was developed using a more behaviorally based load allocation strategy, relying on past coincident peak/minimum contribution. The strategy measures each feeder's past actual system peak and minimum timestamps gathered from the data processing step. By examining the historical contribution of each feeder during prior coincident system peaks, their contribution towards system peak and minimum demands was evident. Assuming these contribution ratios remain relatively stable over the long term, they can be used to apportion the next 10-year snapshot values from ISO-NE subarea projections. For example, for the HM4 feeder, the contribution ratio of 2023 summer peak daytime demand to system peak demand is 1.5%. Therefore, its 2024 summer peak day forecast is this ratio multiplied by the ISO-NE BHE system's forecasted load of 291 MW and amounts to a peak of 4.365 MW. The process has been demonstrated in Figure 3-1.

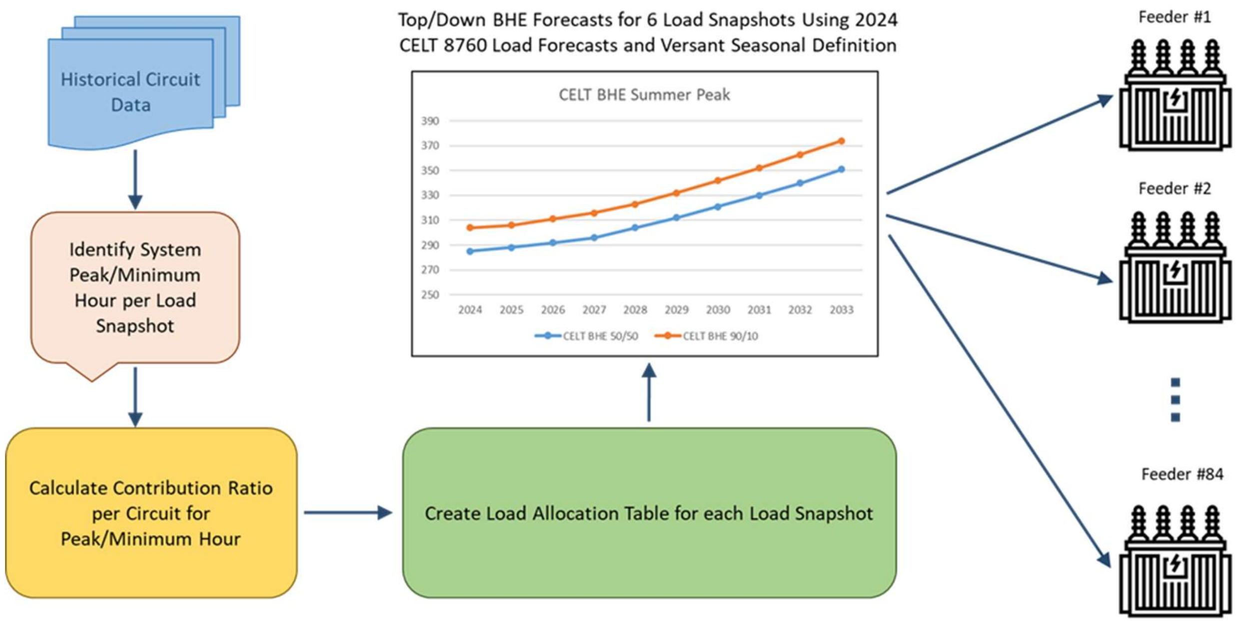

Figure 3-1 - CELT-Based Top-Down Load Allocation Strategy

For the MPD, two key regional planning documents were carefully reviewed to support the development of top-down load forecast—the seven-year NMISA outlook and the 10-year IRP published by NB Power, as described in Section 3.3.2. While both reports provide valuable insights into long-term trends and regional planning assumptions, they do not include granular, time-series forecast data. Instead, they present annual peak and energy projections at an aggregate level. Given this limitation, year-by-year growth rates were calculated based on the reported forecasts in each document. To project top-down results through the forecast horizon, these calculated growth rates were then applied to the historical peak and minimum load of feeders belonging to the MPD system. To perform top-down load forecasting, the calculated year-by-year growth rates were then applied to the six load snapshots for feeders within the MPD system.

3.4.6 TOP-DOWN RESULTS

Based on a top-down load forecasting methodology, the following summarizes key coincident peak and minimum gross forecasts relevant to the Versant BHD system. In short, the Versant BHD system is expected to experience a considerable increase in total load across all seasons and load shapes under both 50/50 and 90/10 weather scenarios. Table 3-3 summarizes the load growth of the forecast snapshots.

TABLE 3-3 - 2024-2033 LOAD GROWTH BY SNAPSHOT					
FORECAST SNAPSHOT	2024	2033 (50/50 CASE)		2033 (90/10 CASE)	
	MW	MW	GROWTH	MW	GROWTH
Winter Evening Peak	301	470	56%	518	74%
Summer Daytime Peak	291	356	22%	379	30%
Summer Evening Peak	280	342	22%	352	26%
Daytime Minimum	143	171	20%	182	27%
Evening Minimum	141	204	45%	217	54%
Spring Minimum	162	236	46%	251	55%
Note: 2033 loads do not reflect connected DERs which will reduce minimum load.					

After summarizing the gross projections, itemized projections were processed, which include heating electrification demand, FTM and BTM solar capacities, and EE reduction. It should be noted that since the itemized projections (i.e., heating electrification, FTM and BTM solar capacity projections) are not available at the subarea level (i.e., BHD), the 2024 CELT Report's projections for the State of Maine were summarized as follows.

2024 CELT projections for heating electrification highlight it as a major contributor to winter peak growth in Maine:

- Winter heating electrification load increases from 39 MW in 2024 to 600 MW in 2033—a 1,438.5% increase.
- Summer impacts from heating electrification remain minimal, growing from 0 MW to 12 MW, primarily due to electrified water heating.

Both FTM and BTM solar capacities are expected to expand considerably in Maine over the forecast period:

- FTM solar capacity is projected to rise from 313 MW in 2023 to 1242 MW in 2033—an increase of 296.8%.
- BTM solar capacity grows from 275 MW in 2023 to 584 MW in 2033, marking an increase of 112.3%.

2024 CELT projects a decline in EE impacts over time:

- Summer EE contribution drops from 100 MW in 2024 to 67 MW in 2033, a 33% decrease.
- Winter EE impacts decline from 100 MW to 71 MW over the same period, representing a 29% reduction.

For Versant's MPD, the two cases lead to different load growth trajectories up to 2034 with different amounts of electrification and DER penetration.

For the baseline scenario, based upon Scenario D of the NB Power IRP, the estimated 2034 winter peak load is marginally lower (approximately 1.9%) compared to the 2023 peak. This small reduction is characteristic of a stable-to-reducing demand scenario, consistent with slower take-up of technology and low rate of economic or population growth assumptions.

On the other hand, the high DER penetration and electrification scenario assumes a more intense penetration of EVs, heat pumps, and other electrified end uses. In this scenario, the winter 2034 peak load is anticipated to be 13% higher than the 2023 peak.

For the remaining load snapshots (e.g., summer peak, spring minimum, daytime minimum, and evening minimum), an annual growth of 0.5% was utilized in the top-down load forecasting, consistent with long-term assumptions of growth provided within the NMISA seven-year outlook. The year-on-year growth rates were utilized to project snapshot values within the forecast period.

3.5 BOTTOM-UP DISTRIBUTION-LEVEL FORECASTING

Starting in September 2024, Versant reviewed the load forecasting task as prescribed by the MPUC with several stakeholder groups, including engineering consultants and ISO-NE engineers. During these discussions, it became clear that the top-down forecasting approach by itself is limited in its ability to accomplish some of the stated purposes of the forecasts or intended objectives of the IGP.

The first challenge is the difficulty of identifying distribution grid needs when using a subarea-level forecast, even when a reasonable load allocation method is applied. The ISO-NE CELT forecast represents a regional system coincident peak, whereas localized non-coincident peaks at each distribution substation/circuit vary and are what is typically used for distribution planning, as shown in the following Figure 3-2.

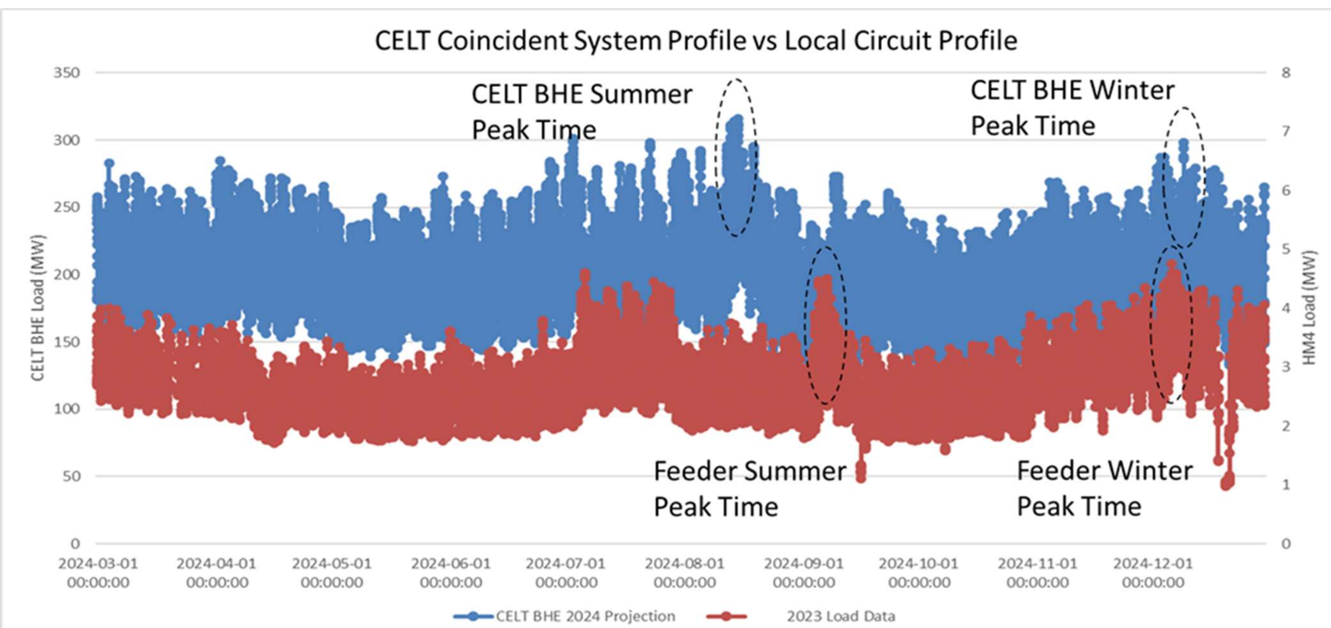

Figure 3-2 – Example CELT Coincident System Profile vs Example Local Circuit Profile

The difference between coincident system peaks and non-coincident circuit peaks can lead to under-/over-allocation of load per feeder under each of the six load snapshots. Without the support of detailed local data sources, including feeder-level load patterns, EV count registration, DER capacity, and population projections, top-down forecast results do not reflect the conditions faced by each feeder.

The second challenge is that the 2024 CELT forecast results do not reflect different scenarios in the growth rates of key technologies, including transportation electrification, heating electrification, BTM solar, and FTM solar. The distinction between the 50/50 and 90/10 load scenarios of the 2024 CELT Report is based solely on weather conditions, not differences in underlying growth trajectories, limiting their ability to inform scenario-based planning at the distribution level.

For these reasons, the bottom-up distribution-level forecasting approach was developed. This method focuses on circuit-level data and serves to ensure that the objectives of the IGP are met. Specifically, it is designed to identify boundary scenarios that stress the system in relation to identified priorities. It promotes climate alignment by incorporating state clean energy and electrification goals, and it advances grid modernization by modeling different DER penetration growth scenarios.

Benefits of the bottom-up method include:

- Provides the ability to focus on localized, non-coincident peaks by using circuit level SCADA data as inputs to the forecasting model;
- Offers precise visibility into local electrification and DER trends using granular historical data;
- Enables comprehensive analysis of various forecasting scenarios (combination of low/med/high growth rates); and
- Provides increased transparency for stakeholders and supports data-driven decision-making for community-focused planning.

3.5.1 STAKEHOLDER ENGAGEMENT

Versant's Milestone 0.5 and 1.0 Meetings were held on November 14, 2024, and February 28, 2025, respectively. Among the primary agenda items for these meetings were detailed discussions of both the top-down and bottom-up forecasting approaches. Versant initially covered the method, design, and data sources required for these forecasts during the Milestone 0.5 meeting.

During the Milestone 0.5 Meeting, the concept of bottom-up load forecasting was first presented to stakeholders, and an explanation was provided as to why Versant believes a bottom-up method is important and necessary for this IGP. The Company discussed the strengths and limitations of top-down versus bottom-up modeling and sought stakeholder feedback to refine forecast inputs and assumptions.

At this point, Versant received stakeholder feedback regarding the time and effort required for the bottom-up load forecasting method, as well as the need for extensive and localized data.

Versant was able to work with EMT to obtain two additional datasets to help inform the bottom-up forecast (additional details are included in Section 3.5.8).

During the Milestone 1.0 Meeting, the bottom-up load forecasting method was comprehensively discussed, and positive feedback was received from stakeholders.

3.5.2 SCENARIO DEVELOPMENT

Unlike the top-down method, which is built with two scenarios, the scenario development for the bottom-up method is much more complex. To reflect the uncertainty of each key variable at the feeder level, a structured set of scenarios was developed by varying key drivers of total load growth, including base load, EV charging load, BTM solar production, FTM solar production, heating electrification load, EE, and weather factors. For each primary variable, zero, low, medium, and high growth trajectories were defined based on available data and policy outlooks, as shown in following Figure 3-3.

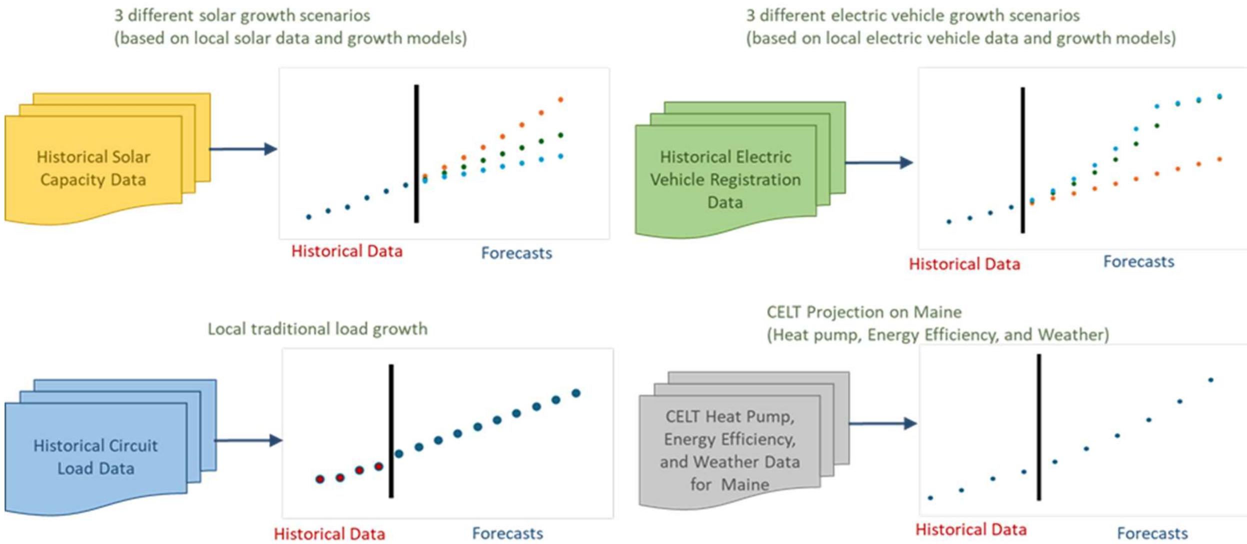

Figure 3-3 - Bottom-Up Scenario Development via Key Factors

Once individual growth rates were established, scenarios were created by systematically combining the low, medium, and high levels across all primary variables. This resulted in a total of 31 distinct scenarios per load snapshot, capturing a broad range of plausible to extreme futures. These 31 scenarios form a confidence band around the bottom-up forecasting method, as illustrated in the following Figure 3-4.

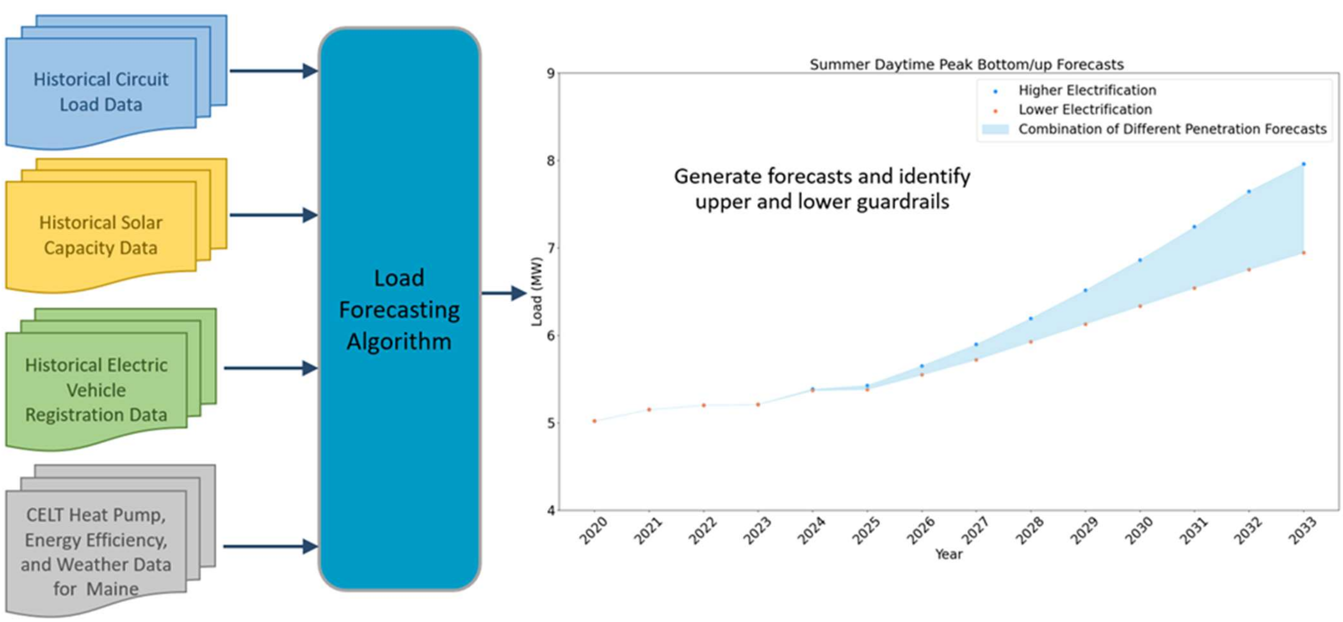

Figure 3-4 – Example Bottom-Up Scenario Development Framework

The range of possible scenarios represents boundary cases, in line with industry accepted best practices, to ensure the grid can operate under varying conditions. It also serves as valuable stress testing for the distribution system. For example, one scenario models a summer daytime peak with high electrification, no DER generation, and uncommon weather conditions, where it is assumed that solar generation is unavailable during the summer daytime peak—e.g., heavy cloud cover, or in the event of a rare occurrence of system-side DER malfunctions. Versant has observed this in both the MPD and BHD regions, and it remains an operational consideration.

Such upper and lower guardrails allow the Company to evaluate feeders under stressed-case conditions and identify potential violations, which can be flagged for further evaluation in later phases. Importantly, this does not imply that the system will be built out to accommodate these extremes but rather supports Versant's ability to pursue a "no-regrets" investment strategy.

3.5.3 WEATHER NORMALIZATION

Part of customer load behavior is directly tied to weather conditions, including air conditioners, space heaters, fans, dehumidifiers, refrigeration loads, etc. Colder-than-normal winters or hotter-than-normal summers can cause increases in demand that are easily seen. For example, according to the National Oceanic and Atmospheric Administration's (NOAA) *National Climate Report*,[33] Maine recorded its hottest summer on record in 2024. Daily departures from normal were as high as +4 °C/ + 7 °F during June to August at the Caribou weather station, resulting in elevated air conditioning use and record-high peak loads.

Without weather normalization, such peaks could be misidentified as structural increases in demand—attributable to economic, demographic, or electrification growth—when, in fact, they are temporary and weather-induced. Therefore, weather normalization is a process that adjusts historical peak load data to what would have happened under normal weather conditions. This normalization helps isolate the underlying trend in demand and enables more accurate estimates of base load growth.

To perform weather normalization, long-term historical regional weather data, specifically daily temperature records, are used to calculate heating degree days (HDD) and cooling degree days (CDD). These two metrics are commonly used to assess energy consumption for heating and cooling, respectively. HDD and CDD are calculated by subtracting the daily average temperature from user-defined reference temperature. If the daily temperature is below a reference temperature, the result represents HDD. Conversely, if the daily temperature is above a reference temperature, the result represents CDD. In this study, the reference temperature is set at 18 °C/ 65 °F.

To understand regional normal weather conditions, the Meteostat bulk data interface was used. This interface provides access to a wide range of datasets, primarily sourced from reliable meteorological organizations, including NOAA and Germany's national meteorological service (DWD). Historical weather data is collected from January 1, 2004, to establish a robust baseline for quantifying normal weather conditions using HDD and CDD. For each feeder, geographical information was used to search for the nearest weather station. The search criteria used were proximity to feeder locations, integrity and quality of long-term data, and preference to primary weather stations (e.g., airports or NOAA sites) with minimal data gaps. Then, 20-year historical averages of seasonal HDDs and CDDs are computed during the 2004-2023 period to quantify the long-term seasonal normal weather conditions. For every year to be utilized in base load forecasting modeling, historical seasonal HDDs and CDDs are compared with the long-term seasonal normal. The results indicate to what extent the temperatures were cooler or hotter in a particular year. The historical load is then adjusted to remove the excess/deficit caused by the abnormal weather conditions using load-weather sensitivity curve. After weather normalization, all historical values for the six snapshots are weather-normalized loads, reflecting demand under seasonally normal weather conditions.

[33] Nat'l Centers for Env't Info., *National Climate Report*: Annual 2024, Nat'l Oceanic & Atmospheric Admin. (Jan. 10, 2024), https://www.ncei.noaa.gov/access/monitoring/monthly-report/national/202413.

3.5.4 BASE LOAD FORECASTING

In an ideal data scenario, base load forecasting models would be built using historical weather-normalized net load data, excluding the impact of EV charging and BTM DER generation. However, due to misalignment in data availability and granularity, particularly between SCADA data (some starting in 2013 and others in 2017), county-level EV records (available only from 2020), and DER project data (most starting in 2020), it is not feasible to accurately reconstruct historical net load for each feeder for forecasting. To address this, a base load forecasting method based on available data sources was designed for this IGP.

First, given the relatively complete FTM DG generation dataset, in-service Level 4 DG output was added back to the raw SCADA data. The FTM DG dataset includes all Level 4 solar projects (i.e., >2 MW) that record generation data at an hourly resolution starting from their in-service date. By restoring FTM generation data to the SCADA net load, the impact of large-scale DG sites was eliminated, and an estimate of gross load was derived that includes base load, EV charging demand, BTM solar generation, heating electrification demand, and EE savings.

Second, using the adjusted gross load and the weather normalization introduced in Section 3.5.3, long-term load forecasting was performed for the six snapshots, as required by the MPUC. To ensure robustness and capture various aspects of load growth behavior, three types of forecasting techniques have been applied, including trend analysis, and multivariable linear regression. Mean Absolute Percentage Error (MAPE) was used as the evaluation metric to identify the most appropriate method for each feeder.

3.5.4.1 Trend Analysis

In this IGP, linear and quadratic trend models have been fitted to identify consistent 10-year trends in the weather-normalized gross load data. The linear model necessitates consistent year-to-year growth, while the quadratic model allows for non-linear trajectories. The trend analysis gives an easily interpretable and comprehensible baseline, especially for feeders with consistent past trends.

3.5.4.2 Multivariable Linear Regression

This approach consists of county population statistics and projections, as introduced in Section 3.3.3, as an explanatory variable, along with a trend. With the correlation of historical gross load to population change and change over time, the model produces an empirically derived projection of the way load could alter with changes in demography and structural variables not directly measured with trend models alone. This method may be particularly beneficial for feeders composed mostly of residential customers.

3.5.4.3 Time-Series Analysis

For feeders with a minimum of 10 years of historical data, an AutoRegressive Integrated Moving Average with Exogenous variables (ARIMAX) model was applied. Unlike regression models or simple trend analysis, ARIMAX is a sophisticated time-series forecasting model that builds in autoregressive, differencing, and moving average terms, as well as external factors like population. In this method, population forecasts were included as an exogenous regressor to enable the model to accommodate internal load pattern autocorrelation and external population effects. Key model parameters—AR, I, and MA terms—were selected based on standard time-series diagnostics, including Akaike Information Criterion (AIC) minimization, autocorrelation plot, and residual analysis. By combining autoregressive structure with an external population driver, ARIMAX generates a more dynamic and responsive forecast, especially in instances where internal load patterns and external growth drives interact in complex manners.

Finally, the estimated 2023 BTM solar generation and EV charging demand was subtracted from the gross load forecast to derive the base load forecast. The subtractions were performed feeder-by-feeder according to the current best estimates of BTM DG generation and EV demand for the base year. More details on the estimation methodologies for BTM solar generation and EV demand in 2023 are provided in Sections 3.5.6 and 3.5.7.

This solution offers a practical approach that accommodates contemporary limitations in data availability and resolution. In other words, the SCADA historic data, EV registration records, and DER interconnection lists are neither spatially nor temporally coherent in a way that allows direct reconstruction of base load. Therefore, the solution approximates base load by taking known and forecast non-base components from the gross load forecast rather than modeling base load forecasting directly from historical net load data.

While this method is reasonable given current limitations, the next IGP could be enhanced by including more granular and longitudinal data on BTM DERs and EV charging, and consistent interconnection records. This would improve base load forecasting and enable better separation of underlying demand patterns from new technologies and customer behavior.

3.5.5 EV DEMAND FORECASTING

In addition to incentive programs offering rebates for EV purchases and charger installations, Maine has a number of state goals and mandates regarding EV adoption, including the 2013 Multi-State Zero-Emission Vehicle MOU (i.e., a goal of 3.3 million EVs on the road by 2025), 2020 Multi-State Medium- and Heavy-Duty Zero Emission Vehicle (i.e., goal that all new medium- and heavy-duty vehicle sales be zero-emission vehicles by 2050, with an interim goal of 30% of new vehicle sales by 2030), and the MWW plan goals of 41,000 light-duty EVs on the road by 2025 and 219,000 by 2030.[34] These programs demonstrate strong potential for transportation electrification in Maine. Therefore, to quantify the impact of EV demand on each feeder over the next 10 years and obtain granular EV counts, EV-related vehicle registration data was allocated to each feeder in Versant's service area. Additional details are provided in the following section.

3.5.5.1 EV Feeder-Level Allocation

As mentioned in Section 3.3.3, historical EV registration data from the Electric Vehicle Population datasets, found in Vehicle Emissions and Greenhouse Gas Data provided by the Maine Department of Environmental Protection, include registration date, ZIP code, and number of registered vehicles by type. Therefore, an EV allocation methodology was developed to estimate EV distribution at the feeder level and to better assess localized impacts on the Versant distribution system. This approach assumes that the number of EVs within a ZIP code is proportional to the number of customers served by each feeder in that zip code. For example, if a ZIP code contained three feeders and Feeder A served 50% of the total customers, Feeder B served 30%, and Feeder C served 20%, then the registered EVs in that ZIP code were distributed accordingly—50% assigned to Feeder A, 30% to Feeder B, and 20% to Feeder C. This ensured that feeders with a higher share of customers were assigned a proportionally larger number of EVs, reflecting the likely distribution of EV adoption. By applying this allocation methodology, EV counts at the feeder level were estimated for the years 2020 to 2024.

3.5.5.2 EV Adoption Forecasting

After estimating historical EV counts at the feeder level, three different EV adoption forecasting models were applied to represent low, medium, and high EV penetration scenarios. These models provide a range of potential future adoption patterns, accounting for different market dynamics, policy influences, and infrastructure developments:

[34] These goals were in effect at the time the IGP commenced in 2024. The most recent goal provided in Maine's Climate Action Plan 2025 is to put 150,000 EVs and plug-in hybrid vehicles (PHEVs) on the road by 2030.

3.5.5.3 Linear Regression Model (Low Growth Scenario)

This model assumes a steady, incremental growth in EV adoption, based on historical trends observed in the 2020-2024 data. It projects future EV penetration using a linear growth pattern, reflecting a scenario where adoption continues at a consistent rate without significant external accelerators such as policy incentives or technological breakthroughs. This approach serves as a conservative baseline for EV adoption forecasting.

3.5.5.4 Exponential Growth Model (Medium Growth Scenario)

The exponential model captures an accelerated adoption trend, assuming that EV growth is driven by factors such as state and federal incentives. This model reflects a scenario where adoption starts gradually but gains momentum over time, aligning with observed market trends in regions experiencing rapid EV uptake.

3.5.5.5 CELT Growth-Rate-Based Model (High Growth Scenario)

As noted by several stakeholders, the 2024 CELT Report's EV adoption forecast, which incorporates multiple state-level electrification goals and policy commitments including the assumptions contained within the MWW plan, is relatively aggressive. In the 2024 CELT Report, ISO-NE aligns Maine's EV adoption forecast with the "Full Electrification" scenario, reflecting high confidence that these ambitious adoption targets will be achieved. Accordingly, EV growth rates from the ISO-NE 2024 CELT Report were used for the high-growth EV scenario. In other words, the high scenario follows ISO-NE's trajectory, assuming rapid and widespread EV adoption, driven by strong policy mandates and continued advancements in EV and charging technologies. One example is shown in Figure 3-5.

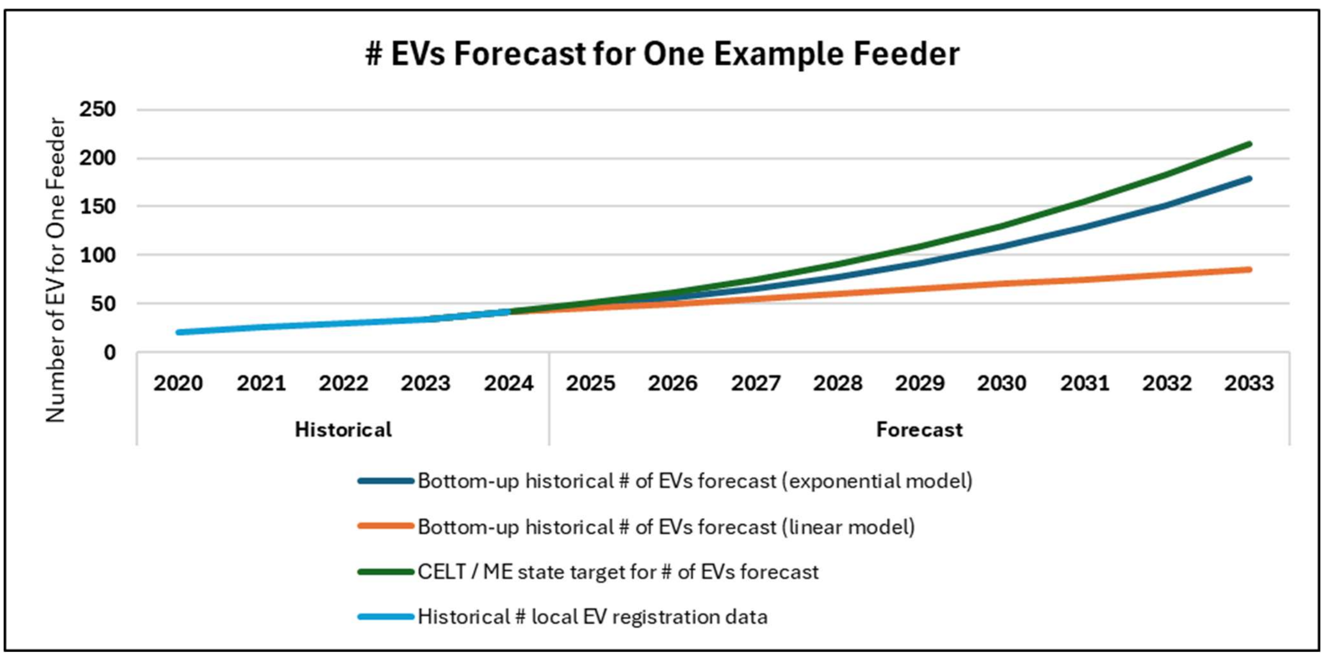

Figure 3-5 - Example of Feeder-level EV Adoption via Three Different Scenarios

3.5.5.6 Population Constraints and Growth Adjustments

To ensure reasonable EV adoption forecasts, town-level population projections (i.e., Section 3.3.3) were used as constraints. Specifically, a household-based adoption cap was applied to prevent unrealistic projections. If the forecasted EV count for a given year exceeded 200% of the estimated household count (i.e., more than two EVs per household), the growth rate was adjusted accordingly. In such cases, the EV adoption trajectory was modified from exponential growth to a slower linear increase or near-flat growth to maintain realism, as shown in the following Figure 3-6.

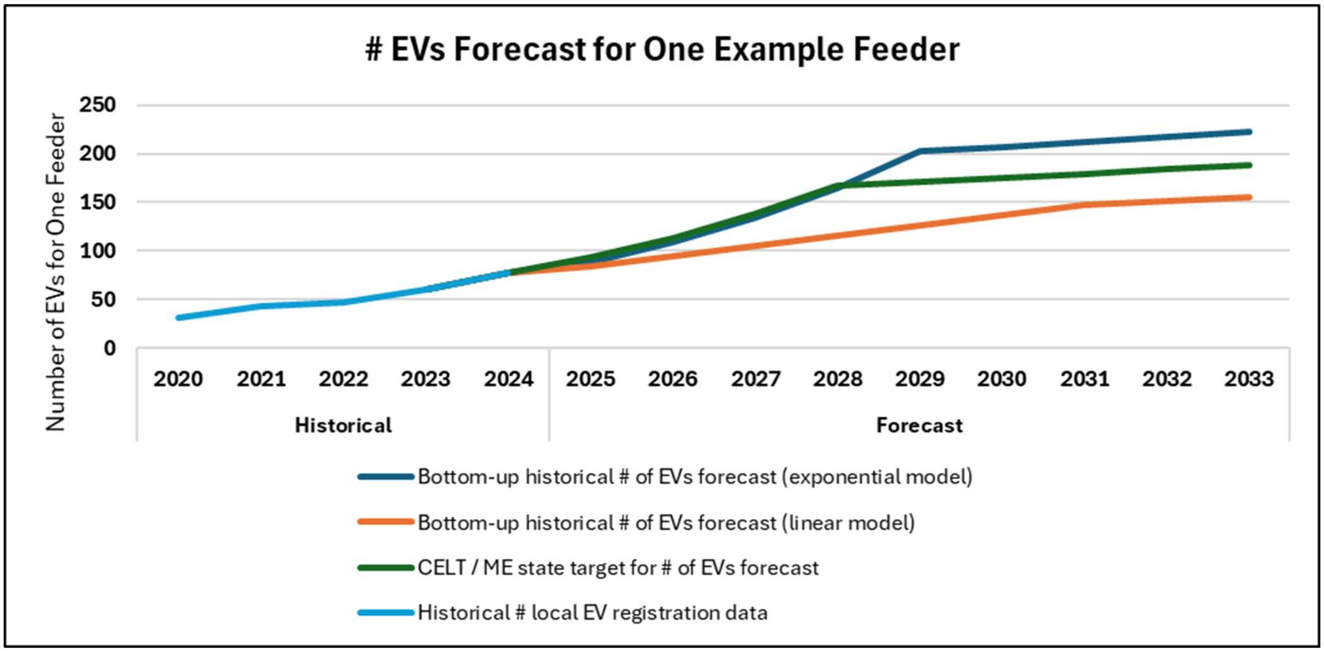

Figure 3-6 - Example of Feeder-level EV Adoption via Three Different Scenarios and Population Cap

3.5.5.7 EV Demand Generation

Following the generation of EV adoption forecasts using three regression models, the National Renewable Energy Laboratory (NREL) Electric Vehicle Infrastructure Projection (EVI-Pro) tool was used to simulate a 24-hour EV demand curve. This advanced tool offers comprehensive capabilities for simulating EV charging behaviors and generating detailed demand profiles based on forecast EV counts and other relevant parameters.

To generate reliable EV demand profiles, data were collected from NOAA regarding local temperatures and from the Federal Highway Administration regarding vehicle usage:

- According to the NOAA dataset, average temperature parameters are set as follows: Summer Evening Peak Snapshot: 68°F; Daytime/Evening/Spring Minimum Snapshot: 50°F; Winter Evening Peak Snapshot: 32°F; Summer Daytime Peak Snapshot: 86°F.
- According to the Federal Highway Administration, each driver in Maine traveled an average of 14,215 miles in 2023, equating to approximately 39 miles per day. Meanwhile, the number of annual vehicle miles traveled in Maine has remained relatively stable since 2007. It is reasonable to assume that this number in 2034 will be similar to 2023.

Based on the configured scenarios and charging behavior models, the EVI-Pro tool generated typical EV charging demand curves for the Versant service territory under six different load snapshots. These demand curves, combined with EV adoption forecasts at the feeder level, provide valuable insights into the timing, duration, and peak demand of EV charging across the system. By analyzing these EV demand forecasts, it is possible to assess how EV charging demand will evolve over the next 10 years for each feeder, helping to identify potential grid impacts, peak load periods, and capacity constraints.

While this analysis uses historical state-level data to select reasonable parameters for EV charging profile modeling, there remains inherent uncertainty in how real-world charging patterns will evolve. In practice, EV charging demand can vary significantly across customer segments and be influenced by factors such as local vehicle ownership trends, pricing structures, and behavioral preferences that are not fully captured in the current EV dataset.

As mentioned in Section 3.1, all scenarios in this study focus on what-if cases and are designed to represent stressed-case conditions. Specifically, while it is recognized that the EV peak charging hour may differ from the system peak hour on certain days or under varying conditions, the analysis focuses on estimating the potential system demand by combining the two peaks under high transportation electrification assumptions.

A comprehensive sensitivity analysis could further illustrate how different parameter assumptions affect the overall load shape. However, due to data limitations and the scope of the current IGP, the best available assumptions consistent with observed state-level trends were applied. Future IGP updates may incorporate improved datasets and expanded sensitivity testing to refine these projections as more empirical EV charging datasets become available.

3.5.6 BTM SOLAR FORECASTING

3.5.6.1 Data Source & Process

In the process of forecasting solar energy generation, PV installations were categorized into two distinct groups: BTM solar and FTM solar. These categories were defined based on the size of the DER projects:

- BTM solar includes all DER projects less than 500 kW, which typically represent residential, commercial, and small-scale industrial installations. These interconnections typically do not have a Versant Point of Interconnection (POI) capable of SCADA measurements.
- Large-scale (Level 4) solar projects typically represent utility-scale or community solar projects. These interconnections typically do have a Versant POI capable of SCADA measurements.

The data used for these forecasts are sourced from a combination of historical DER project lists and a comprehensive DER project queue that includes both active projects and those in the pipeline through 2026 (see section 3.3.4).

3.5.6.2 BTM Solar Capacity Forecasts

Given that most feeder-level BTM solar capacity records exhibit a continuous growth trend, the forecasting process for BTM solar capacity is similar to that for EV adoption. Three different models were used to represent low, medium, and high solar penetration scenarios. These models help to account for varying rates of solar adoption and provide a range of forecasts for the impact of BTM solar on the Versant grid. The models used are as follows:

- **Power Model (High Growth Scenario):** The power model represents the high solar penetration scenario, assuming rapid and widespread growth in solar capacity over time. This model is based on historical installation trends and assumes aggressive adoption driven by strong policy mandates, technology advancements, and increasing public awareness. The power model projects accelerated growth in BTM solar capacity, reflecting an optimistic outlook for solar adoption that assumes significant increases in both residential and commercial solar installations.
- **Linear Model (Medium Growth Scenario):** The linear model represents the medium solar penetration scenario, assuming steady, incremental growth in solar capacity based on historical trends and moderate policy interventions. This model follows a linear growth trajectory, reflecting gradual, ongoing adoption of solar energy due to policy incentives, technology improvements, and increasing public awareness. The linear model projects a more moderate

but sustained rate of adoption, which aligns with forecasts for more widespread integration of BTM solar across various sectors and regions, without assuming overly aggressive growth.

- **CELT-based Model (Low Growth Scenario):** The 2024 CELT forecasts for EV adoption were more aggressive than historical linear and exponential trends, whereas the CELT forecasts for BTM solar adoption were notably conservative. Because of this, the CELT-based model serves as the low-growth scenario for BTM solar, using growth rates taken directly from ISO-NE's 2024 CELT Report. This scenario assumes slower growth in BTM solar capacity, influenced by limited policy support, modest adoption rates, and potential grid constraints. It provides a conservative projection aligned with ISO-NE's more conservative expectations for BTM solar adoption in Maine.

3.5.6.3 Limitations of Historical Trend Modeling

While historical linear and power trend modeling provides a transparent and straightforward approach to BTM solar capacity forecasting, it is inherently limited in its ability to capture emerging changes, particularly in feeders with low BTM solar capacity. For these feeders, historical data often show flat growth, leading the model to forecast minimal changes in the 10-year forecast horizon. This could underestimate future growth potential, especially in areas that would likely see BTM solar adoption increase rapidly. This limitation is one of the motivations to adopt a CELT-based scenario that does not rely on historical trends but instead aligns with 2024 CELT state-level BTM solar projections.

Versant's IGP remains closely aligned with the latest DER interconnection data and future IGP iterations will update the analysis as new solar projects become available. In alignment with IGP objectives and anticipated analytical improvements for the next iteration, multivariable regression could also be used to incorporate additional key solar-related factors—such as land use and rooftop suitability—to more rationally identify potential new solar sites. This approach would support a more forward-looking view of regional solar capacity forecasting, consistent with the IGP's goal of cost-effectively facilitating the accomplishment of Maine's climate and energy goals.

3.5.6.4 BTM Solar Generation Forecasts

Once the BTM solar capacity forecasts are obtained for the high, medium, and low growth scenarios, the next step is to estimate the solar generation for each feeder. This is done by applying the capacity forecasts to a typical solar capacity factor profile that reflects the regional solar generation patterns for Versant's feeders.

To create the typical solar profile, the hourly average capacity factor was computed for each feeder using historical solar generation data and site capacity spanning the past three years. This hourly averaging captures the typical daily shape of solar output while accounting for seasonal and day-to-day variations.

Next, the historical peak capacity factor was identified for each feeder to scale the average profile. For example, consider a hypothetical case (does not represent real data): a 5 MW solar site may exhibit an average midday capacity factor of 0.7, while historical data indicate occasional hourly peaks reaching 0.95. To capture this potential peak, the hourly average capacity factor profile is normalized by multiplying each hour by the ratio (i.e., 0.95/0.7 = 1.36) of the historical peak to the average peak. This method preserves the typical daily solar profile while reflecting the maximum solar generation observed, providing a more representative and robust profile than only using the capacity factor from a single peak solar generation day

3.5.7 LARGE-SCALE DISTRIBUTION SOLAR FORECASTING

Large-scale DER installations have grown rapidly in recent years, though the pace varies significantly across circuits. This surge is largely driven by earlier policies, financial incentives, and targeted programs that encouraged development.

Forecasting large-scale solar introduces unique challenges compared with BTM solar and EV adoption. The primary issue is the limited availability of feeder-level historical data, most of which have only been collected within the past five years. Large-scale DER projects do not tend to follow steady, incremental growth patterns on individual feeders. Additionally, large-scale DER projects, due to their size, may face hosting capacity constraints. Typically, only a few large projects can be interconnected on a single feeder. As a result, most feeders have seen just one large-scale installation in the past five years, though Versant has observed up to three on a single feeder.

Despite this apparent sparsity, these projects represent the largest capacity additions and exert the most significant impacts on system performance (see Section 3). This concentration of capacity complicates forecasting because traditional regression-based models rely on repeated observations over time—data that are unavailable when development occurs through a small number of high-impact events.

3.5.7.1 Large-scale Solar Forecasting and Allocation:

To overcome these challenges, system-wide large-scale solar capacity forecasting was conducted, using three different models to represent varying levels of FTM solar penetration: a linear model (high scenario), a CELT-based model (mid scenario), and a logarithmic model (low scenario), as shown in the following Figure 3-7.

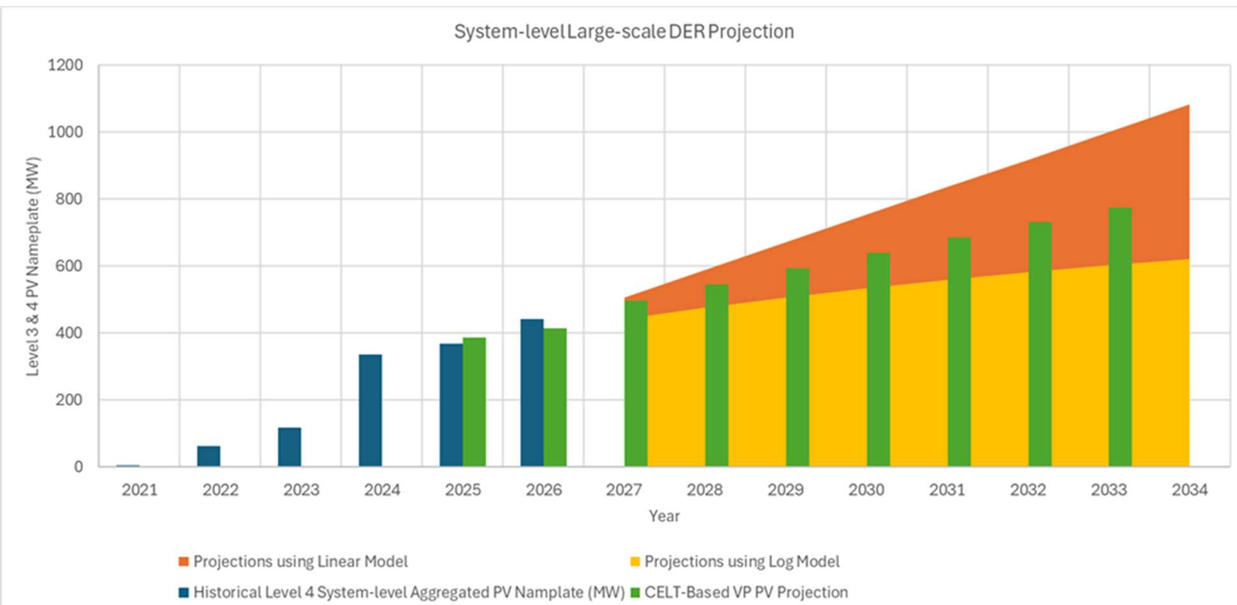

Figure 3-7 - System-Level Large-Scale DER Projection via Three Different Scenarios

For each year, the forecasting process begins by calculating the new large-scale solar capacity based on the three different system-wide forecasting models: linear, CELT-based, and logarithmic scenarios. These models provide estimates for overall capacity at the system level, which is then allocated to individual feeders.

3.5.7.2 The Benefits of Location

Any feeders with zero hosting capacity were excluded, as these feeders are unsuitable for the addition of new large-scale DER projects absent significant and costly upgrades. It should be noted that hosting capacity estimates are based on current network data and assumptions; actual limits may vary due to future operational changes, equipment upgrades, or unforeseen constraints. Only feeders with sufficient hosting capacity were considered for further allocation in this study.

Once suitable feeders are identified, the load-generation (load-gen) ratio was calculated for each feeder using the 2026 total solar capacity and corresponding load data. This metric assumes that historical load patterns and generation profiles are representative of future conditions, which may not capture all potential variability in demand or DER output.

The load-gen ratio serves as a key metric that reflects the balance between load demand and generation as well as locational benefits of aligning new solar resources with existing load. Feeders with higher load-gen ratios are typically better positioned to integrate additional solar without causing operational issues such as reverse power flow or voltage violations. However, these projections are indicative and do not guarantee that operational constraints will not arise under extreme conditions or in combination with other grid events.

Based on the combined assessment of hosting capacity, load-gen ratio, and inherent locational advantages, the top candidate feeders that were best suited to accommodate new large-scale solar projects were identified. These selections are expected to maximize system value while minimizing integration challenges and supporting long-term grid planning goals. These selections represent an analytical prioritization rather than a definitive recommendation, and future project deployment may consider additional operational, regulatory, or economic factors.

After selecting the top candidate feeders, both the hosting capacity and the load-gen ratio were updated to reflect the new capacity being added. This update assumes that the integration of each project occurs as planned and does not account for unexpected delays or changes in conditions. This step ensures that the grid's ability to accommodate future projects is accurately represented.

This process was then repeated for each subsequent year, with the updated hosting capacity and load-gen ratios used to identify the top candidates for new installations. While this iterative process helps balance large-scale solar deployment with the grid's capacity, it is important to recognize that these projections are scenario-based and do not capture all potential operational uncertainties and regulatory changes.

3.5.7.3 Heating Electrification and Energy Efficiency Forecasting

Unlike EVs and DGs, where there is access to limited zip-code/feeder level datasets (see Section 3.5.5 and 3.5.6), no localized datasets were available for heat pump demand and EE savings at the beginning of this IGP development process. Given this data limitation, a CELT-based approach was adopted based on the 2024 CELT forecast as the primary reference. This methodology follows the 2024 CELT's state itemized load forecasts and growth trends in both heating electrification and EE. Specifically, the contribution of these two variables was initially calculated to the gross load. For example, the 2024 CELT Report indicates the heating electrification load of Maine in 2024 winter will be 39 MW, representing 1.97% of the traditional winter peak load (i.e., 1,980 MW). Similarly, EE savings ratios were established using 2024 CELT's Maine EE saving projections. Once established, these ratios were consistently applied to feeders, with the assumption being that each feeder will have an equivalent proportional impact. This facilitated the estimation of heating electrification load and EE savings at the feeder level over the next 10 years, with relative contributions scaled based on observed 2024 impacts and adjusted to align with the shifting baseline forecast.

3.5.8 EMT DATA

In the EMT EV dataset, a total of 1,684 EVs (i.e., BEV + HEV + PHEV) were identified in Versant's service territory. However, according to the Maine vehicle emissions and GHG data, there were 52,754 EVs (i.e., BEV+HEV+PHEV) statewide as of 2024. This substantial difference indicates that the available EMT dataset may not be exhaustive, and relying solely on this dataset could lead to an underestimation of the actual EV population within Versant's service area. Given this observation, state records and the designed EV allocation approach, as mentioned in Section 3.5.5, have been used to estimate feeder-level EV demand impacts in this IGP.

Recognizing the value of having a more granular, location-specific dataset, Versant intends to continue to collaborate with EMT to access the best possible localized EV dataset(s). Such data may be used in the next IGP to better measure the localized impact of EV charging on distribution load forecasting.

The EMT-provided heat pump (HP) data offer details of installed HP units from 2015 to 2025 based on participation in the EMT rebate program. As of the latest dataset, a total of 47,646 HP units were accounted for across Versant's service territory in 2025, with notable growth in recent years. Over 66% of the total installations occurred between 2020 and 2025. Across the service territory, the number of HP units per feeder varied widely. The median number of units per feeder was over 140, with the highest observed at 1,382 units. A small number of feeders had few installations, with fewer than 10 units each, highlighting variability in the distribution of HP adoption.

Due to timing constraints concerning when in the modeling process these data became available, this dataset was not directly used in distribution feeder load forecasting. However, a sensitivity analysis was conducted to understand how the CELT-based HP load forecasts perform compared with forecasts from the EMT HP dataset. To conduct this sensitivity analysis, Versant used the same growth patterns used in EV adoption forecasts and the EMT-delineated curve that presents average power usage of metered units as a function of ambient air temperatures to roughly forecast the HP demand per feeder in the next 10 years.

This study illustrated that while CELT-based projections underestimate actual near-term effects (especially in 2025), they are more optimistic than the EMT-based projections for the majority of the feeders by 2033 (especially in winter peak snapshot). This trend shows that while CELT assumptions trail actual current adoption in the near term, they meet or exceed longer-term expectations on average across the system. The EMT dataset has been valuable, and Versant anticipates utilizing it more widely in the next IGP where it may enhance spatial and temporal precision.

3.5.9 WEATHER FACTOR

The bottom-up load forecasting approach incorporates the three weather scenarios defined in the 2024 CELT Report, including 10/90, 50/50, and 90/10 weather conditions, which represent milder-than-normal weather, typical weather, and warmer/colder-than-normal weather conditions. These scenarios help characterize the relationship between weather and distribution system load to create particularly stressful cases.

To reflect weather-related demand sensitivity in the bottom-up forecast, Versant leveraged ISO-NE's published state-level peak demand forecasts under each of the three weather scenarios. Using the 50/50 weather scenario as the baseline, the relative changes under the 10/90 and 90/10 weather scenarios were calculated as follows:

- The percentage difference between the 10/90 and 50/50 ISO-NE 2024 CELT forecasts is used to estimate the load reduction associated with mild weather conditions.
- The percentage difference between the 90/10 and 50/50 ISO-NE 2024 CELT forecasts is used to quantify the load increase associated with less likely but more weather-sensitive conditions.

These percentage values are applied as weather adjustment factors to the bottom-up forecast to create particularly stressed case, such as "summer daytime peak with high electrification, no DER generation, and 90/10 weather conditions" and "daytime minimum load with low electrification, high DER generation, and 10/90 weather conditions."

3.5.10 BOTTOM-UP RESULT SUMMARY

The bottom-up method considers localized conditions and assumptions to provide different growth trajectories at the feeder level. As a result, growth rates vary significantly across feeders. As described in Section 3.2.2, the bottom-up forecast method resulted in the analysis of 31 different scenarios per snapshot per feeder. To highlight key results and maintain clarity, key statistical metrics are presented across all feeders under the upper guardrail scenario (i.e., high transportation electrification growth scenario and low DER growth scenario) for the three peak snapshots and the lower guardrail scenario (i.e., low transportation electrification growth scenario and high DER growth scenario) for the three minimum load snapshots. This allows the Company to illustrate the range of bottom-up results while focusing on representative boundary cases that are used in distribution modeling and analysis. More details can be found in Section 3.5.2.

3.5.10.1 Summer Daytime Peak Snapshot

- For gross load 10-year total growth (i.e., 2024-2033), the lowest and highest feeder-level growth rates are 3.07% and 99.67%, respectively, with an average 10-year growth of 26.53%. At the system level, the aggregated non-coincident summer daytime peak (feeder peaks) increases from 419 MW to 514 MW, representing a 22.53% total growth.
- Under the high transportation electrification growth scenario, the number of EVs across the Versant service territory increases from approximately 11,400 in 2024 to 56,800 in 2033, representing 395% growth. Correspondingly, system-wide EV charging demand is estimated to reach 66.91 MW in 2033. Given the statewide target of 150,000 EVs on the road by 2030, as outlined in the 2024 MWW updated plan, the EV adoption forecast appears reasonable and consistent with the State goal.
- Under the low DER growth scenario, the capacity of BTM DERs across the Versant service territory increases from 16.95 MW in 2024 to 36.7 MW in 2033, representing 116% growth. The capacity of FTM DERs increases from 388.85 MW in 2024 to 520.62 MW, representing 33.89% growth.
- For heating electrification 10-year total growth (i.e., 2024-2033), system-wide heating electrification load starts near zero in 2024 and increases to approximately 2 MW by 2033. Even with this growth, its contribution to summer peak snapshots remains minimal, as heat pump demand is largely driven by winter weather.

3.5.10.2 Summer Evening Peak Snapshot

- For gross load 10-year total growth (i.e., 2024-2033), the lowest and highest feeder-level growth rates are 1.71% and 72.36%, respectively, with an average 10-year growth of 23.75%. At the system level, the aggregated non-coincident summer evening peak increases from 333 MW to 399 MW, representing 19.88% total growth.
- In the summer evening peak snapshot, DER generation is considered to be 0 MW. Versant anticipates that DER output during the summer evening peak (between 8 PM and 11 PM) will be near zero.
- The same scenarios for transportation electrification growth and heating electrification are applied as in the summer daytime peak snapshot. However, because the snapshot represents a different hour of the day, the actual EV charging demand and DER generation levels differ—even though the underlying growth patterns remain the same. In 2033, system-wide EV charging and heating demands are estimated to reach 39.54 MW and 1.83 MW, respectively.

3.5.10.3 Winter Evening Peak Snapshot

- For gross load 10-year total growth (i.e., 2024-2033), the lowest and highest feeder-level growth rates are 36.29% and 128%, respectively, with an average 10-year growth of 61.9%. At the system level, the aggregated non-coincident winter evening peak increases from 359 MW to 567 MW, representing 57.71 % total growth.
- In the winter evening peak snapshot (4 PM to 7 PM), DER generation is considered to be 0 MW, as explained for the Summer Evening Peak.
- The same scenarios for transportation electrification growth and DER adoption are applied as in the summer daytime peak snapshot. In 2033, system-wide EV charging demand is estimated to reach 69.25 MW.

- For heating electrification 10-year total growth (i.e., 2024-2033), system-wide heating electrification load starts around 6.8 MW in 2024 and increases to 106.9 MW by 2033, representing 1468.6% total growth. This significant growth is a key driver behind the projected shift in system peak from summer to winter.

For three peak snapshots, the system-level key forecasting results are summarized in Table **3-4**. It should be noted that total EV demand is listed under the high EV growth scenario in this table. Meanwhile, no DER generation was assumed for the summer and evening peak snapshots, due to the evening hours occurring from 8 PM to 11 PM.

TABLE 3-4 – PEAK LOAD SNAPSHOT SUMMARY

SNAPSHOT	SYSTEM GROSS LOAD GROWTH	2033 GROSS LOAD	2033 SYSTEM EV DEMAND	2033 SYSTEM HEATING DEMAND
Summer Daytime Peak	22.53%	514 MW	66.91 MW	2 MW
Summer Evening Peak	19.88%	399 MW	39.54 MW	1.83 MW
Winter Evening Peak	57.71%	567 MW	69.25 MW	106.9 MW

3.5.10.4 Daytime Minimum Load Snapshot

- Under the low transportation electrification growth scenario, the number of EVs across the Versant service territory increases from approximately 11,400 in 2024 to 24,100 in 2033, representing 110.52% growth. The difference between high and low transportation electrification growth scenarios is 32,700 EVs, which reflects the uncertainty of EV development in the local area.
- Under the high DER growth scenario, the capacity of BTM DERs across the Versant service territory increases from 16.95 MW in 2024 to 56.84 MW in 2033, representing 235.4% growth. The capacity of FTM DERs increases from 388.85 MW in 2024 to 892.58 MW, representing 129.55% growth. The main distinction between the high and low DER growth scenarios is whether the surge in large-scale solar project development, which began after 2023, can be sustained beyond 2026.
- For heating electrification 10-year total growth (i.e., 2024-2033), system-wide heating electrification load starts near zero in 2024 and increases to approximately 0.6 MW by 2033, which reflects limited portions of heating demand occurring during daytime hours.

3.5.10.5 Evening Minimum Load Snapshot

- In the evening minimum load snapshot, DER generation (solar PV) is considered to be 0 MW.
- The same scenarios for transportation electrification growth and DER adoption are applied as in the daytime minimum snapshot. However, because the snapshot represents a different hour of the day, the actual EV charging demand and DER generation levels differ—even though the underlying growth patterns remain the same.
- For heating electrification 10-year total growth (i.e., 2024-2033), system-wide heating electrification load starts at 2.1 MW in 2024 and increases to approximately 33.4 MW by 2033.

3.5.10.6 Spring Minimum Load Snapshot

- The same scenarios for transportation electrification growth and DER adoption are applied as in the daytime minimum snapshot. However, because the snapshot represents a different hour of the day, the actual EV charging demand and DER generation levels differ—even though the underlying growth patterns remain the same.
- For heating electrification 10-year total growth (i.e., 2024-2033), system-wide heating electrification load starts at 2.7 MW in 2024 and increases to approximately 43.26 MW by 2033. This growth reflects the fact that most spring minimum load hours occur in the late afternoon or evening, coinciding with higher heating demand.

For the three minimum snapshots, the system-level key forecasting results are summarized in the following Table **3**-**5**. It should be noted that total DER capacity is listed under the high DER growth scenario in this table.

TABLE 3-5 – MINIMUM LOAD SNAPSHOT SUMMARY

SNAPSHOT	SYSTEM BASE LOAD GROWTH	2033 BASE LOAD	2033 SYSTEM DER CAPACITY	2033 SYSTEM HEATING DEMAND
Daytime Minimum	6.97%	123 MW	949 MW	0.6 MW
Evening Minimum	6.93%	114.7 MW	949 MW	33.4 MW
Spring Minimum	6.48%	148.7 MW	949 MW	43.26 MW

Detailed feeder-level results are provided in Appendix B.

3.5.11 COMPARISON OF BOTTOM-UP AND TOP-DOWN LOAD FORECASTING RESULTS

The designed bottom-up and top-down methods rely on different data sources and fundamentally different modeling frameworks, which leads to considerable differences in feeder-level results, as demonstrated in section 3.4 and 3.5. Bottom-up results reflect localized trends, feeder-level peak, and minimum load, while the results of the top-down approach follow regional growth patterns and feeder loads during system peak and minimum hours. The combined visibility is critical for ensuring that the Versant distribution grid can operate safely and reliably in the next 10 years, as it allows planners to identify potential no-regrets investment opportunity and better align infrastructure and operational strategies with both Versant and state-wide demand patterns.

Despite these differences, both methods produced similar conclusions at the system-wide level. For the three peak load snapshots, both methods forecast significant growth in the winter evening peak snapshot over the next 10 years, with system-wide gross load increasing by more than 50% due to the development of transportation and heating electrification.

Both methods also indicate that the system peak will shift from summer to winter within the coming years, consistent with observations that winter peak demand has already been increasing steadily in Versant service territory.

For the two summer peak snapshots, both methods estimate system-wide load growth of approximately 20-30%.

For the three minimum load snapshots, the bottom-up method shows slower growth compared to the top-down method. However, the bottom-up method builds in more stressed scenarios, including higher negative load flow from BTM and FTM DGs expected to expand over the next decade.

4. SYSTEM MODELING AND NEED IDENTIFICATION

4.1 DISTRIBUTION SYSTEM MODELING

The core principle of system planning is to ensure electric distribution systems can safely, reliably, and cost-effectively deliver power to customers, now and in the future, while adapting to changes in demand, technology, climate change, and policy.

Future-ready planning keeps Versant's grid safe, reliable, and compliant as demand and technology change.

As customers add new loads, it is critical that Versant's electricity system continues to maintain compliance with established planning criteria that govern the power quality, capacity standards, reliability, and safety of the grid.

The IGP aligns with minimum service quality standards established under MPUC Chapter 320 rules and 35-A M.R.S. § 301[35] by ensuring that distribution system planning supports the delivery of safe, adequate, and reliable service to all customers. Chapter 320 requires utilities to develop and maintain comprehensive planning processes that identify system needs and ensure transparent, equitable investment decisions. The IGP directly supports this by using data-driven methodologies, such as system modeling, load and DER forecasting, and stakeholder engagement, to proactively address reliability, capacity, and resilience challenges. Additionally, 35-A M.R.S. § 301 mandates that utilities provide service that is "safe, reasonable, and adequate," a standard that the IGP addresses by incorporating stressed-case scenario analyses, climate resilience planning, and strategies for integrating emerging technologies such as DERs. By aligning with these regulatory requirements, Versant's IGP effort ensures that its long-term planning efforts are both compliant and responsive to customer and system needs.

The system needs assessment incorporates results of the Climate Vulnerability Study, as well as the requirements of 38 M.R.S. § 576-A, which sets GHG reduction goals for the State of Maine to achieve 100% clean energy by 2040, by taking state renewable growth projections into consideration through inclusion in DER growth forecasts.

4.1.1 LOAD CONSIDERATIONS

Versant incorporated both forecast load growth and anticipated DER deployment into its system models. This includes accounting for increased electricity demand from electrification, such as EVs and heat pumps, as well as variable generation from rooftop solar, battery storage, and other DERs. These forecasts are integrated into load flow models to assess impacts on equipment loading, voltage profiles, and system reliability under both normal and stressed-case conditions.

By modeling these future scenarios, the utility can identify potential violations of thermal limits or voltage deviations before they occur, enabling proactive upgrades or non-traditional solutions to maintain safe, reliable, and efficient service.

Versant used two forecasts for building the distribution models. These forecasts represented the full range of stress, or boundary conditions, that the system could experience over the study period. The forecasts were: (1) peak load with electrification; and (2) minimum load with full DER output. Using boundary cases ensures that the distribution system can accommodate the electrification and DER growth that support the State's climate goals while ensuring reliable electric service for Versant's customers.

[35] C.M.R. 65-407-320 § 4.

4.1.2 DER CONSIDERATIONS

Although the forecast distributes the allocation of forecasted DERs up to the station and feeder level, exactly where projects will ultimately be located is subject to customer and developer choices. Versant's experience shows that DERs may be interconnected throughout the distribution system, and within customer premises BTM. Since it is not possible to predict where individual DERs will be interconnected over the study period, the Company made simplifying assumptions to evenly distribute aggregated DERs at substations or at three fixed points along distribution feeders. The fixed points were: (1) at the head of the feeder near the substation (close); (2) mid-feeder (middle); and (3) at the end of the feeder. This approach captures varying electrical impacts that DERs can have depending on where they may be deployed in the future. These impacts can include line and equipment loading, such as voltage rise or reverse power flow, which can be more pronounced at the end of a feeder. This method also helps identify overloads, voltage problems, and hosting capacity issues, ensuring that the forecasting and modeling process proactively addresses potential constraints and maintains compliance with distribution planning criteria. DER additions are incorporated into Versant's models based on the forecast in-service year. Small DER projects were distributed evenly at selected locations throughout the system for each of the forecasts. Large DER projects were allocated as one project per year (up to 3 MW) and were connected by cycling through the three representative locations to diversify their impacts.

4.1.3 CLIMATE RESILIENCE CONSIDERATIONS

During the development of Versant's system planning models, the Company looked for cases where IGP and climate drivers might coincide to create grid needs that would not have occurred with IGP drivers alone. However, it was found that the two types of drivers were largely distinct given that climate change drivers will likely not be significant until after the 10-year IGP analysis period. Versant's Climate Change Resilience Plan identified potential areas where modification of design standards for transmission, distribution, and substation infrastructure could enhance climate resilience. Future engineering and design details for IGP solutions would incorporate those standards' modifications.

4.1.4 DISTRIBUTION SYSTEM MODELING

Versant identified distribution needs using CYME software. Each CYME model contained the substation of study, along with the distribution feeders emanating from that substation. The substation models were updated to incorporate the 10-year peak and minimum DER and loading forecasts.

Power flow simulations were performed each year of the 10-year forecast to identify the planning criteria violations at the point when they first occur.

4.2 DISTRIBUTION NEEDS ASSESSMENT

All substations in Versant's system were analyzed with peak load and minimum load forecasts over a 10-year period.

Versant identified a system need for any of the following violations, based on the Company's planning criteria:

- A substation transformer's load exceeding 90% of its top rating.
- The power through a distribution device[36] exceeds 90% of its rating.
- The load on a distribution conductor exceeds 90% of its rating.

[36] Distribution devices include, but are not limited to, regulators, circuit breakers, reclosers, and fuses. The ratings of these devices are typically determined by the current carrying capacity.

- The voltage at any point on a distribution feeder or device exceeds Versant's operating voltage criteria.[37]

The IGP process spanned 18 months, beginning in July 2024. Versant analyzed the system using a 10-year planning horizon (2024-2033). Violations identified for 2024 and 2025 reflect the analysis period and may not represent current system conditions. In some cases, Versant has already flagged these issues through other programs and may have projects underway to address them. Where load growth is minimal, Versant closely monitors system conditions to determine the optimal timing for future projects.

4.2.1 SUBSTATION TRANSFORMER OVERLOAD ASSESSMENT

Figure 4-1 and Figure 4-2 show the number of transformer overloads each year during peak and minimum load conditions respectively. The violations shown for 2024 and 2025 are planning criteria violations resulting from the IGP grid needs assessment. These violations may not reflect the conditions that Versant has observed on its system during peak and minimum load periods.

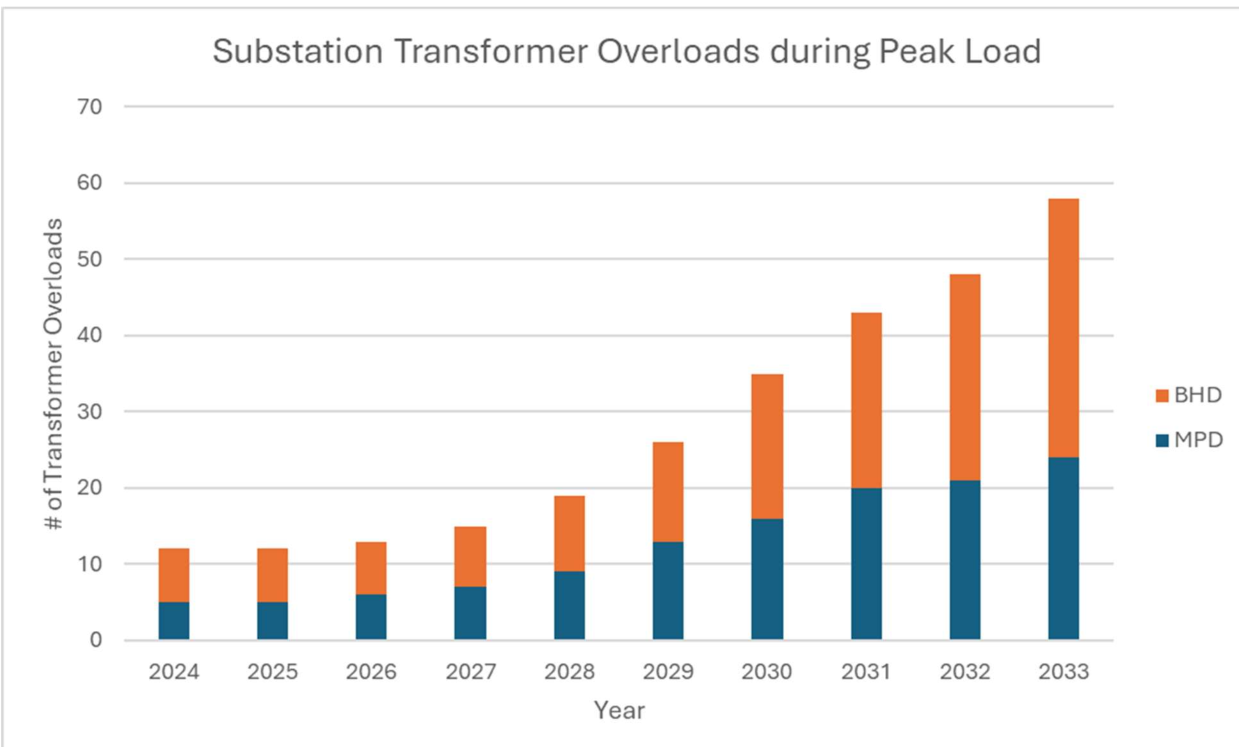

Figure 4-1 - Substation Transformer Overloads During Peak Load

[37] Versant's planning criteria specifies that the distribution system must maintain ±5% of nominal voltage. This is consistent with state service quality standards as defined in Chapter 320.

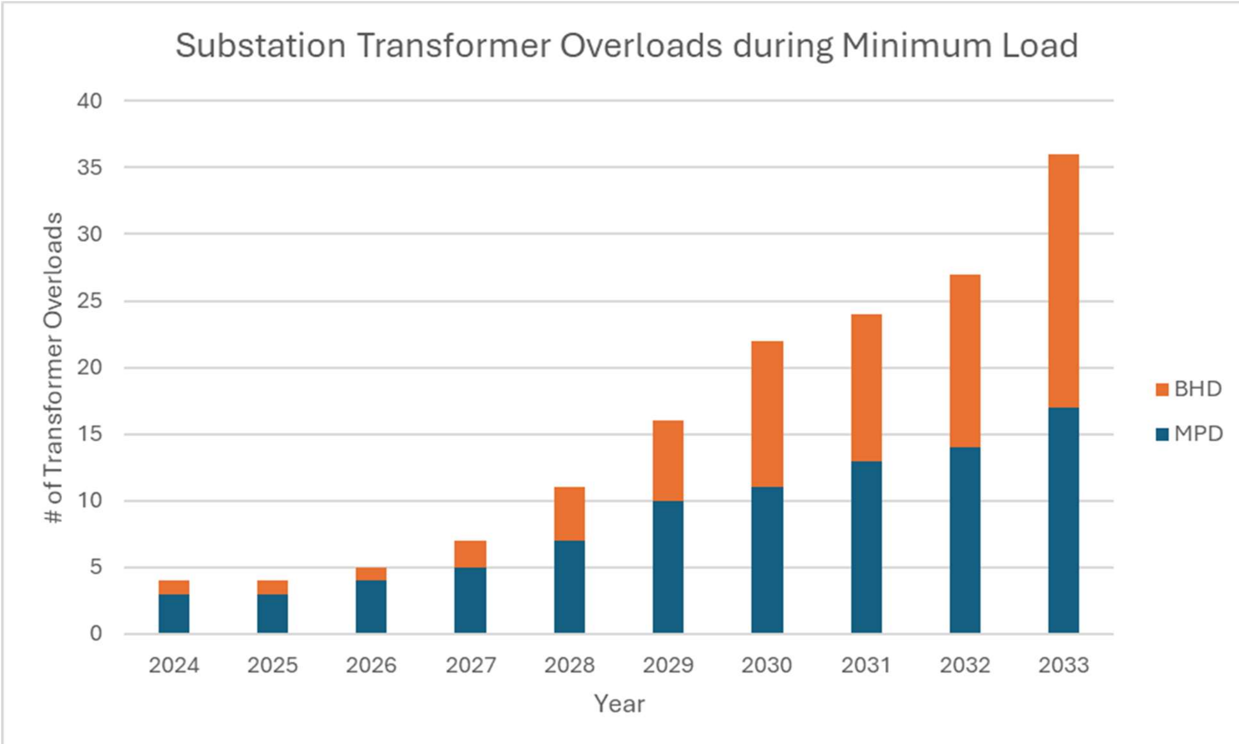

Figure 4-2 - Substation Transformer Overloads During Minimum Load

Most projected peak load violations occur in the BHD region, where 32% of transformers are expected to be overloaded compared with 22% in the MPD. BHD also faces more voltage violations due to rapid load growth. Across both regions, 18 substations are projected to overload under peak conditions from electrification and under minimum loading due to reverse power flows from DER adoption.

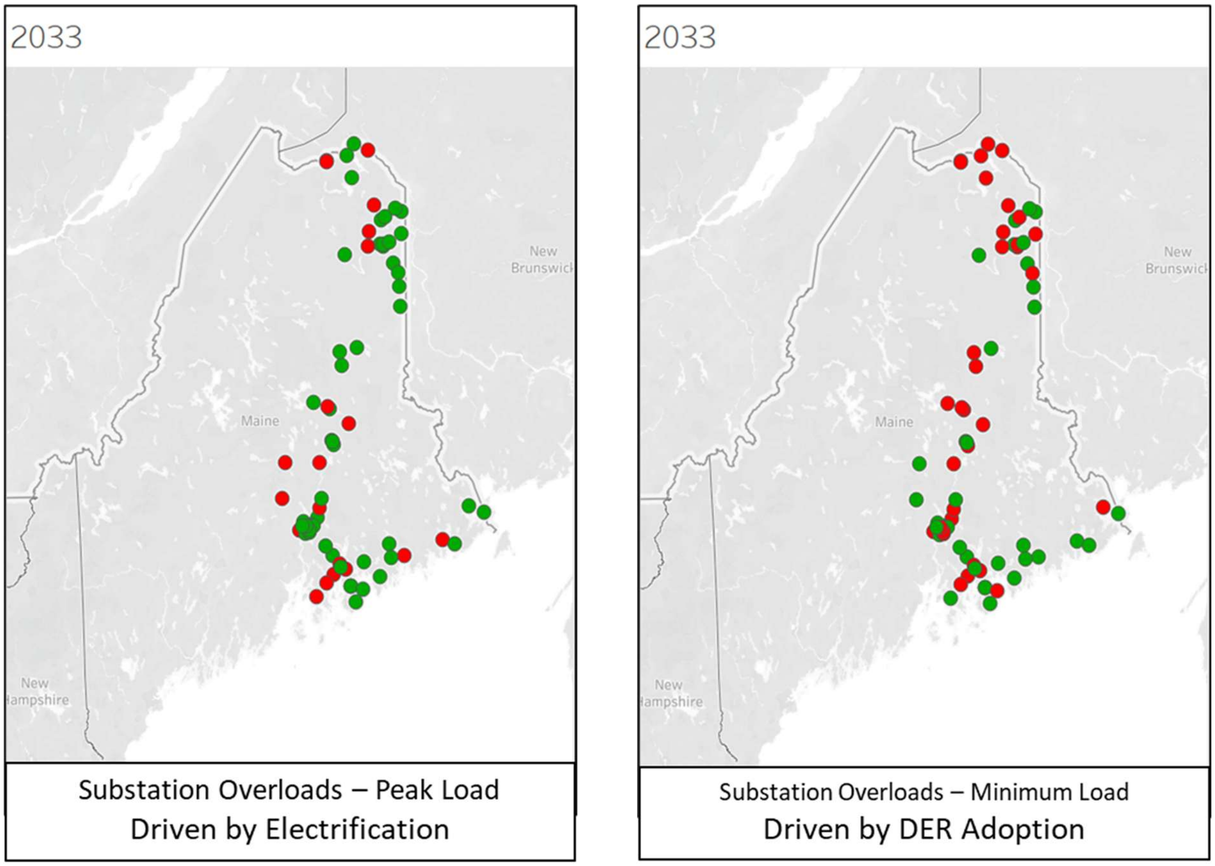

Figure 4-3 - Substation Overload Comparison

It is also important to note that a transformer that is overloaded under peak load might not be overloaded during minimum load/high DER, and vice versa.

As DER forecasts reveal minimum load violations, it is presumed that generators will be responsible for those system needs upgrades once they are identified during the application and study process. Therefore, only system needs identified during peak loading are to be resolved in the solution.

4.2.2 DISTRIBUTION DEVICE OVERLOAD ASSESSMENT

Figure 4-4 and Figure 4-5 show the number of distribution device overloads (e.g., switches, reclosers, and fuses) each year during peak and minimum load conditions respectively.

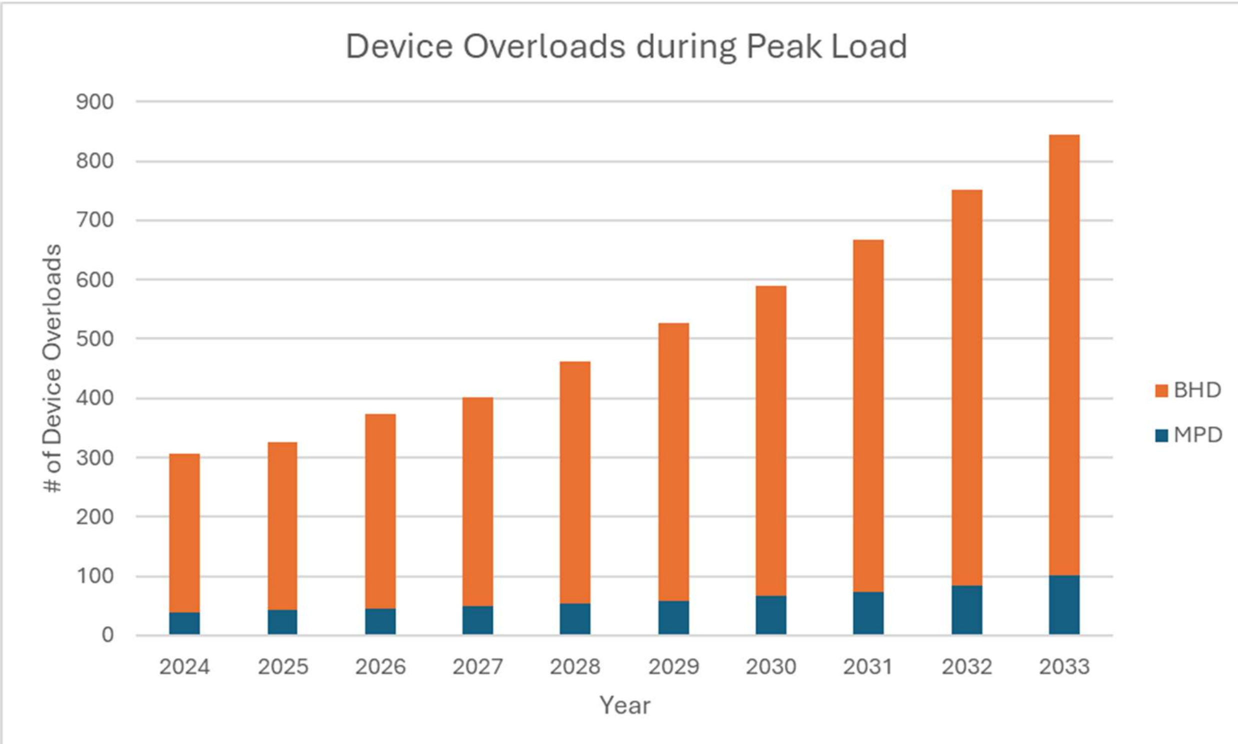

Figure 4-4 - Distribution Device Overloads During Peak Load

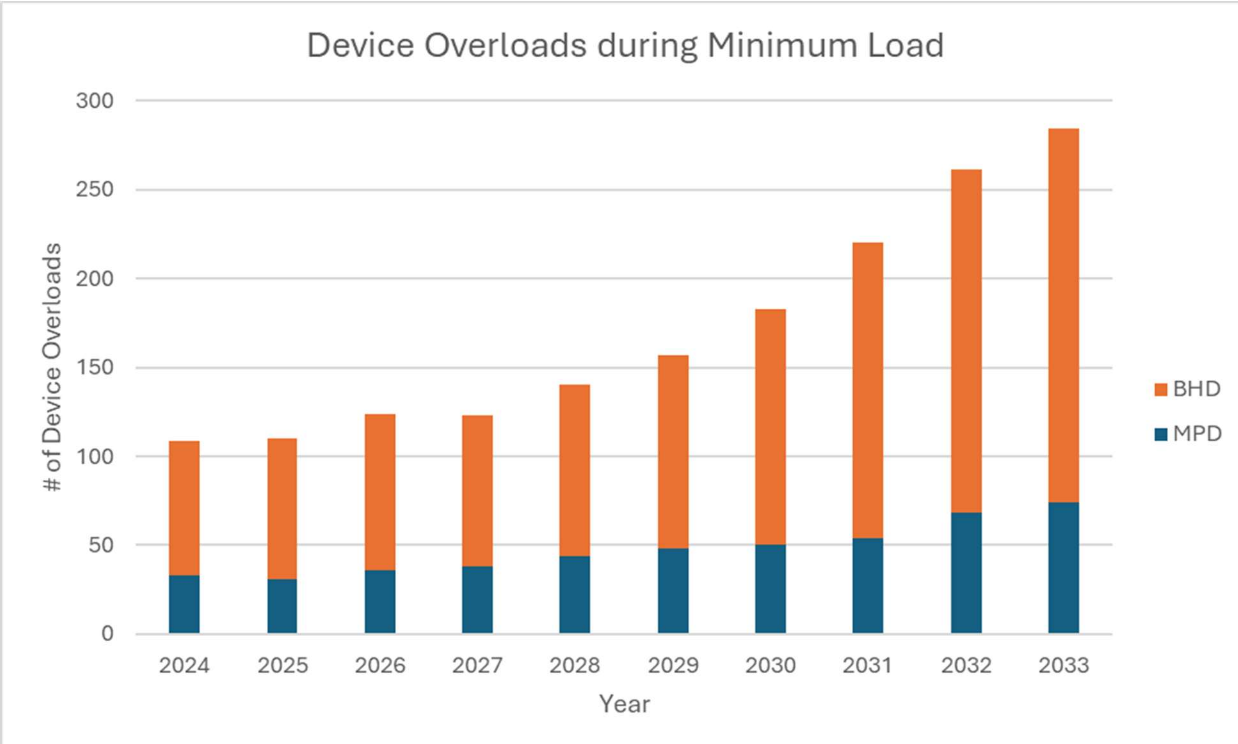

Figure 4-5 - Distribution Device Overloads During Minimum Load

Distribution equipment devices are more significantly affected by load growth during peak loading conditions, as 845 devices are overloaded during peak versus 284 during minimum loading conditions in the 2033 forecasts.

Peak load affects the BHD more significantly as there are 744 devices overloaded versus 101 in the MPD.

4.2.3 DISTRIBUTION CONDUCTOR OVERLOAD ASSESSMENT

Figure 4-6 and Figure 4-7 show the length (in miles) of conductor thermal overloads each year during peak and minimum load conditions respectively.

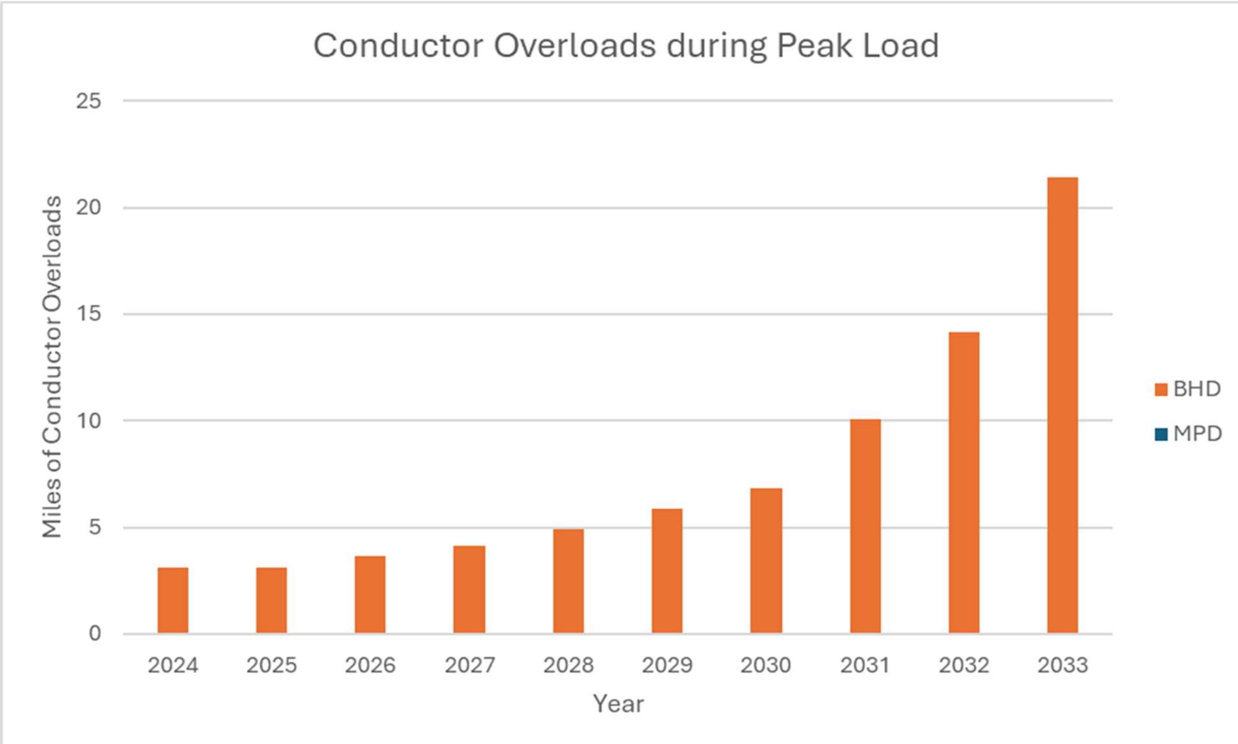

Figure 4-6 - Distribution Conductor Overloads During Peak Load

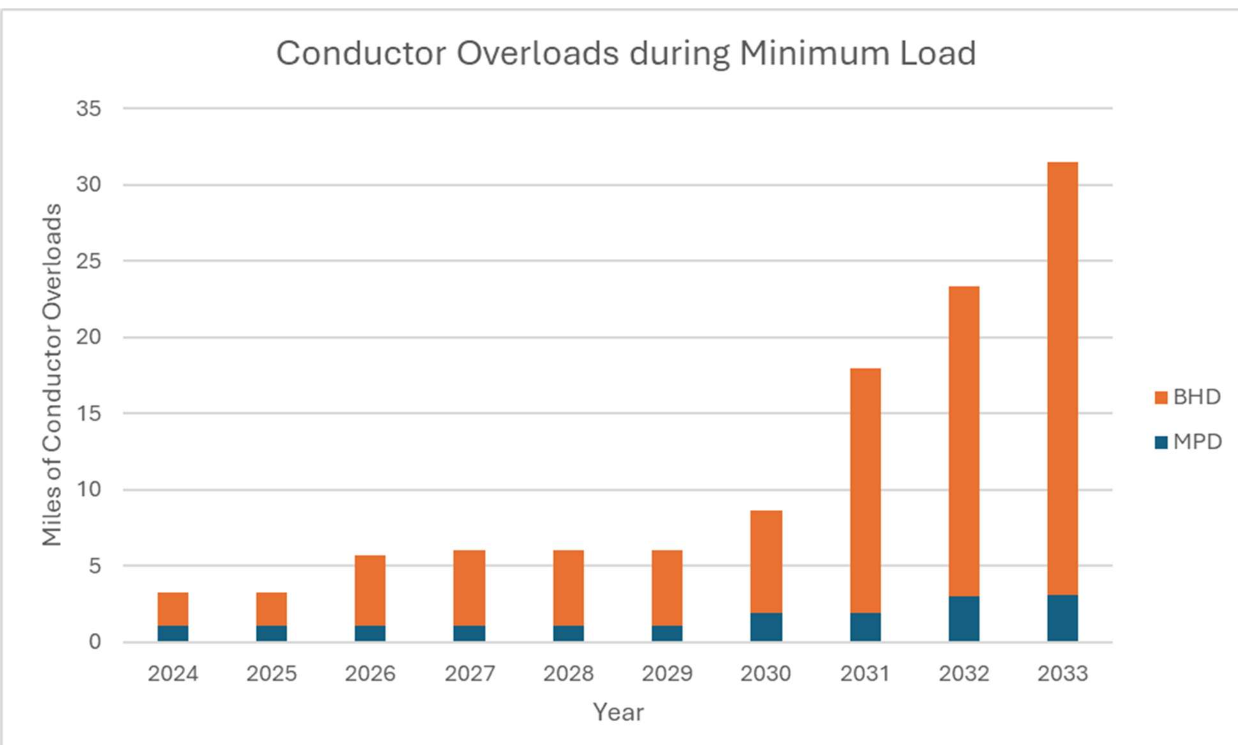

Figure 4-7 - Distribution Conductor Overloads During Minimum Load

The forecasts result in relatively minor impacts to conductor overloading—21 miles of line overloads during peak loading conditions and 32 miles during minimum loading conditions—with most of the violations occurring in the BHD.

4.2.4 DISTRIBUTION VOLTAGE VIOLATIONS ASSESSMENT

Figure 4-8 and Figure 4-9 show the length of voltage violations each year during peak and minimum load conditions respectively.

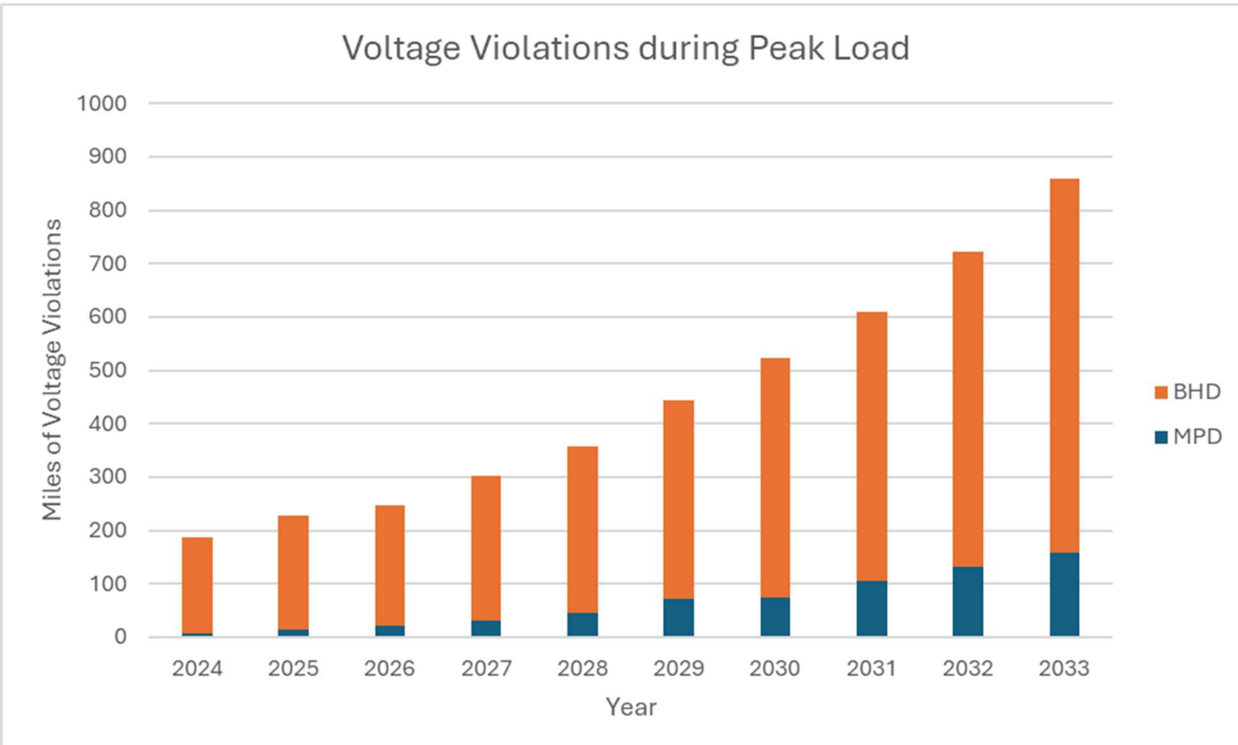

Figure 4-8 - Voltage Violations During Peak Load

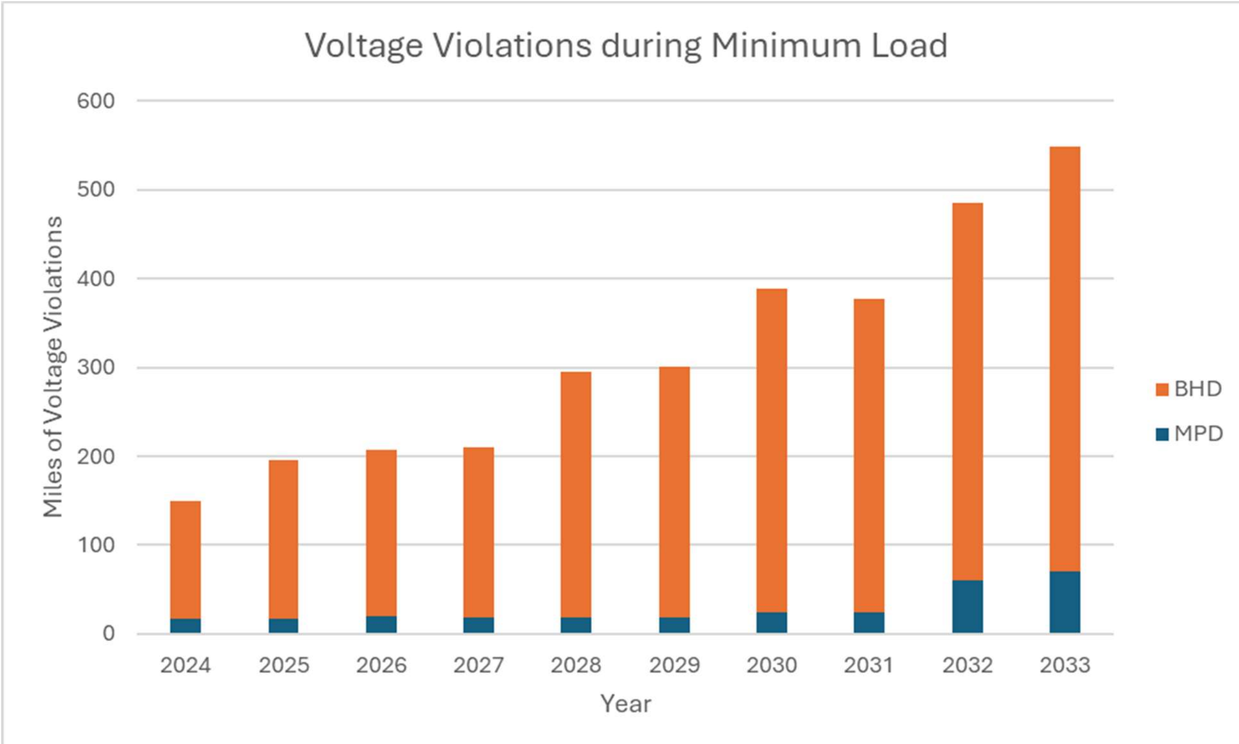

Figure 4-9 - Voltage Violations During Minimum Load

Significant portions of Versant's distribution system are projected to experience voltage violations. This is due in part to the geographical complexity of the distribution networks, which contain long single-phase sections serving rural customers.

Ten percent of the distribution system saw voltage violations during peak loading conditions and 7% during minimum loading conditions.

4.3 DISTRIBUTION TIME-SERIES ANALYSIS

Versant recognizes that the electric grid is transitioning from a system historically planned around a limited number of static peak and minimum operating conditions to one increasingly shaped by time-dependent drivers, including beneficial electrification, intermittent DERs, weather variability, and evolving customer choices. Stakeholders and the MPUC have emphasized the importance of improving data quality, enhancing time-series analysis, and strengthening the ability of utility planning practices to reflect these dynamics.

Although Versant has used components of time-series planning within its planning and engineering processes for some time, the Company acknowledges that a transition to more comprehensive time-series planning may be valuable. Such a change requires coordinated progress across data availability, analytical tools, workforce readiness, and planning processes, all while ensuring the significant resources required would provide meaningful benefits.

Below, Versant outlines a roadmap the Company could use to incrementally expand its use of time-series analysis in planning activities over the 10-year IGP horizon, with the long-term objective of enabling full 8,760-hour time-series forecasting and power flow analysis capabilities across the distribution system where meaningful benefits can be realized. To enhance data availability, Versant has made meaningful progress in deployment of AMI and data analytics which can be leveraged for time-series analysis.

The first phase of implementation revolves around identifying system areas and circuits that would benefit the most from time-series analysis. Once circuits with accurate 8,760-hour forecasts are determined, the number of pilot circuits can be further refined based on areas with high DER penetration, rapid electrification, and locations with planning criteria violations identified during static analysis. In this early phase of adoption, time-series analysis can be used to verify system violations first identified during static analysis and can also inform planners of the frequency and duration of thermal and voltage violations, helping to further refine mitigation solutions.

In conjunction with the effort to identify pilot test areas of the distribution system, Versant staff likely require training on developing 8,760-hour load and DER profiles, formatting profiles for CymDIST analysis, and interpreting simulation results. Staff can then compare results of the pilot time series analyses with existing analysis and planning methods. Versant will also need to plan for accommodating software licenses, as CymDIST users cannot simultaneously share the Long-Term Dynamics or Load Flow with Profiles modules.

The second phase of implementation is to standardize department-wide practices and analysis criteria for use in other areas of Versant distribution system planning. At this point, staff will be fully trained, and all system areas will have sufficient historical data to develop baseline 8760 profiles for load and DERs. At this phase, Versant will be able to develop internal tools to convert historical data into multiple forecast scenarios to account for variables such as weather and electrification.

The third and final phase of time-series adoption will allow for interdepartmental uses. For example, future IGPs and DER integration will be able to use results of recent time-series analyses. This could further enable programs such as flexible DER interconnections.

Versant views the continued evaluation and transition toward expanded time-series planning as an emerging and essential technology, strengthening long-term investment in planning and grid readiness. This roadmap reflects a balanced approach—one that acknowledges current limitations, aligns with stakeholder and Commission priorities, and establishes a credible path toward evaluation and expanded 8,760-hour planning capability over the IGP horizon. Versant aims to strengthen planning outcomes while optimizing its resources efficiently.

Versant performed time-series analysis on two circuits to analyze the system's performance over a time horizon considering variations in the following:

- Load demand;
- DER penetration; and
- Other system conditions (i.e., transformer and regulator tap changes and capacitor bank switching).

The time series analysis was performed in CymDIST, with a year-long, hour-by-hour simulation (i.e., an 8760 analysis).

The two substations tested were Costigan and East Corinth. Costigan was selected since minimal violations were found in the steady-state analysis portion of the IGP. East Corinth was selected since several violations were found in the same analysis.

Overall, the findings of the time series analysis are in line with the needs assessments, validating those results. For the Costigan substation, the only violation identified in the steady-state analysis was a minor area of undervoltage, reaching as low as 113.4V in 2033. The time-series analysis found the lowest undervoltage to be 113.8V and only lasting for a total of two hours during 2033. Both analyses indicate a minor violation that does not need to be resolved in the upcoming capital plan.

For the East Corinth substation, the most severe violation is a thermal overload for a single-phase regulator on the EC1 feeder. The steady-state analysis determined that this violation occurred in 2024, and the device was loaded to 214% of its rating.

The time-series analysis showed that this regulator overloaded at 250 instances over the year 2033 for a total of 2,258 hours, roughly 25% of the year. Both analyses indicate a severe violation which requires the same solution to mitigate.

Versant conducted these time-series analyses in part to better understand the necessity and feasibility of expanding use in future iterations of the IGP, including the resources and costs that would be necessary. This decision is aligned with the MPUC Order's directive that the utilities "include a narrative and a proposed roadmap, identifying the near-term actions and investments, timeframes and costs needed to make this shift to time series analysis."[38]

[38] MPUC Order at 21.

TABLE 4-1 – EAST CORINTH TIME SERIES ANALYSIS								
EQUIPMENT DETAILS			STEADY-STATE		TIME-SERIES			
Feeder ID	Equipment Type	ID	Loading % in 2033	1st Year Overloaded	Highest loading (%)	Overload count	Longest overload time (hours)	Total overload time (hours)
EC1	Sectionalizer	EC1-11LMR	181.5	2025	160.2	239	13	1,391
EC1	Recloser	EC1-12LR	139.2	2029	150.0	196	12	867
EC1	Switch	EC1-2	-	-	100.8	1	1	1
EC1	Regulator	EC1-VR-3LMR	187.3	2026	172.5	275	14	1,740
EC1	Regulator	EC1-VR-5	213.5	2024	184.9	250	16	2,258
EC2	Recloser	EC2-12LMR	125.9	2030	130.8	150	6	197
EC2	Sectionalizer	EC2-13LMR	119.3	2031	125.9	49	6	79
EC2	Recloser	EC2-16LR	110.8	2032	110.1	2	4	8
EC2	Regulator	EC2-VR-2M	106.7	2032	110.6	2	4	8
EC2	Regulator	EC2-VR-2R	156.2	2025	164.8	178	14	894

TABLE 4-2 – COSTIGAN TIME SERIES ANALYSIS						
EQUIPMENT DETAILS		STEADY-STATE		TIME-SERIES		
Feeder ID	Location	Lowest Voltage (V)	1st Year of Violation	Lowest under-voltage (V)	Under-voltage count	Total under-voltage time (hours)
CC1	100583174	113.4	2033	114	1	2

4.4 TRANSMISSION SYSTEM MODELING

Versant maintains separate models for the MPD and BHD transmission systems, and the Company applied forecast data to each transmission model independently for analyzing transmission grid needs.

Each transmission model was updated with 10-year forecast data for electrification load growth and DER output. These forecasts were integrated into PSS/E load flow models to evaluate equipment loading and voltage performance under normal and contingency conditions using PowerGem TARA software tool, in accordance with NERC TPL-001-5 and Versant transmission planning criteria.

Similar to distribution system modeling, two scenarios were studied: peak load with low DER and minimum load with high DER, to capture stressed-case conditions. This analysis helps identify potential deficiencies such as overloaded lines or transformers, voltage violations, and load losses exceeding 25 MW. By stress-testing the system, Versant ensures that transmission needs are based on robust conditions, providing confidence that facilities will continue to operate safely and reliably as load and DER penetration increase. Network upgrades also were reflected in models to represent the most current equipment capacities.

A set of steady state contingency analyses were performed for MPD and BHD for the two scenarios to identify any system criteria violations which would require mitigation action based on considered planning criteria.

4.5 TRANSMISSION NEEDS ASSESSMENT

Versant conducted transmission analyses in the MPD and BHD systems to identify planning criteria violations (grid needs). These violations include:

- A thermal overload on a transmission line or substation transformer where load exceeds 100% of the rating;
- A thermal overload on a distribution substation transformer where load exceeds 100% of the rating;
- A bus voltage violation where voltage exceeds ±/-5% of nominal voltage; and
- A post-contingency load loss greater than 25 MW.

4.5.1 MPD NEEDS ASSESSMENT

The MPD analysis involved more than 35 transmission system buses and approximately 40 transmission lines and transformers. Overall, ~10% to 30% of the MPD transmission system exhibited potential transmission planning criteria violations under the peak load and minimum load scenarios. A steady state voltage stability analysis revealed that the MPD system can accommodate an approximate 7.5% increase above the load and DER forecast without causing local voltage issues. Table 4-3 summarizes the transmission planning criteria violations identified for MPD.

TABLE 4-3 – MPD CRITERIA VIOLATION SUMMARY		
VIOLATION TYPE	PEAK LOAD	MIN LOAD / MAX DER
Thermal overloads – transmission lines or substation transformers	None	One
Thermal overloads – distribution substation transformers	None	Nine
Bus voltage violations	Three violations on three different buses	27 violations on 11 different buses
Loss of load violations	None	None

Versant expects that the potential criteria violations encountered during peak load and minimum load output could be resolved with adjustment of transformer settings and operational reconfiguration. These actions would improve the voltage profile across the MPD without the need for capital upgrades.

4.5.2 BHD NEEDS ASSESSMENT

The BHD system includes over 79 substations and 81 transmission lines. Overall, approximately 10% to 30% of the BHD transmission system exhibited potential transmission planning criteria violations under the peak load and minimum load scenarios. Table 4-4 summarizes the transmission planning criteria violations identified for BHD.

TABLE 4-4 – BHD CRITERIA VIOLATION SUMMARY		
VIOLATION TYPE	PEAK LOAD	MIN LOAD / MAX DER
Thermal overloads – transmission lines or substation transformers	36	11
Thermal overloads – distribution transformers	11	Four
Bus voltage violations	683 violations on 136 different buses	162 violations on 50 different buses
Loss of load violations		

Versant's BHD 345/115 kV transmission system feeds a primarily radial subtransmission system operated at 44 kV. The addition of beneficial electrification load during system peaks, and higher DER output during minimum load contribute to voltage regulation challenges as the load and DER output fluctuate. This is exacerbated by loss of load following contingencies.

Peak load scenario

- IGP load growth from EV charging and heat pumps adds stress to the network due to insufficient voltage support toward the remote ends of radial lines. This can cause low-voltage violations.
- Some lines and transformers experience thermal overload under these conditions.

Minimum load (Maximum DER output) scenario

- Lower demand increases voltage, and DER output increases voltage further, particularly if the DER is interconnected toward the remote end of a radial line.
- This scenario can cause high-voltage violations without adequate reactive power support and voltage regulation capability, particularly on smaller radial lines.

Versant has considered operational solutions, such as adjusting transformer settings, and network reconfiguration to resolve violations where possible. As electrification load and DER output increase, capital upgrades will be needed to increase system capacity and meet voltage criteria. These solutions are discussed in Section 5.7.

Additionally, Versant observed several contingencies which resulted in load loss exceeding 25 MW in the peak and minimum load forecast scenarios. The load loss risk is addressed in the solutions proposal and considers switching actions, topology changes, and network upgrades to mitigate the risk. Also, steady state voltage stability analysis revealed that load can be increased by between 14% and 30% depending on which final solution is pursued.

5. SOLUTIONS IDENTIFICATION AND EVALUATION

5.1 SOLUTION METHODOLOGY

Each system need is identified in the needs assessment portion of the IGP. Versant's approach was to objectively evaluate potential traditional and non-traditional solutions for targeted grid needs and select the least-cost option capable of addressing a grid need over the 10-year IGP planning horizon while best maintaining alignment with other stated IGP priorities.

The IGP evaluates multiple alternatives to identify no-regrets solutions to address future grid needs.

5.2 TARGETING

Because of the relatively large number of overall system needs identified based on the forecast, Versant developed a method for targeting the most pressing projected needs for which confidence was high that solutions would be necessary in the short- to medium-term. This process has enabled Versant to identify strategic system investments that deliver the greatest overall benefit.

To do so, system needs were analyzed using three key metrics which identified the most critical system upgrades:

- **Schedule:** When does the violation occur? Near-to-mid-term violations may be most urgent to resolve.
- **Severity:** How severe is the violation? The severity is assessed based on how much:
  - the equipment is overloaded thermally (i.e., high ≥ 125%, medium = 110%-124%); or
  - how far the voltage has dropped from an acceptable level (i.e., high <104 V, medium = 105-110V).
- **Consequence:** How many customers are affected by the violation? A customer count of more than 500 results in higher consequence vs. less than 100 customers affected results in lower consequence scores. A higher customer count provided higher confidence in the violation, as projected impact to larger numbers of customers indicates a stronger likelihood of, e.g., an area experiencing increased electrification/load growth.

Each of the identified system needs were screened using this metric, and the needs deemed most pressing due to their schedule, severity and/or consequence were targeted for individualized scorecard evaluations.

Remaining violations will continue to be monitored and evaluated, including in future iterations of the IGP. While individualized scorecards were not developed for each non-targeted grid need, Versant did produce illustrative scorecards by violation type which will aid the Company, regulators and stakeholders in evaluating potential future solutions.

5.3 SCORECARDS

Versant developed scorecards based on the template provided by the MPUC. This template provides guidelines for assessing potential solutions against key metrics such as cost, technical performance, policy alignment, and environmental impact.

To improve transparency and gather stakeholder feedback, Versant facilitated a detailed discussion regarding solutions evaluations during its Milestone 2.5 Meeting in August 2025. Versant incorporated feedback from the meeting into the information presented in scorecards.

As directed by the MPUC Order, Versant evaluated various potential solutions by grouping results into relative bands (high, medium, low) across the scorecard's categories. This approach enabled Versant to effectively evaluate results while avoiding false precision sometimes associated with numerically weighted scores, especially for long-term forecast-based modeling, as discussed by certain stakeholders during the MPUC IGP priorities-development process.

The results of these scorecards will support and inform Versant's holistic planning processes as well as provide a framework for implementation timing and capital allocation. At the point at which the Company elects to move forward with a solution to an IGP-identified need, Versant will conduct additional detailed analyses such as project engineering, scoping, timing, and assessing NWAs where applicable. Scorecards are also likely to bring additional transparency to future cost recovery proceedings, allowing additional visibility into how and why certain solutions were selected.

Description of System Need:		*[1-3 sentences summarizing need]*			
	Evaluation Category	**Comparative Assessment Scorecard**			
		Alternative A	Alternative B	Alternative C	Alternative D
Cost	Capital costs	*[low, medium, or high impact]*			
	Operations & maintenance costs				
	Avoided costs				
Technical Performance	Efficacy				
	Execution and schedule risk				
	Existing infrastructure optimization				
	Reliability & resiliency impact				
	Flexible management of customers' load and generation				
EJ	Equity				
	Emissions impact				
	Local environmental impact				
Policy Alignment	Peak load reduction				
	Electrification readiness				
	DER and renewables integration				
	Advances state energy and climate goals				
	Overall prioritization ranking	*[1st, 2nd, 3rd, 4th]*			
Scorecard Narrative:		*[longer text describing scoring process & results, with any necessary supporting data]*			

Figure 5-1 - Scorecard Template provided by the MPUC

5.3.1 COSTS

The first section of the scorecard evaluates the cost implications for implementing a proposed solution. The cost is broken down into three evaluation categories—capital costs, operations and maintenance (O&M) costs, and avoided costs. The definition and scorecard assessment philosophy for each are shown in Table 5-1.

TABLE 5-1 – COST EVALUATION CATEGORIES				
EVALUATION CATEGORY	DEFINITIONS	COMPARATIVE ASSESSMENT SCORECARD		
		Most Preferred	Middle	Least Preferred
Capital costs	What is the cost to implement the proposed solution?	Low minimal utility investment	Medium moderate utility investment	High major capital investment
O&M costs	How much O&M does the proposed solution require?	Low minimal ongoing maintenance costs	Medium Some recurring maintenance costs	High Requires regular maintenance costs
Avoided costs	What costs can be avoided down the line by implementing the proposed solution?	High Significant cost savings opportunities	Medium Some deferral value or operational efficiency	Low Limited/no meaningful deferral

5.3.2 TECHNICAL PERFORMANCE

This section of the scorecard aims to evaluate how effective the proposed solutions are to mitigate system violations. The following evaluation categories are utilized to determine technical performance score: (1) efficacy; (2) execution and schedule risk; (3) existing infrastructure optimization; (4) reliability and resilience impact; and (5) flexible management of customers' load and generation. Evaluation categories are provided in Table 5-2.

TABLE 5-2 – TECHNICAL PERFORMANCE EVALUATION CATEGORIES

EVALUATION CATEGORY	DEFINITIONS	COMPARATIVE ASSESSMENT SCORECARD		
		Most Preferred	Middle	Least Preferred
Efficacy	How well does the proposed solution allow system operation within thermal and voltage limits?	High Fully resolves the system need over multiple years	Medium Relatively effective for resolving violations over multiple years	Low Limited ability to consistently resolve need over multiple years
Execution and schedule risk	What execution and schedule risks can be expected from the proposed solution?	Low Mature technology, straightforward construction and lead times	Medium Moderate complexity and dependency on permitting, procurement, etc.	High Long lead times and high implementation uncertainty
Existing infrastructure optimization	How well are we using existing equipment? Can existing infrastructure be leveraged?	High Maximizes current asset utilization or capacity	Medium Some reuse or efficiency gain from existing facilities.	Low Replaces existing assets without improving utilization.
Reliability and resilience impact	Does the proposed solution improve system reliability and resilience?	High Significantly reduces risk of outage frequency and duration	Medium Some reliability improvement	Low Minimal/no improvement for outage risks
Flexible management of customers' load and generation	Does the proposed solution use control of customer power input/output?	High Actively enables dynamic management	Medium Some interaction with flexible load or DERs	Low No enablement of customer-side flexibility

5.3.3 EQUITY, EMISSIONS, AND ENVIRONMENTAL JUSTICE

This section of the scorecard aims to ensure that grid investments and planning decisions are just, equitable, and aligned with broader societal goals, especially reduction in emissions. Evaluation categories are defined in Table 5-3.

TABLE 5-3 – EEEJ EVALUATION CATEGORIES

EVALUATION CATEGORY	DEFINITIONS	COMPARATIVE ASSESSMENT SCORECARD		
		Most Preferred	Middle	Least Preferred
Equity	Does affected grid infrastructure serve disadvantaged customers?	High >= 2/3 (66.7%)	Medium >= 1/3 (33.3%)	Low < 1/3 (33.3%)
Emissions	Does the solution increase or decrease emissions?	High Direct reduction of emissions	Medium Indirect reduction of emissions	Low Directly increases emissions
Environmental Justice	Does the solution require the development of new land?	Low No new land use or reduces land use	Medium Moderate increase in land-use	High Increases land use

The evaluation method of the EEEJ portion of the scorecard was shared with stakeholders during the Milestone 2.5 meeting in August 2025 which disclosed the proposed methodology and sought additional feedback for considerations.

5.3.4 POLICY ALIGNMENT

This portion of the scorecard evaluates whether the solutions align with certain enumerated policy goals, including peak load reduction, electrification readiness, integration of DERs, and state energy and climate goals. Evaluation categories are defined in Table 5-4.

TABLE 5-4 – POLICY ALIGNMENT EVALUATION CATEGORIES

EVALUATION CATEGORY	DEFINITIONS	COMPARATIVE ASSESSMENT SCORECARD		
		Most Preferred	Middle	Least Preferred
Peak load reduction	Does the proposed solution reduce peak load?	High Achieves significant peak reduction across multiple years.	Medium Provides moderate, temporary, localized peak reduction	Low Negligible impact on system peak
Electrification readiness	Does the proposed solution allow for future increase in load?	High Substantially expands or future-proofs grid capacity	Medium Moderate additional capacity	Low Marginal to no improvement in grid capacity
DER and renewables integration	Does the proposed solution allow for DERs and renewable integration?	High Directly promotes DER adoption or is a DER installation	Medium Enables moderate additional capacity for DER	Low Marginal to no capacity increase or limits DER hosting capacity
Advances state energy and climate goals	Does the solution help advance state goals?	High Directly advances Maine's clean-energy and climate mandates	Medium Indirectly supports state goals	Low Neutral or misaligned with state goals

5.4 SOLUTION TOOLBOX

Versant created a solution toolbox to identify feasible solutions capable of resolving identified violations and meeting system needs. The toolbox consists of traditional utility solutions along with various non-traditional solutions. Potential traditional utility solutions were determined and selected based on utility experience in mitigating violations of similar nature in the past and are aligned with current best industry practices. Potential non-traditional solutions were determined and selected based on stakeholder input, and/or observed experiences in other jurisdictions, including relevant pilot projects.

Grid needs were then matched with solution types capable of solving the corresponding need. A summary of the solution toolbox can be found in Table 5-5 and Table 5-6.

TABLE 5-5 –SOLUTION TOOLBOX FOR LOAD-DRIVEN SYSTEM NEEDS

SOLUTION TYPE	TYPICAL GRID NEED DRIVER
Settings upgrades for voltage support	Load growth on the system causing excessive voltage drops across system equipment (transformers, power lines, etc.) and resulting in lower voltages – causing customer equipment to malfunction or become damaged
Line and line device upgrades for load capacity	Increases in load that exceed device capacity causing rising temperatures within equipment, leading to overheating and potential failures
Major equipment upgrades to increase load capacity	Increases in load growth on distribution feeders or substations that exceed the thermal ratings of equipment and overloads a station transformer
Minor equipment upgrades for load capacity	Localized increase in load that overloads a minor distribution component such as a switch, service transformer or fuse.
BESS / storage / DER / NWA	Localized increases in load that could trigger major system upgrades, but could be addressed with targeted solutions
Demand response programs	Increases in load across multiple locations or customers that collectively exceed the capability of one or more portions of the system, where load reduction can be coordinated to reduce system stress

TABLE 5-6 – SOLUTION TOOLBOX FOR DER-DRIVEN SYSTEM NEEDS	
SOLUTION TYPE	TYPICAL GRID NEED DRIVER
Settings upgrades for voltage support	Injection or fluctuation of power into the system from a DER introduces a new voltage/current source and reduced feeder losses, causing voltage to rise – which can damage equipment and disrupt customer loads.
Line and line device upgrades for hosting capacity	Increases in DER output or fluctuation that exceed device hosting capacity due to high reverse power flow.
Major equipment upgrades to increase hosting capacity	Increases in DER penetration on distribution feeders or substations that push power flow above the nameplate rating of equipment and overloads a station transformer.
Minor equipment upgrades for hosting capacity	Localized increase in DER output that overloads a minor distribution component such as a switch, service transformer, or fuse.
BESS / storage	Localized increases in DER output or fluctuation that could trigger major system upgrades but could be addressed with targeted storage solutions.
DER Management System (DERMS)	Increases in DER output or fluctuation across multiple locations or customers that collectively exceed the capability of one or more portions of the system, where the DER output can be coordinated to reduce system stress and optimally serve the system as a whole.
Protection Device upgrades	Injection of power from DER causes miscoordination or mis-operation of outage mitigation / system protection devices.

5.5 DISTRIBUTION SCORECARD RESULTS

This section summarizes the scorecard results for approximately 100 targeted grid needs Versant identified, including the solutions considered and recommended. In total, the solutions evaluations and scorecard process identified:

- 114 device upgrades/installations;
- 15 miles of line upgrades;
- 30.3 miles of three-phase line extensions; and
- Six phase-balancing opportunities.

Details concerning violation types, solutions explored, and number of scorecards developed are shown in Table 5-7. A detailed breakdown of the upgrades mentioned above is provided in Table 5-8 and Table 5-9.

Most targeted needs were high severity, high consequences, and/or urgent thermal or voltage needs. Traditional utility solutions often were identified as the best fit due to their long life cycles, proven reliability, ease of execution, and lower operational complexity. However, Versant is committed to evaluating non-traditional solutions where they can provide benefits or meet grid needs, such as temporary capacity relief, as a capital deferral mechanism. As Versant advances projects through rate filings or Certificate of Public Convenience and Necessity (CPCN) applications, relevant projects will still undergo Maine's NWA review process ensuring evaluation of non-traditional solutions where they may provide value.

The IGP and scorecards indicate a total capital investment of approximately $125 million to $170 million would be required over the 10-year IGP time horizon to address all targeted load-driven distribution system needs. This range reflects a current estimate, and several factors could influence the ultimate actual costs of implementing IGP-identified solutions including, but not limited to: (1) the exact scope, location and timing of projects; (2) future equipment costs; and (3) supply chain factors. Final project scope, costs, and sequencing will be refined through Versant's capital review process, in coordination with reliability improvement, asset management, climate, and resilience programs.

A detailed breakdown of when system needs arise is highlighted in Table 5-7. A further detailed breakdown of each region's violations, solutions and capital is provided in Table 5-8 for the BHD region and Table 5-9 for the MPD region.

Based on its forecasts, Versant foresees significant load growth due to electrification, including EVs, heat pumps, and other new technologies. The scorecards have helped evaluate the most effective, and cost-effective, solutions to address identified load-driven system needs over the 10-year planning horizon, enable customers to adopt technologies aligned with emission reduction goals and the policy initiatives highlighted in Section 5.3.4, and maintain or improve system reliability and resilience.

5.6 TABLES

TABLE 5-7 – DETAILED VIOLATIONS SCORECARD SUMMARY					
VIOLATION TYPE	# OF SCORECARD	SCORECARD SOLUTION ALTERNATIVES EXPLORED			
Breaker-recloser overload	7	Device upgrade	Rephase	Demand response	Peak shifting - BESS dispatch
Conductor thermal overload	3	Reconductor	Rephase	Demand response	Circuit reconfiguration
Line regulator overload	25	Device upgrade	Rephase	Demand response	Peak shifting - BESS dispatch
Line undervoltage	12	Reconductor	Rephase	Install capacitor bank	Install line regulator
Step-down transformer overload	13	Device upgrade	Rephase or build new substation for the load	Demand response	Voltage conversion or three-phase line extension
Substation regulator overload	15	Device upgrade	Rephase	Replace regulator with load tap changing transformer	Peak shifting - BESS dispatch
Substation transformer overload	15	Device upgrade	New parallel transformer	Demand response	Peak shifting - BESS dispatch
Switch – sectionalizer overload	13	Device upgrade	Rephase	Demand response	Circuit reconfiguration

TABLE 5-8 – BHD SCORECARD SUMMARY				
VIOLATION TYPE	SOLUTION TYPE	INSTANCES	# OF DEVICE UPGRADES / INSTALLS	# OF MILES TO UPGRADE
Breaker-recloser overload	Device upgrade	7	7	N/A
Conductor overload	Reconductoring	2	N/A	3.63
	Rephasing and reconductoring	1	N/A	2
Line regulator overload	Rephasing	1	N/A	N/A
	Device upgrade	22	22	N/A
Line undervoltage	Installing line regulators	4	11	N/A
	Reconductoring	1	N/A	3.6
	Rephasing and installing line regulators	1	2	N/A
	Reconductoring and installing line regulators	1	3	1.7
	Installing line regulators and line capacitor	1	2	N/A
Stepdown transformer overload	Device upgrade	7	7	N/A
	New substation	1	2	N/A
	3-phase line extension	1	2	2.5
Substation regulator overload	Device upgrade	1	1	N/A
	Rephase	1	N/A	N/A
	Replace regulator with LTC transformer	9	4	N/A
Substation transformer overload	Device upgrade	11	11	N/A
Switch - sectionalizer overload	Device upgrade	13	13	N/A

TABLE 5-9 – MPD SCORECARD SUMMARY				
VIOLATION TYPE	SOLUTION TYPE	INSTANCES	# OF DEVICE UPGRADES / INSTALLS	# OF MILES TO UPGRADE
Line regulator overload	Device upgrade	2	2	N/A
Line undervoltage	Install line regulators	2	7	N/A
	Rephasing	1	N/A	N/A
	Build three-phase line, rephasing and line regulators	1	3	4
Substation regulator overload	Device upgrade	3	3	N/A
	Replace regulator with LTC transformer	1	N/A	N/A
Substation transformer overload	Device upgrade	4	4	N/A
Stepdown transformer overload	3-Phase line extension	2	6	27.8
	Device upgrade	2	2	N/A

5.7 TRANSMISSION SOLUTION IDENTIFICATION AND EVALUATION

As discussed in Section 5.6, transmission violations in the MPD were resolved through operational adjustments, and no further solutions were required. In contrast, the violations observed in BHD could not be resolved through operational reconfigurations alone; therefore, capital investment solutions—both traditional and non-traditional—were considered. Versant developed six potential solutions capable of addressing the violations identified in the BHD. These solutions include a range of possible enhancements such as Grid-Enhancing Technologies (GETs), non-traditional and traditional infrastructure upgrades. An overview of these solutions is provided below.

5.7.1 ALTERNATIVE A (SOLUTION 1):

- Install Grid Enhancing Technologies (GETs),[39] including a total of 28 Static Synchronous Compensator (STATCOM) devices and their associated step-up transformers for connection to Versant's transmission network. The total STATCOM capacity proposed is 108 MVAR.
- Reconfigure six normally open lines to be operated in a normally closed configuration.
- Install additional breakers (protection devices with communication capabilities) as needed to achieve desired network topology and safeguard newly added equipment.
- Reconductor 20 lines totaling 70 miles.
- Replace seven transformers.

5.7.2 ALTERNATIVE B (SOLUTION 2):

- Implement a demand response program to curtail the load across BHD by 10%.
- Install a total of 25 STATCOM devices and their associated step-up transformers for connection to Versant's transmission network. The total STATCOM capacity proposed is 92 MVAR.
- Reconfigure six normally open lines to be operated in a closed configuration under normal operating conditions.
- Install additional breakers (protection devices with communication capabilities) as needed to achieve the desired network topology and safeguard newly added equipment.
- Reconductor 20 lines totaling 70 miles.
- Replace seven transformers.

5.7.3 ALTERNATIVE C (SOLUTION 3):

- Reconfigure six normally open lines to be operated in a closed configuration under normal operating conditions.
- Install additional breakers (protection devices with communication capabilities) as needed to achieve the desired network topology and safeguard newly added equipment.
- Install a total of 14 BESS technologies between 1 MW and 16 MW with standard reactive power capabilities at strategic locations across the BHD, totaling 145 MW.

[39] Grid Enhancing Technologies (GETs) are hardware and software solutions designed to increase the capacity, efficiency, reliability, and flexibility of electric transmission systems. GETs can be used in conjunction with existing and new transmission infrastructure and can enable utilities and grid operators to optimize the use of assets, reduce congestion, and integrate renewable energy resources.

5.7.4 ALTERNATIVE D (SOLUTION 4):

- Same as Solution 1, with the addition of new reinforcements to manage future demand growth in Hancock and Washington divisions: one new line totaling 14.5 miles and two new transformers.

5.7.5 ALTERNATIVE E (SOLUTION 5):

- Same as Solution 4, with the addition of new reinforcements to alleviate loading in Hancock division: one new line totaling seven miles.

5.7.6 ALTERNATIVE F (SOLUTION 6):

- 10 new 115 kV lines and two new 34.5 kV lines, totaling 125 miles.
- Seven new 115/44 kV transformers and two new 115/34.5 kV transformers.
- 12 substation configuration upgrades or extensions.
- New breakers to protect the equipment being added.

Each of the six proposed solutions were further evaluated through contingency analysis within the BHD to ensure that the original violations were resolved, and no new violations were introduced. Additionally, each solution was assessed for steady-state voltage stability to evaluate future robustness and performance. The cost of each solution was also estimated. Results from the steady-state power flow analyses were incorporated into the scorecards as shown in the following section.

5.8 TRANSMISSION SCORECARD RESULTS

This section summarizes the transmission scorecard results and the corresponding feasible solutions to resolve violations in BHD. Figure 5-2 provides a summary of transmission scorecard results:

Description of System Need:		*Buses at the end of the sub-transmission paths in BHD experienced severe low voltages, and the lines and transformers at the beginning of the sub-transmission paths in BHD experienced overloading conditions.*					
Evaluation Category		Comparative Assessment Scorecard					
		Alternative A (Solution 1)	Alternative B (Solution 2)	Alternative C (Solution 3)	Alternative D (Solution 4)	Alternative E (Solution 5)	Alternative F (Solution 6)
Cost	Capital costs	Low	Low	High	Medium	Medium	High
	Operations & maintenance costs	Low	Low	High	Medium	Medium	High
	Avoided costs	Medium	Medium	Medium	Medium	Medium	High
Technical Performance	Efficacy	Medium	Medium	High	Medium	Medium	High
	Execution and schedule risk	Medium	Medium	Medium	Medium	Medium	High
	Existing infrastructure optimization	High	High	High	Medium	Medium	Low
	Reliability & resiliency impact	High	High	High	High	High	High
	Flexible management of customers' load and generation	Low	High	Low	Low	Low	Low
EJ	Equity	High	High	High	High	High	High
	Emissions impact	Medium	Medium	Low	Medium	Medium	Low
	Local environmental impact	Low	Low	Low	Medium	Medium	High
Policy Alignment	Peak load reduction	Low	High	Low	Low	Low	Low
	Electrification readiness	Medium	Medium	High	Medium	Medium	High
	DER and renewables integration	Medium	Medium	High	Medium	Medium	High
	Advances state energy and climate goals	High	High	High	High	High	High
	Overall prioritization ranking	1	2	5	3	4	6
Scorecard Narrative:		*Both Solution 1 and Solution 2 are preferred options due to the incorporation of grid-enhancing technologies. The main difference between these two solutions is that Solution 2 includes a demand response program, which is expected to increase its capital cost. As a result, detailed cost estimates should be developed collaboratively among the involved parties, including Efficiency Maine Trust, to ensure accuracy and alignment with ongoing initiatives. Overall, Solution 1 is the most preferred option for addressing the violations in BHD, followed by Solution 2. Solutions 4 and 5 are less favorable compared to Solution 1 and 2, while Solutions 3 and 6 are the most expensive and therefore less cost-effective solutions.*					

Figure 5-2 - Summary of Transmission Scorecard Results

Based on the metrics utilized for the development of the scorecards, the solutions were ranked in the following order:

Solution 1: This solution includes installing 28 Grid Enhancing Technologies (STATCOM devices) and implementing 39 traditional infrastructure upgrades (transformer replacements, line reconductoring, and the addition of protective devices).

Solution 2: This solution is similar to Solution 1, with the addition of a third-party demand response program, and installing 25 GETs (STATCOM devices) instead of 28 technologies.

Solution 3: This solution uses BESS devices along with 27 traditional infrastructure upgrades and protective devices.

Solution 4: This solution is the same as Solution 1, with the addition of new capital investments: 14.5 miles of new lines and two new transformers.

Solution 5: This solution is the same as Solution 4, with the addition of new capital investment: seven miles of new line.

Solution 6: This solution includes 51 traditional infrastructure upgrades (12 new lines totaling over 125 miles, nine new transformers, and additional protective devices).

Versant anticipates that a solution to address the BHD transmission needs would cost approximately $150 million to $200 million. Solutions 1 and 2 are the least expensive (approximately $150 million) and include GETs. Solutions 4 and 5 are approximately $200 million each. The main difference between Solutions 1 and 2 is that Solution 2 includes a demand response program, likely implemented by a third party, which may increase the overall cost of Solution 2. As a result, detailed cost estimates should be developed collaboratively among the parties involved, including EMT, to ensure accuracy and alignment with ongoing initiatives. This range reflects a current estimate, and several factors could influence the ultimate actual costs of implementing IGP-identified solutions including, but not limited to, the exact scope, location and timing of projects; future equipment costs; and supply chain factors.

The breakdown of the preferred Solution 1 capital solutions by division is as follows:

5.8.1 SOLUTION 1 DETAILS

Bangor Area

- Two STATCOMs at E. Avenue 44 kV plus two new breakers to protect the STATCOMs;
- Two STATCOMs at E. Corinth 44 kV plus two new breakers to protect the STATCOMs;
- Four STATCOMs at Hermon 44 kV plus four new breakers to protect the STATCOMs;
- Two STATCOMs at Milford 44 kV plus two new breakers to protect the STATCOMs;
- Two STATCOMs at Milo 44 kV plus two new breakers to protect the STATCOMs;
- Two Breakers at BIA 44 kV to protect closing lines 75 and 78 at BIA;
- Reconductor four 44 kV Lines: Line 10B, Line 71, Line 72, and Line 8;
- Replace Graham 115/44 kV Transformer 6 with a new one;
- Replace Graham 115/44 kV Transformer 8 with the existing Graham Transformer 9; and
- Replace Graham 115/44 kV Transformer 9 with a new one.

Hancock County

- Two STATCOMs at Acadia 34.5 kV plus two new breakers to protect the STATCOMs;
- Four STATCOMs at Blue Hill 44 kV plus four new breakers to protect the STATCOMs;
- Three STATCOMs at Trenton 5 kV plus three new breakers to protect the STATCOMs;
- Reconductor three 34.5 kV lines: Line 2, Line 32, and Line 48;
- Replace Trenton 115/34.5 kV transformer with a new one; and
- Replace Tunk 115/34.5 kV transformer with the existing Trenton 115/34.5 kV transformer.

Northern District[40]

- Two STATCOMs at Medway 44 kV plus two new breakers to protect the STATCOMs; and
- Replace Chester 115/44 kV transformer with a new one.

Washington County

- Two STATCOMs at Eastport 34.5kV plus two new breakers to protect the STATCOMs;
- Three STATCOMs at Washington 34.5 kV plus three new breakers to protect the STATCOMs;

[40] "Northern District" refers to the line district within BHD.

- Reconductor three 34.5 kV lines: Line 16/25, Line 16, and Line 20; and
- Replace Harrington 115/34.5 kV Transformer with a new one.

The total cost to deliver Solution 1 is approximately $150M

5.8.2 STATCOM CAPABILITIES

The STATCOM devices proposed for Solution 1 can provide fast, continuous reactive power support under variable generation conditions. For example, the figures below show sample daily load profiles and DER output for BHD under two different environmental conditions: Figure 5-3 represents a clear, sunny day, while Figure 5-4 represents a cloudy or partially sunny day.

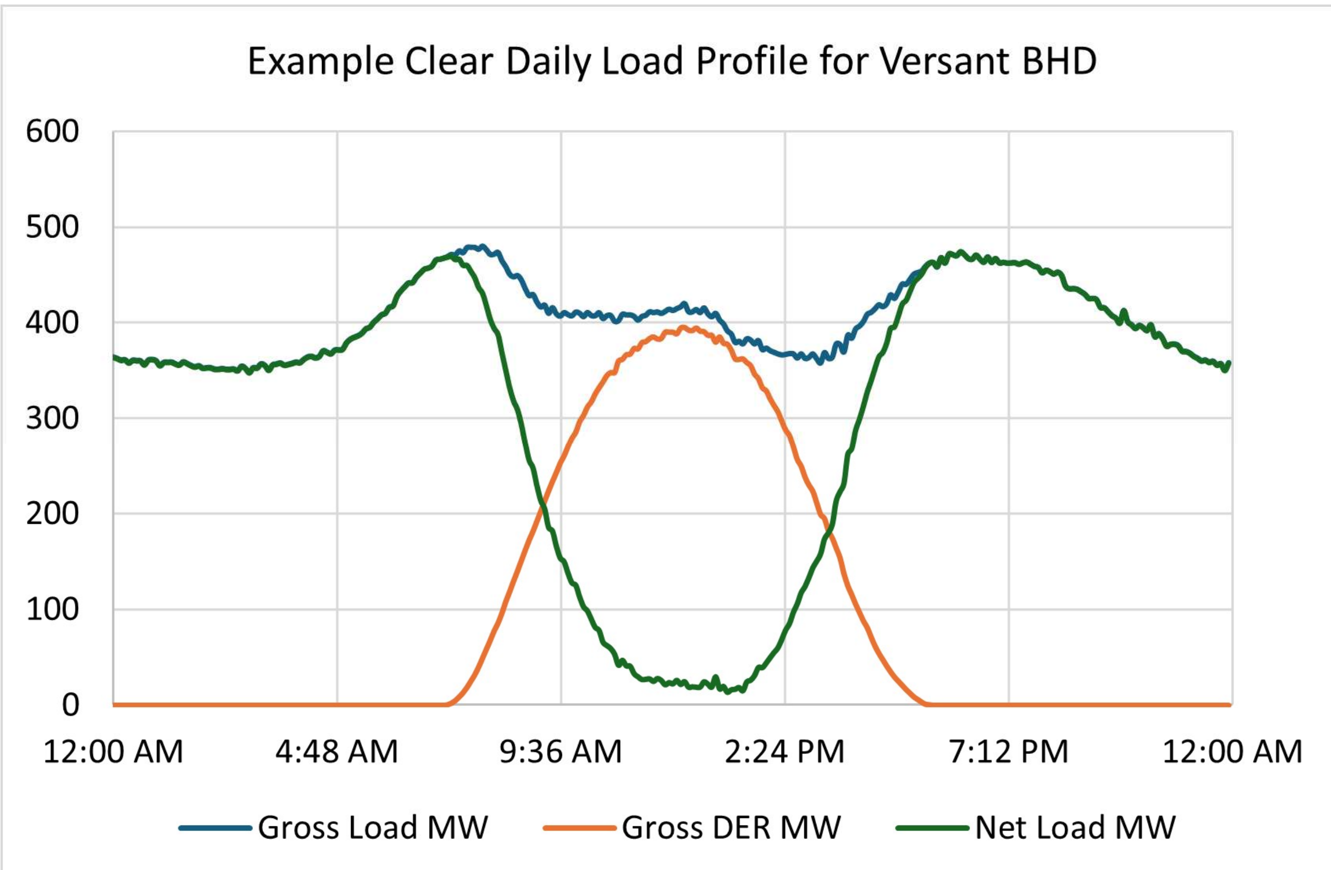

Figure 5-3 - Example Clear Daily Load Profile for Versant BHD

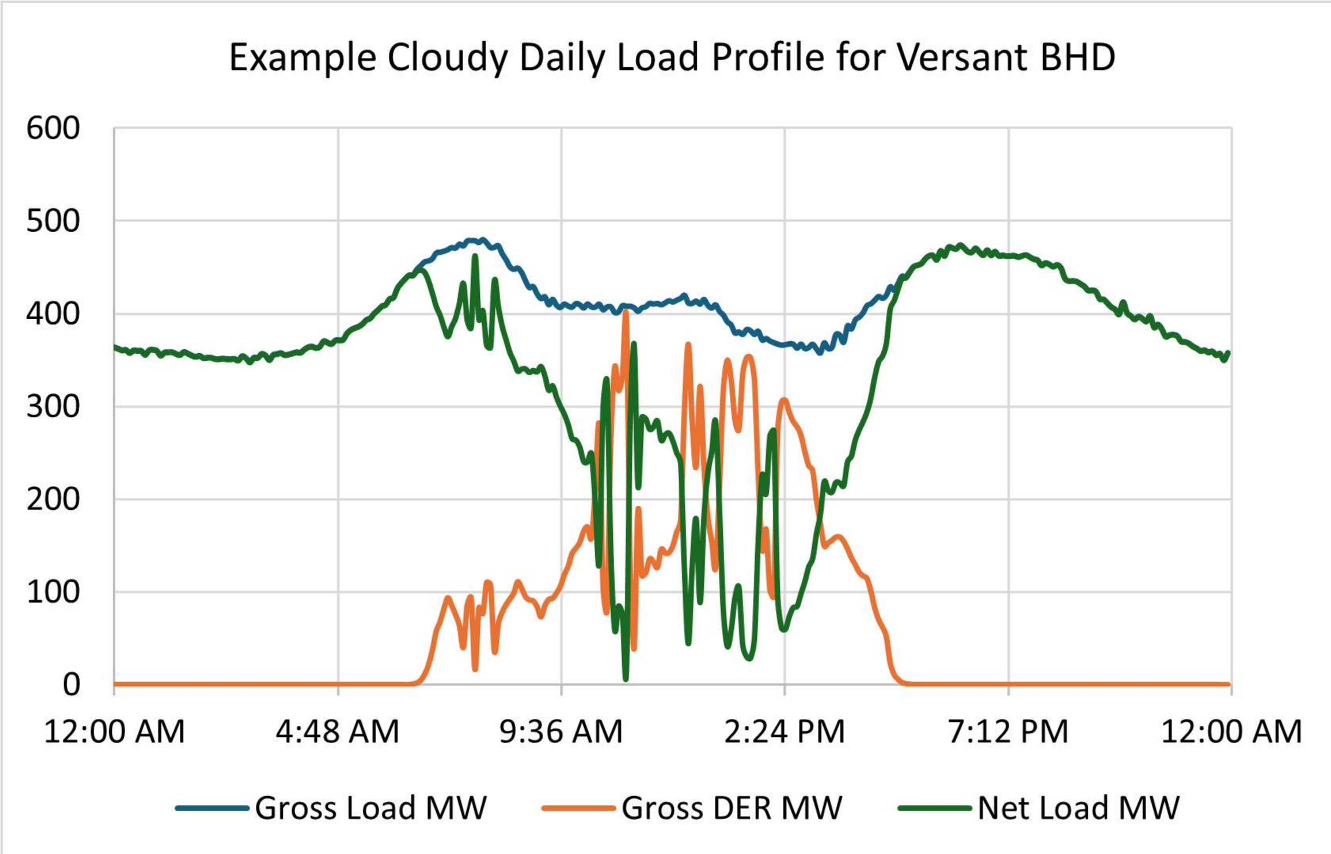

Figure 5-4 - Example Cloudy Daily Load Profile for Versant BHD

As shown in Figure 5-4, DER output can fluctuate significantly throughout the day (e.g., due to cloud cover). These variations cause rapid changes in net load that mechanically switched devices cannot effectively manage due to their limited switching speed and mechanical wear constraints. Dynamic devices such as STATCOMs are therefore essential to maintaining voltage stability and power quality. At the same time, there is an opportunity for cost optimization by co-locating mechanically switched devices alongside STATCOMs, and further design work will help clarify the potential benefits of this combined approach.

6. TECHNOLOGY, INTEGRATION, SYSTEMS INVESTMENTS AND PILOT PROJECTS

6.1 INTRODUCTION

Versant is committed to modernizing its grid through targeted investments in technologies and system enhancements that strengthen reliability, improve operational efficiency, and support the needs of its customers and the State's clean energy goals.

> Versant is upgrading its grid to be stronger, smarter, and ready for a clean-energy future.

Completed projects include the deployment of AMI, replacement of GIS, implementation of DER hosting capacity maps, and successful pilots of Conservation Voltage Reduction (CVR) and Volt-VAR Optimization (VVO).

Building on these, current key initiatives include streamlining processes for providing DER and load hosting capacity data to customers and advancing the deployment of an ADMS to elevate system safety and performance. The initiatives described below will enhance Versant's capabilities and enable continuous system improvement.

6.2 GRID MODERNIZATION TECHNOLOGIES

This section discusses available and emerging technologies capable of improving grid resilience for Versant's customers and facilitating the cost-effective achievement of Maine's climate and energy goals. It explores details of ADMS and DERMS, as well as their potential interactions with third-party entities (e.g., EMT). It also examines near-term and long-term technology investments needed for distribution planning and operations while tracking progress on implementing recommendations from the MPUC Grid Modernization docket (No. 2021-00039) roadmap report. It evaluates hosting capacity processes and results, analyzing DER and load integration potential, locational benefits of DER, and areas of existing or emerging system congestion. Finally, it reviews application processing and queue management for both load and generation interconnections, along with strategies for system integration and data management to ensure smooth grid operations.

6.2.1 GRID AUTOMATION AND MANAGEMENT

6.2.1.1 Advanced Distribution Management System

The electric grid is undergoing a major transformation driven by DERs, electrification, and growing customer expectations for reliability and resilience. Traditional systems like standalone SCADA and Outage Management Systems (OMS) operate in silos, providing limited real-time visibility, and lacking advanced analytics for operational decision-making. To overcome these challenges, Versant is implementing an Advanced Distribution Management System (ADMS), a next-generation platform that unifies operations, planning, and control. The rollout is scheduled for completion by mid-2029.

The ADMS will integrate data from GIS, AMI, and its Customer Information System (CIS) while replacing existing OMS and SCADA systems. It will deliver advanced capabilities such as SCADA device control, CVR, VVO, and Fault Location, Isolation, and Service Restoration (FLISR). Additional features include load flow analysis and switch order management. By consolidating these functions, ADMS will enable real-time operational awareness, improve planning accuracy, and enhance system flexibility—critical for building a modern, resilient grid.

The ADMS will support multiple benefits.

Enhanced Reliability

- Real time monitoring and automated outage management reduces restoration times, improving overall system reliability and customer satisfaction.
- FLISR enables rapid fault isolation and service restoration, minimizing customer impact.

Operational Efficiency

- Integrated applications such as CVR and VVO optimize voltage profiles, improving EE and reducing system losses.
- Supports hosting capacity for DERs by dynamically managing voltage and reactive power.
- In addition, it leverages Operational Technology (OT) to enhance asset management practices, ensuring efficient maintenance and compliance with safety and operational standards. This optimization leads to better asset performance and longevity.

Advanced Planning Capability

- ADMS provides accurate load flow and contingency analysis using real-time and historical data.
- Enables scenario modeling for DER integration, electrification impacts, and capital planning.

Centralized Control

- Integrating data and applications such as OMS, SCADA, and GIS into a unified platform for efficient operations.
- Operators gain a single, unified view of the distribution network with actionable insights.
- Enhance situational awareness and decision-making during normal and emergency conditions.

The ADMS implementation positions Versant to meet future grid challenges by improving reliability, enabling DER integration, and delivering cost-effective service. It transforms the distribution system from reactive to proactive, ensuring operational flexibility and customer value.

6.2.1.2 Distributed Energy Resource Management System

Versant plans to assess DERMS capabilities that could be implemented in 2029-2030. DER management capabilities will be required to enable certain flexible interconnection practices and objectives, e.g., those outlined within the federally funded Flexible Interconnection and Resilience for Maine (FIRM) project. Such capabilities will also enhance the safe and reliable operation of the grid in a high-DER penetration environment. Versant's assessment of DERMS will determine whether the goals of dynamic DER management (e.g. dynamic curtailment) can be achieved within the functionality of the ADMS or if a DERMS solution is required.

6.2.2 ADVANCED METERING INFRASTRUCTURE

As of 2025, Versant has completed AMI deployment throughout its entire service area. A total of 166,698 meter replacements have been completed with Itron's Centron meters. The meters can provide energy usage, voltage data, amperage, billing reads, load flow, high temperature alarms, meter events, and on-demand reads.

AMI implementation has provided multiple benefits to Versant and its customers, including:

- Remote service capability:

    - Versant's customers can have their service connected/disconnected remotely. This enables faster service activation time, and reallocation for meter service worker's time to higher-value tasks, i.e., event (outage, theft, etc.) investigations. These capabilities are unavailable for customers who have opted out of AMI meters.

- Outage detection and management:
    - Outage events from AMI meters are integrated with Versant's OMS. Meter pinging supports outage verification within the current OMS platform, empowering Versant to prioritize outages based on accuracy of the events.
- Safety monitoring and response:
    - AMI meters can monitor high temperature alarms. This provides insight into overloaded services, allowing either same-day disconnection for safety or notifying customers for electrical service upgrades.
- Tamper detection and investigation:
    - Tamper alerts and non-communicating meters provide insight into instances of meter tampering. This enhances Versant's ability to maintain system integrity and security.

Most of the Versant territory is covered by an IPv6 RF mesh communications network. In some cases, cellular meters are being utilized due to factors including geography, topology distances, and poor mesh network connectivity constraints.

AMI data is stored in a meter data management system while Versant works to load data into a warehouse to make it more accessible for reporting and analytics.

Versant customers have demonstrated increased engagement and user adaptation to AMI, as demonstrated by the customer portal data below:

From the period of July 1, 2021, through June 30, 2022, to the period of July 1, 2024, through June 30, 2025, based on average monthly totals, there was a:

- 38% increase in customer portal visits;
- 7% increase in views (unique sessions) of the "My Energy" electricity usage site;
- 45.7% increase in weekly usage reports sent to email subscribers; and
- 67.9% increase in weekly usage reports opened by email subscribers.

Once deployed, Versant will be integrating AMI data into its ADMS platform, which will provide operational and reliability benefits to Versant's customers.

6.2.3 DER HOSTING CAPACITY AND INTEGRATION TOOLS

Versant has a Hosting Capacity Map available on its website. This tool is designed to assist DER developers in making more informed decisions by identifying areas on Versant's system where it may be possible to avoid existing or potential system congestion. The map contains the following key information:

- Geographic location of areas with available capacity;
- Color-coded estimated remaining hosting capacity levels showing the estimated amount of available capacity without major upgrades in kW as shown in Figure 6-1; and

- Circuit information includes the Circuit ID, phase configuration, and conductor sizes at the desired interconnection point.

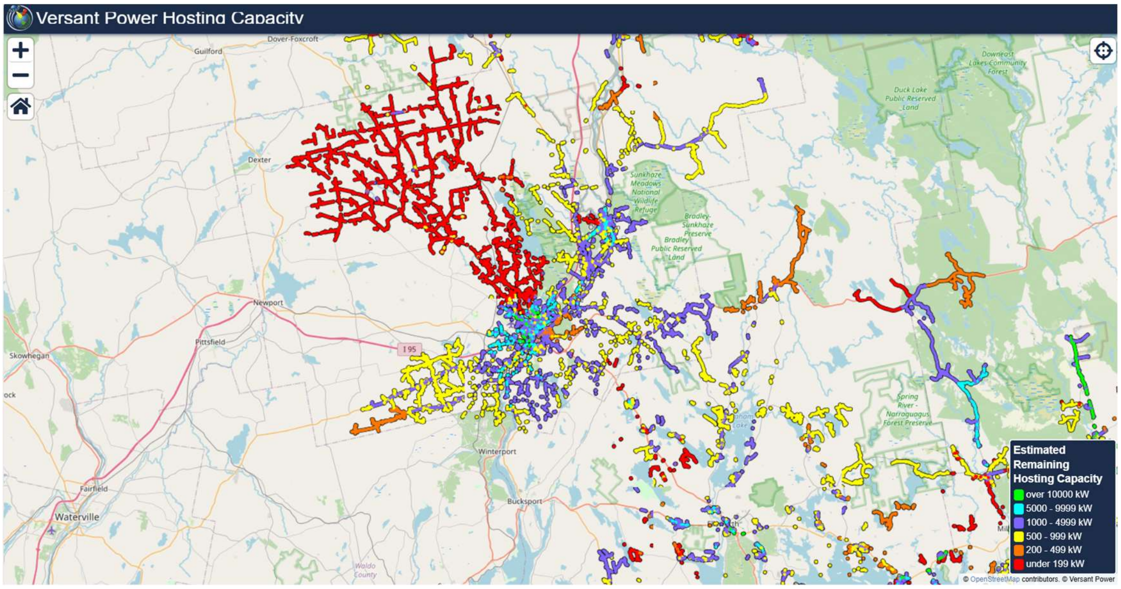

Figure 6-1 - Versant Hosting Capacity Map Overview

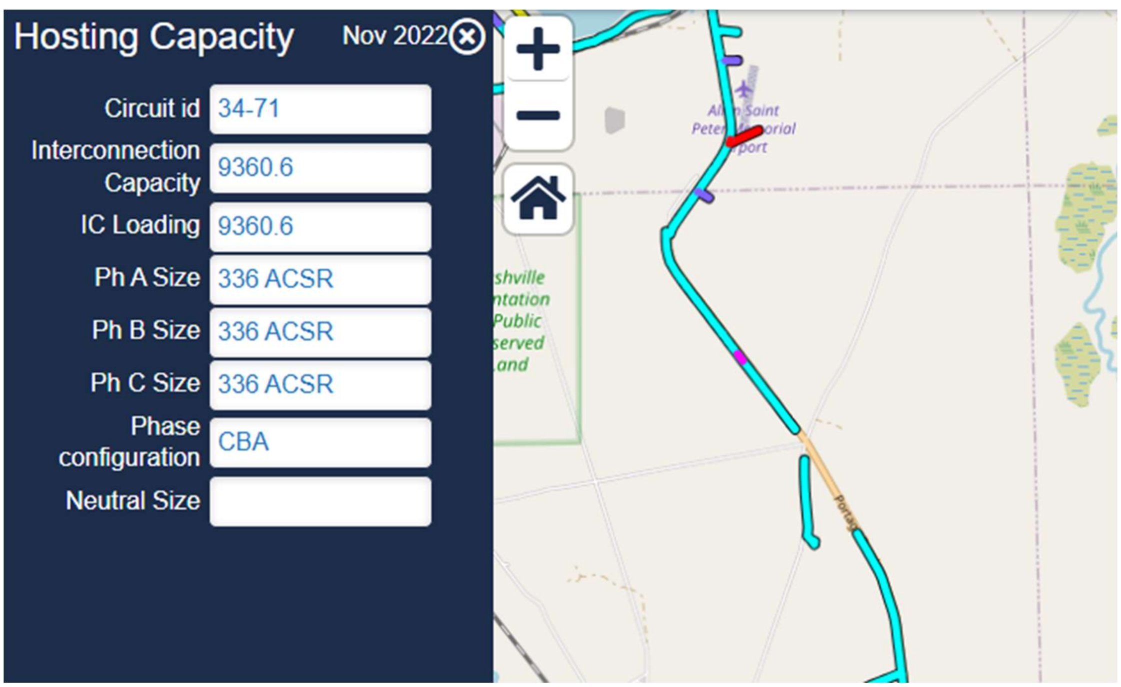

Figure 6-2 - Versant Hosting Capacity Map Circuit Details

The Hosting Capacity Map is updated annually to accurately represent the distribution system's ability to integrate DERs. This process ensures transparency for stakeholders evaluating DER interconnection opportunities.

The methodology begins with a comprehensive model validation for each circuit. This includes updating thermal ratings, validating capacitor and voltage regulator settings, assessing minimum daytime loads, incorporating planned capital projects, and ensuring overall model accuracy. Following validation, the Integrated Capacity Analysis (ICA) tool from CYME is used to conduct Hosting Capacity Analysis.

The analysis evaluates two key constraints:

- Thermal limits: ensuring equipment is not overloaded; and
- Voltage limits: maintaining voltage within ANSI C84.1 Range A standards.

For each node, the ICA tool calculates the maximum generation capacity under both constraints. The lower of the two values is selected to represent the hosting capacity, providing a safe estimate. The results are compiled into a report, reviewed for accuracy, and published on Versant's website.

A new release for DER hosting capacity map is planned in 2026 with improvement in features and additional datapoints as follows:

- Distribution systems' operating voltage at the node;
- Substation transformer information: nameplate rating, allocated generation, queued Level 4 generation;
- Substation circuit information: rating, allocated generation, Level 4 queued generation;
- Measurement in miles back to the substation;
- Base map selection;
- Underground delineation; and
- Phase configuration.

These changes align with CMP's generation hosting capacity map, resulting in a consistent and standard format of DER hosting capacity maps across both utilities, an identified goal of the MPUC Order.

In addition to the DER hosting capacity map, Versant will be rolling out a load hosting capacity map in 2026. This will provide available capacity for additional load on the distribution system, helping customers make informed decisions on load interconnection for, e.g., BESSs, EV charging stations, or industrial load growth.

Similar to the DER interconnection process, Versant follows a queued study process for large loads seeking interconnection with Versant's grid. The study involves reviewing capacity, thermal, and voltage violations per Versant's guidelines. In addition, safety related issues, such as protection and coordination settings and fuse coordination, are reviewed and mitigations identified. Versant works collaboratively with its customers to ensure safe and timely energization of large-load interconnections.

6.2.4 DER AND ELECTRIFICATION INTEGRATION

This section discusses Versant's DER integration process and how such interconnections contribute to the accomplishment of state climate and energy goals.

- To streamline processes for DER interconnection, Versant has developed process flows which vary depending on the level of the project (i.e., Levels 1-4 as defined by the MPUC Chapter 324 – Small Generator Interconnection Procedures). Process flows highlight major process stages, key stakeholders for each stage, process steps, decisions, and targeted timelines. Smartsheet software is utilized to manage progress and track major milestones within the various application stages. These tools, combined with the refined process flow, have enabled Versant to effectively manage a high volume of DER interconnection requests. While customers and developers drive DER adoption, Versant recognizes it has an important role to play by enabling interconnections in a manner that prioritizes system safety and reliability. In addition to DER projects, Versant has supported the integration of BESS and other developer-led initiatives into the grid, in accordance with Chapter 324. The Company remains committed to continuously refining its processes.

- In alignment with Maine's clean energy objectives, Versant has also explored the potential use of grid-tied BESS to mitigate thermal overload violations identified in Section 5. Versant will continue to evaluate the applicability of Energy Storage Systems (ESS) in future IGP efforts and system reliability enhancements.
- To support beneficial electrification (e.g., the adoption of EVs), Versant will launch a load hosting capacity map, as discussed above. This tool will allow customers to assess the available capacity on the distribution system and help determine whether additional load—such as EV charging infrastructure—may be interconnected without triggering system upgrades. By helping users identify optimal project locations and avoid congested areas, the map facilitates more efficient planning and deployment.

6.2.5 DATA INTEGRATION AND ANALYTICS

This section discusses steps Versant has taken to utilize data for analytics and enhance the ability of various Company departments to perform their duties more effectively.

Versant conducted a pilot project to aggregate its data from OMS and AMI systems through another server where an analytics platform helps the users prepare, blend, and analyze data through a defined structure. This enabled Versant engineers to more quickly and efficiently track outages and identify worst performing circuits. This enables planning engineers to strategically plan reliability projects to reduce customer outages.

Versant is also making progress in deploying Enterprise Service Bus (ESB), which plays a crucial role in realizing the full potential of analytics and data integration, ensuring seamless and scalable connectivity across various systems. The ESB operational technology (OT) will be rolled out as part of the ADMS program.

As Versant increasingly integrates data across multiple platforms, the Company is developing robust data governance and AI policies. Data governance provides a structured framework for managing data quality, ownership, and accessibility, which is essential for operational efficiency, and regulatory compliance. As data analytics and integration become more integrated into the business units, Versant will continue to modify and monitor its governance policies. Fostering a culture of data protection, governance, and cybersecurity awareness among personnel ensures advanced analytics capabilities not only boost grid performance but also uphold the highest standards of reliability, safety, and service for customers and communities.

6.3 PILOTS AND DEMONSTRATIONS

This section reviews the status and key findings of existing and recent pilot projects, assessing their value and scalability. Pilot projects explore innovative technologies and applications being evaluated for grid modernization plus evaluation of more widespread adoption. Additionally, it identifies evolving needs that may require new tools or solutions to address gaps in current capabilities.

6.3.1 RECENT AND CURRENT PILOT PROJECTS AND FINDINGS

Versant has conducted numerous pilot projects for improving system operations by preventing outages, locating and isolating system faults, creating EE via CVR, improving power quality by minimizing voltage sags, swells and flicker from voltage fluctuations caused by DER, and supporting safer DG grid interconnections in a cost-effective manner.

Volt/VAR Optimization

Versant has piloted and now widely implemented the utilization of DER Volt/VAR operation by leveraging the smart capabilities of inverter-based DER. This includes performing VVO studies for all non-fixed power factor Level 4 DER projects. The VVO studies determine load tap-changing (LTC) transformer and voltage regulator setpoints, switched capacitor control setpoints and DER inverter Volt/VAR settings, all integrated and coordinated to maintain voltage within service limits. Volt/VAR operation maximizes existing feeder conductor capacity by allowing a DER facility to absorb a voltage-level dependent magnitude of VARs to reduce the voltage rise the facility causes with their export. The VARs absorbed are directly proportional to the feeder voltage. It is critical for the DER facility to maintain the VVO settings per utility specifications since the DER is essentially providing voltage regulation to the feeder and other customers.

Versant is one of the first utilities to standardize implementation of Volt/VAR controls by DER facilities mainly due to voltage regulation responsibilities. This has facilitated significant DER penetration while simultaneously avoiding many miles of reconductoring. Volt/VAR implementation has been successful from operational and cost-effectiveness perspectives.

- **CVR 1.0:** Versant completed a regional CVR project in 2018 on the Hampden substation circuits. Voltage readings from a bellwether set of meters were polled every 15 minutes. This information was used to determine whether voltage on the circuits could be safely lowered. Utilizing an alternate week ON/OFF schedule over the one-year test period, the pilot project measured the voltage reduction that was achieved and calculated the corresponding energy reduction. The CVR pilot successfully proved a correlation between voltage reduction and energy reduction.
- **CVR 2.0:** Versant is expanding its CVR pilot to enhance capabilities and add a circuit in 2026. Voltage readings from AMI will be used to optimize circuit voltages by polling a bellwether set of meters every 15 minutes. Both the lowest meter voltage readings and the highest meter voltage readings will be included in the bellwether meters. This will allow real-time automatic changes to circuit voltages to maintain stable conditions during a changing grid environment.

EV Charging

Versant Power has been conducting an EV charging pilot project to evaluate the feasibility of expanding its EV fleet. The initiative includes 24 small-class pickup trucks and three transit vans deployed across the Company's operations. By monitoring performance and collecting data from these vehicles, Versant aims to determine whether increasing EV adoption is a practical and cost-effective strategy for the future.

Automated Switching

Versant has piloted switching devices to improve the reliability and flexibility of its distribution. Since then, these devices have been standardized and integrated into Versant's planning and operations. Tested devices include:

- **Siemens CMR Recloser**: Versant was among the first utilities to pilot and adopt this single-phase vacuum bottle electronic recloser and sectionalizer in 2019. Designed for rural and less populated areas, it offers advanced reclosing and sectionalizing capabilities, improved coordination, enhanced data collection, and monitoring. By replacing older V4H oil-filled hydraulic reclosers with no data capabilities, this device significantly improves reliability and system visibility. A total of 246 units have been installed across Versant's grid from 2020 to 2025. Collectively, CMRs have saved 15,039 service interruptions and mitigated 93,469 service hours of interruptions from 2020 to 2024 on a pre-exclusion basis.

- **Cooper/Eaton NOVA Recloser:** Beginning in 2019, Nova reclosers were piloted within Versant's grid. Since then, Versant standardized its recloser specifications to Eaton NOVA as they enhance protection, control, and data collection and monitoring capabilities. The NOVA device utilizes three-phase voltage and current sensors and communicates with SCADA for near real-time monitoring. This standardization supports a tolerance-based high-density coordination approach, ensuring effective reliability even in rural, vegetation-dense areas. Over the period of seven years from 2019 to 2025, a total of 359 of these devices have been installed in Versant's grid. The Cooper/Eaton NOVA installs that are implemented to target improvement in reliability have resulted in 83,320 service interruptions saved and 615,958 service hours of interruptions saved between 2020 and 2024, on a pre-exclusion basis.

- **FLISR and SEL Distribution Automation Controller (DAC):** Various FLISR systems were piloted starting in 2019 and ultimately standardized on the DAC as the FLISR platform due to its ease of use and adaptability for line crews, technicians, and engineers. DAC delivers significant benefits, including improved system reliability and resilience by reducing outage frequency and duration. The DAC enables rapid fault detection, isolation, and service restoration, which improves SAIDI and enhances overall grid performance.
- **Fault Indicators:** Versant has long utilized fault indicators to help crews quickly locate faults and reduce restoration times. While traditional devices provide basic visual cues, the need for greater system intelligence and real-time visibility has driven the adoption of smart fault indicators. Pilots with devices such as the SEL-FLT/FLR and FT50 demonstrated significant advantages: They integrate with SCADA to deliver near real-time status updates, improve data collection, and enhance situational awareness in critical areas. These capabilities support faster decision-making, reduce outage durations, and strengthen overall grid reliability. Currently, Versant has deployed more than 25 sets of SCADA integrated fault indicators.

6.3.2 PROPOSED AND FUTURE PILOTS EMERGING TECHNOLOGIES TO EXPLORE

Versant remains focused on evaluating and implementing pilots that use innovative technologies to enhance grid safety, reliability, provide data visibility, or offer other benefits to the grid and/or customers. The following section discusses potential pilot projects Versant has identified and which the Company believes may be capable of cost-effectively meeting system needs utilizing innovative and/or non-traditional utility technologies or strategies.

6.3.2.1 Deer/Isle Stonington BESS Microgrid

Working with national, regional, and community partners, including the Island Institute, through an Energy Technology Innovation Partnership Project of the United States Department of Energy, Versant developed a proposal and worked with the Maine DOER to seek federal funding for the Deer Isle BESS Project, a pilot initiative aimed at enhancing energy resilience and reliability for the rural coastal communities of Deer Isle and Stonington, Maine.

The project proposed the installation of microgrid with an 8 MWh BESS in Stonington, providing backup power and regulation for approximately 1,300 customers and keeping critical community infrastructure online during an outage. This project would be the first such deployment on the Versant system. Complementary grid hardening measures, including the replacement of wood poles with high-strength composite poles and the use of ruggedized spacer cable, will further protect about 2,850 customers across 40 square miles from storm-related outages.

By leveraging proven technologies and collaborating with local stakeholders, the project directly addresses affordability and reliability for a coastal community and could serve as a model for other similar projects.

6.3.2.2 Eastport BESS/Tidal Power Microgrid

The Eastern Maine Microgrid Pilot Project, led by Ocean Renewable Power Company (ORPC), Versant, the Island Institute, and key community partners, proposed to enhance energy reliability and resilience for the rural communities of Eastport and the Pleasant Point Tribal Reservation in Washington County, Maine.

This initiative would deploy a microgrid integrating tidal energy (approximately 500 kW), battery energy storage (2 MW/4 MWh), and future solar PV, replacing an existing aging and unreliable diesel backup system that has since been decommissioned.

The project would provide backup power during grid interruptions, support grid stability, and foster economic development through local job creation and technical training. By leveraging tidal energy as a baseload resource, the microgrid would serve as a replicable model for clean, resilient energy infrastructure in remote communities, aligning with state and federal climate and equity goals while directly addressing local affordability, reliability, and sustainability challenges.

6.3.2.3 Collaboration with Efficiency Maine Trust on Distributed Battery Storage/Managed Charging

The Efficiency Maine Trust 2026-2028 Triennial Plan describes EMT's DER Initiative that includes two equipment categories: managed charging of EVs and small batteries for emergency backup power. As Versant understands it, the backup battery program is similar to the successful program deployed by Green Mountain Power in Vermont.

Versant sees potential to collaborate with EMT and the Trust's technical partners on identifying locations on the grid where aggregated small BTM storage devices and/or managed EV charging may be leveraged to meet future system needs by reducing load or shifting load from periods of peak demand. In certain cases, load shifting may have the potential to defer or delay traditional utility upgrades that could otherwise be required to meet future system needs.

Such a project would require significant coordination and data-sharing among Versant, EMT, and customers to identify potentially eligible locations, enroll customers, and manage events among other needs.

6.3.3 POTENTIAL NEW RATE DESIGNS, CUSTOMER PROGRAMS, AND TECHNOLOGIES

Versant believes potential exists for customers to provide value to the grid via innovative rates, programs or technologies. Approaches including demand response and flexible demand management, time-varying or technology specific rates, and technologies that enable load flexibility (e.g., controllable thermostats, managed EV charging and energy storage) are all capable of shifting or shaping load to meet grid needs and, potentially, defer the need for otherwise necessary grid upgrades. When carefully structured and managed, these strategies may also provide meaningful benefits to customers, including bill savings or other financial incentives.

Given Maine's deregulated electricity industry, the successful implementation of customer-centric programs—whether behavioral or technological—will require close coordination between utilities and other relevant actors including, in some cases, customers themselves. Additionally, sufficient incentives, as well as necessary information and signals, may be required for customers to effectively participate. As the entity singularly responsible for the safe and reliable operation of the grid, utilities must also be able to depend on grid services being provided when needed in line with all applicable standards and requirements.

While such considerations increase the complexity and uncertainty around these types of innovative measures, Versant believes they may be important tools in ensuring the grid can meet future needs while maintaining affordability.

6.3.4 REGULATORY SANDBOX

The concept of a "regulatory sandbox" may be a means of exploring the feasibility of non-traditional approaches in a limited fashion that reduces risk until proven to be effective, scalable, and beneficial.

A regulatory sandbox can be defined as "a type of innovation vehicle that offers a structured environment for testing new technologies and business approaches under modified rules to increase the speed of adoption. Regulatory sandboxes establish processes, with appropriate guardrails, for utilities to take on calculated risks that might not otherwise be feasible under standard regulatory practices and to quickly adapt to learnings during the trial phase and through identified scaling strategies."[41]

Versant recognizes that certain potential pilot projects or innovative approaches may not align with the current regulatory or statutory frameworks in Maine. Others may necessitate collaboration among various public and private sector actors to implement (e.g., utilities, EMT, third-party suppliers, aggregators, etc.).

Among the challenges Versant has identified evaluating the implementation of certain innovative solutions, whether at the pilot stage or more broadly across the system, are unresolved questions regarding how new technologies or approaches would interface with existing statutory and regulatory requirements and how relevant entities would interact with one another to deploy non-traditional solutions. Examples of these include uncertainty surrounding the rules or guidelines that may govern utility ownership and operation of BESS solutions and how, e.g., a utility would interface with a third-party aggregator to implement a demand response program in a manner that conforms with existing requirements and ensures the utility is able to meet its core responsibility of providing safe and reliable service.

Versant recognizes that these are complex questions but also believes it is important for utilities and other parties to have the flexibility to implement innovative solutions where they are capable of cost-effectively meeting grid needs.

Versant supports consideration of the adoption of a regulatory sandbox approach in Maine and can envision several cases where it could be beneficial. Versant would be interested in working with regulators, policymakers, and stakeholders on approaches that could enable the deployment of such solutions while minimizing risk to customers and utilities and unlocking the potential for non-traditional solutions to play a larger role in cost-effectively meeting future system needs.

6.4 CONCLUSION

Versant is committed to implementing technological advancements to improve flexibility and reliability and support its customers in meeting the State's clean energy goals. The Company has already undertaken significant projects, including ADMS implementation, a full AMI rollout, and the integration of smart technologies like reclosers and FLISR systems, to leverage innovative technological solutions to cost-effectively meet current and projected system needs and improve service quality for customers.

Hosting capacity maps for both DER and load will enable customers to plan projects more efficiently by identifying areas with available capacity. Versant's DER interconnections process framework has improved interconnection timeframes and allowed

[41] Grace Relf, *Deploying Regulatory Sandboxes to Support Grid Resilience*, Lawrence Berkeley National Laboratory, Docket No. 2024-00191, at 9 (April 8, 2025).

the Company to respond to the rapid increase in interconnection applications seen in recent years. The AMI system has enhanced outage detection, safety monitoring, and customer engagement through improved data access.

These efforts reflect Versant's commitment to building a smarter, more resilient grid and the Company looks forward to collaborating with policymakers, regulators and stakeholders to identify, evaluate and implement additional proven and cost-effective solutions.

7. ENVIRONMENTAL, EQUITY, AND ENVIRONMENTAL JUSTICE

7.1 INTRODUCTION

Maine's first IGP places an important emphasis on Environmental, Equity and Environmental Justice considerations with a goal of ensuring future grid investments are carried out in a manner that supports environmental stewardship and promotes equitable outcomes and inclusive participation for historically underserved and disadvantaged communities.

This section discusses Versant's approach to addressing EEEJ impacts in the IGP process—including the solicitation and integration of stakeholder feedback—and how these impacts were considered in the planning process itself. It also proposes a series of evaluation criteria capable of tracking EEEJ impacts of IGP-driven investments over time.

Including EEEJ impacts in the IGP ensures equitable, inclusive, and environmentally responsible planning.

The scorecard template included in the MPUC Order included three primary metrics the utilities were instructed to utilize to evaluate the EEEJ impacts of potential grid solutions. These metrics, including the key questions used to define them for the Versant IGP process, are:

- **Equity:** Do potential solutions benefit or harm disadvantaged customers in Versant's service territory?
- **Emissions:** Do potential solutions affect local or global emissions? Is the impact positive or negative?
- **Environmental Impact:** Do potential solutions affect the physical environment? If so, to what extent?

In line with the approach taken across the IGP process, Versant developed a method of evaluating each of these factors relatively, resulting in "high," "medium" or "low" assessments based on defined criteria.

Versant recognizes that there are other considerations that are relevant and important to an EEEJ assessment of grid investments, including:

1. Energy reliability;
2. Affordability/energy burden;
3. Support for electrification; and
4. Simplified interconnection of DERs.

Each of these factors is addressed elsewhere in the IGP scoring framework (e.g., affordability is directly related to project cost, a key criterion; support for electrification and the interconnection of DER is directly related to policy alignment evaluations, etc.). These factors were not also directly assessed in the EEEJ section of the scorecard to avoid "double-counting." While Versant's approach to EEEJ evaluation was driven by the scorecard template, the Company recognizes that some stakeholders have suggested a more comprehensive version of EEEJ scoring and would be willing to collaborate on this concept for future iterations of the IGP.

Below the Company discusses details of how EEEJ metrics were determined and applied to the IGP scorecard; Versant's approach to community engagement to solicit EEEJ feedback and the feedback it received; the ways in which EEEJ stakeholder feedback was incorporated into Versant's IGP; and a discussion of the how EEEJ factors influenced the Solution Portfolio.

7.2 APPROACH TO EEEJ IMPACTS

This section provides a summary of the approach for considering EEEJ impacts within the IGP scorecard.

7.2.1 EQUITY IMPACT

The Equity Impact metric assesses how potential solutions would affect—either positively or negatively—disadvantaged communities. Given the nature of the IGP project and Versant's status as a T&D-only utility, equity impacts were primarily positive, and scoring was focused on evaluating the relative differences in the scale of benefits and how they were allocated.

Incorporating stakeholder feedback, Versant elected to utilize the federal Climate and Economic Justice Screening Tool (CEJST 2.0) dataset to identify disadvantaged customers by census tract. Census tracts in CEJST are considered disadvantaged if they meet the thresholds for at least one of the defined categories of burden, or if they are on land within the boundaries of Federally Recognized Tribes. The CEJST categories of burden are:

1. Climate change;
2. Energy;
3. Health;
4. Housing;
5. Legacy pollution;
6. Transportation;
7. Water and wastewater; and
8. Workforce development.

Versant identified disadvantaged customers by overlaying customer geographical data (latitude and longitude) with Census tract boundaries. Customers included within Census tracts considered disadvantaged by CEJST were considered disadvantaged customers. According to this analysis:

- 56 of 99 (57%) of Versant Census tracts are considered disadvantaged by CEJST; and
- 63,299 of 143,989 (44%) of Versant customers are in Census tracts considered disadvantaged by CEJST.

Figure 7-1 provides a summary of disadvantaged Census tracts that contain Versant customers.

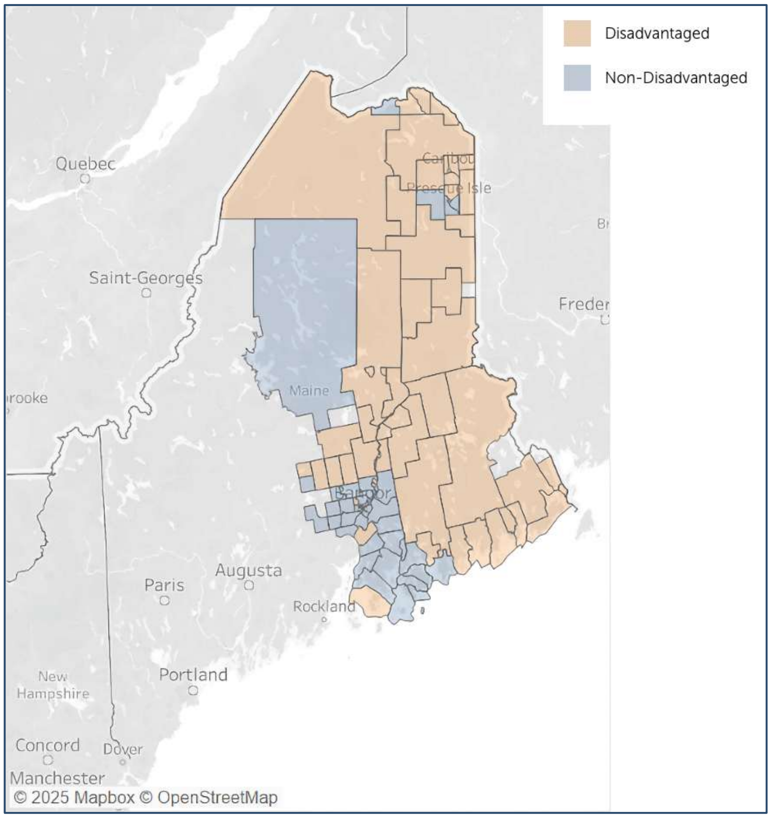

Figure 7-1 - Disadvantaged Census Tracts in Versant Service Territory

To evaluate whether an IGP solution would benefit (or harm) disadvantaged customers, Versant analyzed each circuit to determine the percentage of customers residing in disadvantaged census tracts. Since distribution circuits are not limited to specific census tracts, these circuits often cross census tract boundaries and touch census tracts that are both disadvantaged and non-disadvantaged. To address this, Versant gave each circuit an equity score based on the percentage of customers on the circuit that were disadvantaged. Each potential IGP solution was then assigned the equity score corresponding to the circuit for which the upgrade is proposed.

The same logic was used to define EEEJ equity impact scores at the substation level by aggregating all the feeder data up to the substation level and calculating the percentage of disadvantaged customers served by each substation.

Table 7-1 provides a summary of how the percentage of disadvantaged customers maps to the equity score.

TABLE 7-1 – EQUITY SCORE MAPPING

PERCENT DISADVANTAGED CUSTOMERS	EEEJ EQUITY IMPACT
66% - 100%	High (3)
33% - 66%	Medium (2)
0% - 33%	Low (1)

Figure 7-2 shows Versant infrastructure classifications based on EEEJ equity score, including both at the feeder and substation level.

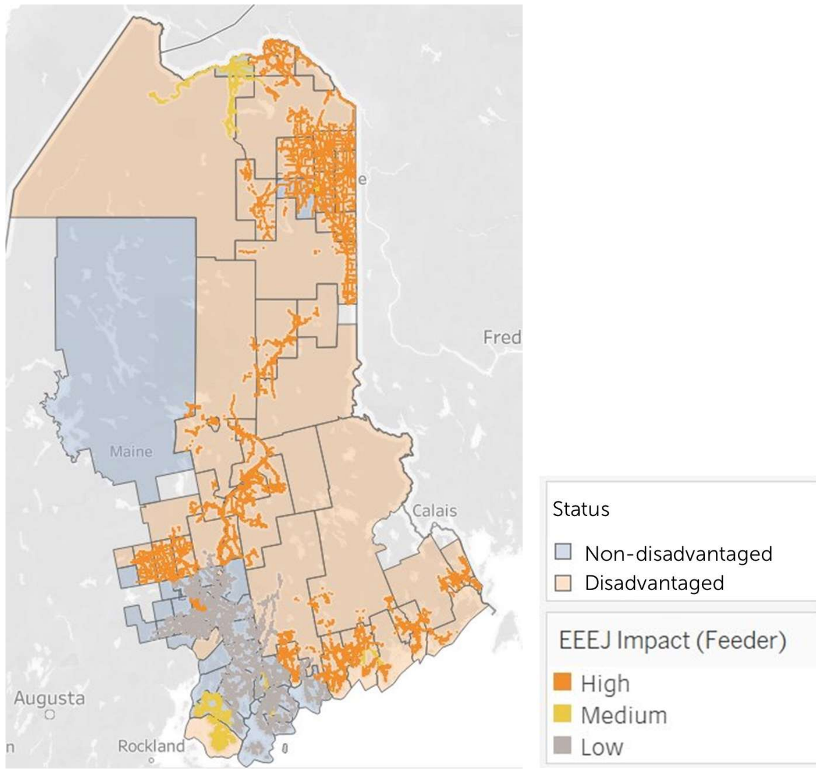

Figure 7-2 - Versant Feeder Lines by EEEJ Impact Score

A summary of the percentage of disadvantaged customers and the EEEJ equity score for each feeder and substation has been included in Appendix D.

7.2.2 EMISSIONS

The emissions impact metric assesses the extent to which a specific solution will increase or decrease GHG or local emissions. Each solution type was classified into one of three categories, ranked by the most desirable to the least desirable: (1) directly reduce emissions; (2) indirectly reduce emissions; and (3) increase emissions.

Because Maine is a deregulated state, potential solutions proposed by the IGP are primarily distribution or transmission focused. As such, solutions in the direct emissions reduction category included those that directly reduce system losses or inefficiencies, decrease peak load, or decrease system maintenance requirements, thereby reducing maintenance truck rolls.

Indirect emissions reduction was assigned to projects that reduce grid emissions indirectly by increasing grid capacity for interconnection or more renewables and beneficial electrification.

Finally, emissions increase is assigned to projects that directly increase emissions (e.g., a new diesel generator installed to provide temporary peak load generation for a capacity constrained area, or backup supply, before a grid upgrade can be made).

Table 7-2 provides a summary of each emissions impact category and includes corresponding solution examples.

TABLE 7-2 – EMISSIONS IMPACT CATEGORIES AND EXAMPLES		
EMISSIONS IMPACT	TYPES OF IMPACT	EXAMPLES
Direct reduction	• Reduce system losses/inefficiencies • Decrease peak load • Decrease maintenance requirements	• Loss reduction • Reconductoring • Efficiency upgrades • Solar and battery microgrids • Resilience back up • Reduce load/peak shifting • Demand response • Energy efficiency programs
Indirect reduction	• Increase grid capacity for renewables and beneficial electrification	• Grid enhancing technologies • Equipment capacity upgrades • Flexible interconnection
Increase	• Directly increase emissions	• New diesel backup generation

7.2.3 ENVIRONMENTAL IMPACT

The environmental impact metric assesses the extent to which a specific solution will affect the local, physical environment. This assessment does not include emissions, which are covered in a separate EEEJ impact metric, as described above. This metric focuses on whether a proposed solution will increase or decrease the development of new land. This was chosen because many negative environmental impacts—such as habitat loss, displacement of farmland, disturbance of local wetlands, and increases of water runoff and potential for flooding—are the result of increased land development.

To assess this metric, Versant classified each grid solution type into the following categories, ordered from most desirable to least desirable:

- **Low/Decreased Land Use:** Solutions that do not require the building or expansion of new poles, wires or substations, such as demand response and EE programs, software solutions, grid enhancing technologies (e.g., dynamic line ratings, dynamic transformer ratings, powerflow control, topology optimization), curtailing export generation, and equipment replacements.
- **Medium Land Use:** Solutions that require upgrades to poles, wires or substations or new installations of distributed solar or batteries.
- **High Land Use:** Solutions that require the building of new grid infrastructure such as poles, wires, substations, or utility-scale storage.

Table 7-3 provides a summary of each environmental impact category and includes corresponding solution examples.

TABLE 7-3 – ENVIRONMENTAL IMPACT CATEGORIES AND EXAMPLES		
ENVIRONMENTAL IMPACT	TYPES OF IMPACT	EXAMPLES
Low	• No new land-use • Reduction of land-use	• Demand response • Energy efficiency • GETs • Reduce load/peak shifting • Curtail export generation • Equipment replacements
Medium	• Moderate increase in land-use	• Upgraded generation • Upgraded substation • Upgraded feeder / transmission lines in existing corridor • Distributed energy storage • Distributed microgrids
High	• Increased land-use	• New generation • Grid-scale energy storage • New substation • New feeder / transmission lines in new corridor

7.3 INCORPORATION OF EEEJ FEEDBACK

As detailed in the Introduction, Versant engaged in a rigorous community engagement process to seek feedback on its IGP, including specific outreach and education on our efforts to ensure all customers benefits from future investment. Versant's Milestone 2.5 meeting, and all 18 community meetings, included and solicited information from attendees on how the utility could identify and meet EEEJ needs. These discussions were supported by regular requests for feedback made through the Grid and Climate email newsletter.

This section summarizes EEEJ feedback and provides a summary of how feedback was considered and incorporated into the approach to EEEJ impacts and the resulting EEEJ scoring.

Feedback Item 1: Use the Climate and Economic Justice Screening Tool (CEJST) for disadvantaged community definitions.

Stakeholder comments recommended the CEJST dataset as a robust definition of disadvantaged communities regarding energy equity. The Company reviewed the dataset and agreed it was appropriate for use in this first IGP.

Of note, this definition is appropriate as it:

- Is at a suitable level of granularity in assessing disadvantaged status at a census tract level. The Equity analysis identified 99 census tracts with an average of 1,454 customers per census tract.
- Explicitly includes tribal communities. Such communities could be considered disadvantaged if they are on land within the boundaries of Federally Recognized Tribes.
- Explicitly includes energy burden in its definition. Communities at or above the 90th percentile for energy cost OR in PM2.5 air quality AND are at or above the 65th percentile for low income are considered disadvantaged.

The CJEST 2.0 dataset was released on December 19, 2024, but was removed from the federal website in early 2025. An archived version of the dataset was available at time of publication from the Public Environmental Data Partners.[42] Versant supports using CEJST on an ongoing basis to track disadvantaged customers within the service territory, but future IGPs might consider new, updated sources if the CEJST data become out of date.

Feedback Item 2: Cross reference other EEEJ metrics covered elsewhere in the plan (e.g., cost, affordability/energy burden, reliability, and deployment of DERs).

Versant defined the EEEJ categories identified on the example scorecard in a way that captures the relevant impacts of potential solutions while avoiding the risk of "double-counting" impacts addressed elsewhere on the scorecard.

However, Versant recognizes that there are other considerations that are important to holistic EEEJ assessment and notes that such factors are captured by other evaluation criteria (e.g., affordability is reflected in project cost as well as in the CJEST definition used to identify disadvantaged communities, which includes an evaluation of relative energy burden), as discussed above. Versant recognizes that a more comprehensive aggregate scoring of EEEJ metrics could be useful in future iterations of the IGP and is open to working with regulators and stakeholders on such an approach as part of the stakeholder engagement process preceding the initiation of the next IGP.

[42] Pub. Env't Data Partners, *Climate and Economic Justice Screening Tool: About*, https://public-environmental-data-partners.github.io/j40-cejst-2/en/about/ (last visited Jan. 9, 2026).

Feedback Item 3: Assesses whether a solution could bring harm to a disadvantaged community.

Versant received stakeholder feedback that recommended assessing both whether a potential solution provides benefits to a disadvantaged community and whether a potential solution brings harm to a disadvantaged community (e.g., disadvantaged communities are disproportionately burdened with overhead high voltage transmission lines when compared with more affluent communities).

Versant agreed with this feedback and, in response, more broadly defined its EEEJ evaluation to consider "impacts" to disadvantaged communities rather than "benefits".

However, as discussed above, Versant's analysis still assumes that grid solutions will primarily bring benefits to the communities they serve, including increased local capacity for electrification and DERs or potential economic and workforce development benefits from investments in the local community. As such, the Equity metric considers the extent to which such benefits equitably accrue to disadvantaged communities.

In other jurisdictions, especially where utilities are vertically integrated, EEEJ impact analysis frequently focuses on harm mitigation for disadvantaged communities (e.g., related to the siting of new generation infrastructure that may increase harmful local emissions). In Maine's deregulated market, T&D utilities operate independently of generation, meaning they have no influence over siting decisions for new power plants.

Feedback Item 5: Perform a more comprehensive benefits and cost analysis in the evaluation of alternatives and specify specific benefits being quantified (reduced outages, efficiency investments).

A more detailed approach to Benefits and Cost Analysis (BCA) and engineering analysis was also proposed during the initial stakeholder engagement process preceding the MPUC Order. For example, as summarized in the Order, "The Joint Commenters recommended requiring the utilities to perform a BCA that would include all relevant costs and benefits."[43]

The Order chose instead to adopt a scorecard approach given, among other factors, the nature of the IGP as a high-level analysis that may not include the level of detail necessary to reasonably conduct more comprehensive BCA or engineering analyses. At the same time, the Order notes that the utilities maintain flexibility to "provide more detail, justification, and transparency to the solutions evaluation process in their grid plans."[44]

In this IGP, including in the accompanying appendices, Versant has provided a significant amount of data and analysis regarding its system modeling, need identification, and solutions evaluation processes. The Company believes this information will be valuable to stakeholders and regulators as Maine considers the best pathways to accomplish our state climate and energy goals while cost-effectively maintaining reliability and resilience.

Versant recognizes the value that transparent and detailed cost benefit analyses and engineering analyses have when considering specific project proposals. The Company looks forward to providing such information and engaging with relevant parties during the regulatory processes (rate cases, CPCN applications, NWA evaluations) where individual IGP-driven projects will be evaluated.

[43] MPUC Order at 28.

[44] *Id.* at 30.

Feedback Item 6: Provide more quantitative measures and metrics for EEEJ metrics.

As discussed above, potential grid solutions identified by IGP largely lack the level of individualized detail necessary to realistically calculate detailed quantitative metrics for many measures. For example, until an exact project location, size, or technology is known, it may not be possible to determine specific emissions or land impacts.

Based on stakeholder feedback, Versant has provided a complete list of Company feeders and substations along with their EEEJ equity scores in Appendix D which may be valuable to stakeholders and the public seeking to further understand the EEEJ impacts of potential grid solutions.

Feedback Item 7: Provide a more granular level of analysis at the census block level instead of the census tract level.

Based in part on stakeholder feedback, Versant elected to utilize the CEJST dataset which operates at the census tract level. The Company believes these data are high-quality, comprehensive and provide sufficient granularity for analysis.

For future IGPs, Versant is open to considering a more granular approach including a more granular disadvantaged community definition and looking at smaller segments of the electrical grid (e.g., feeder segments). However, because disadvantaged and non-disadvantaged communities tend to be clustered and EEEJ impacts may affect communities in a wide geographic area, it is not clear that this would lead to substantially different or better EEEJ scoring for individual solutions. Versant believes this discussion should also be informed by the best available data at the initiation of the next IGP iteration.

Feedback Item 8: Support a robust evaluation of NWAs, including GETs at the distribution level (e.g., dynamic line ratings, dynamic transmission ratings).

Versant agrees that an important element of integrated grid planning is to assess non-traditional solutions, including NWAs and GETs, and to identify when these solutions are capable of reliably and cost-effectively meeting grid needs. For the distribution system, Versant's IGP assesses non-traditional alternatives to utility infrastructure investments, including:

- Microgrids;
- DERs plus BESS;
- Stand-alone BESS;
- Demand response (e.g., managed EV charging); and
- Energy efficiency.

For the transmission system, Versant similarly evaluated non-traditional solutions to system needs including GETs and BESS. The two best-fit solutions to meet the projected transmission system needs identified by this IGP include significant use of GETs (STATCOMs), reflecting these technologies' ability to cost-effectively meet grid needs in certain cases.

Ultimately, Versant elected not to include dynamic line/transformer ratings specifically. While these technologies can help increase the power capacity of components of the system in real time under certain conditions, as a standalone solution, they are unlikely to increase the capacity of the system under peak load conditions, one of the primary cases for which IGP-driven solutions must account.

7.4 SCORECARD EXAMPLE

This section provides an example of how EEEJ impacts were considered in the scorecards. Figure 7-3 shows a regulator overload where four different solutions were considered:

1. Increasing the regulator size
2. Rephasing
3. Customer-side load reduction

- Utility-scale load reduction

Description of System Need:		*100 A regulator has rating exceeded in 2024. Additional thermal capacity is required.*			
		Comparative Assessment Scorecard			
	Evaluation Category	Option A: Increase Reg Size	Option B: Rephasing	Option C: Customer-Side Load Reduction	Option D: Utility-Scale Load Reduction
Cost	Capital costs *(higher # = higher cost)*	Medium	Low	High	High
Cost	Operations & maintenance costs *(higher # = higher cost)*	Low	Low	High	Medium
Cost	Avoided costs *(higher # = higher cost)*	Low	High	Medium	Medium
Technical Performance	Efficacy	Medium	Low	Low	Medium
Technical Performance	Execution and schedule risk	Medium	Low	High	High
Technical Performance	Existing infrastructure optimization	Low	High	High	Medium
Technical Performance	Reliability & resiliency impact	Medium	Low	Low	Low
Technical Performance	Flexible management of customers' load and generation	Low	Low	High	High
EEEJ	Equity	High	High	High	High
EEEJ	Emissions impact	Medium	Low	High	High
EEEJ	Local environmental impact	Low	Low	Low	High
Policy Alignment	Peak load reduction	Low	Low	High	High
Policy Alignment	Electrification readiness	Medium	Low	Medium	Medium
Policy Alignment	DER and renewables integration	Medium	Low	Low	High
Policy Alignment	Advances state energy and climate goals	Medium	Low	High	High
	Overall prioritization ranking	*1*	*2*	*4*	*3*
Scorecard Narrative:		*Option A (device replacement) is the preferred option in this scenario. The forecasted loading exceeds 100% of the thermal rating relatively early in the 10 year forecast. This rules out peak shifting/demand response and rephasing due to lack of efficacy. Option D (Utility owned BESS) has similar efficacy to Option A. However, this option presents challenges in terms of land acquisition and constuction (excecution and schedule risk). Lastly, the advanced age of the existing device requires replacement within the 10 year forecast anyways.*			

Figure 7-3 - Example Scorecard

In this case, the regulator being upgraded was on a feeder line where 70% of the customers served were in census tracts considered disadvantaged in the CEJST dataset, so all potential solutions earn an equity impact score of high, meaning they predominately serve disadvantaged customers.

Figure 7-4 provides an illustration of the relevant feeder outside Fort Kent. The feeder straddles two census tracts with different CJEST designations but has over 70% of customers located in a census tract considered disadvantaged by the CEJST data.

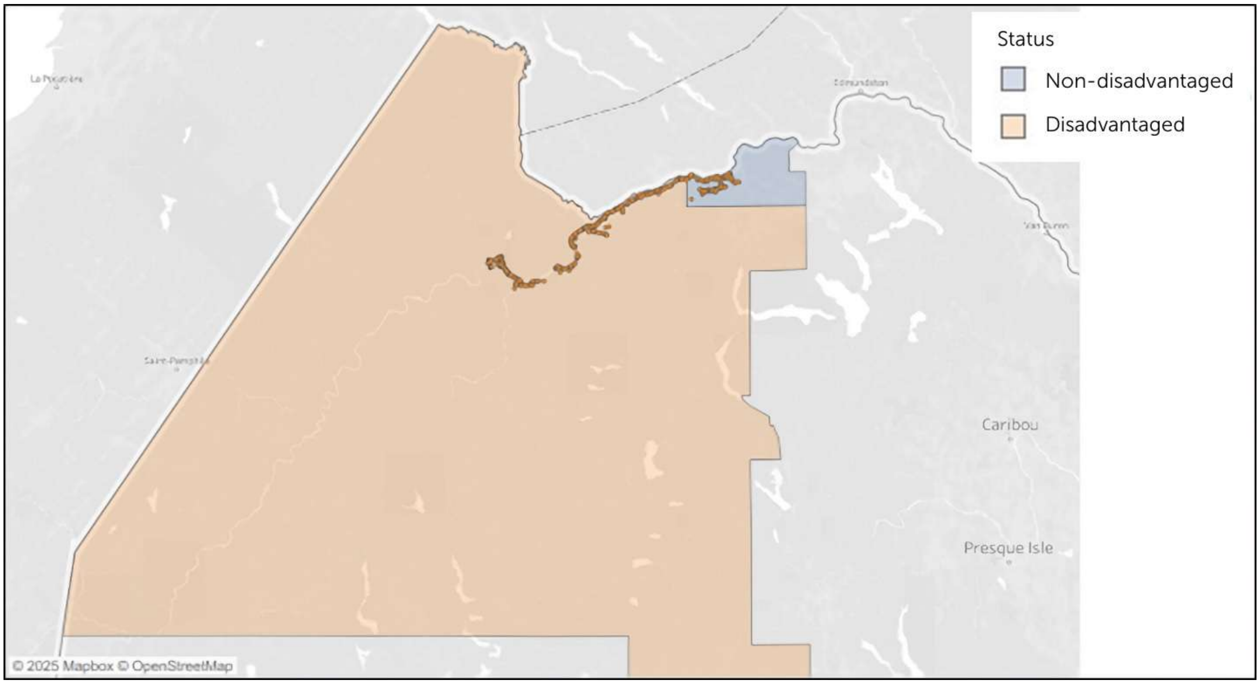

Figure 7-4 - View of High Equity Feeder from the Example Scorecard

For emissions impact, the load reduction programs earn an emissions impact score of high, meaning they reduce emissions through the reduction of peak load where grid emissions intensity is typically highest, while the two traditional solutions earn a low and medium score on emissions. On environmental impacts, three of four solutions have low environmental impact as they do not require the use or disturbance of new land. The exception is the utility-scale load reduction, which scores high as it likely would require a new utility-scale storage system to provide significant load reduction.

7.5 ONGOING EEEJ METRIC TRACKING

The development of EEEJ metrics and the collection of EEEJ related data will make it possible for Versant to track EEEJ grid investments in disadvantaged communities over time. This data can be used to refine the IGP development process to continue to understand the impact of IGP-driven investments on disadvantaged customers in the Versant service territory.

Using the equity score definition developed for this IGP, Versant will begin tracking projects to upgrade feeders and substations categorized by the EEEJ equity score. In future IGP filings, Versant will ensure collection of the following data for each grid upgrade project:

- Circuit and/or substation;
- EEEJ equity score for circuit and/or substation ("high," "medium," or "low");
- Cost of project;
- Upgrade project type/reason for upgrade;
- Capacity addition (kW/MW) for distribution/transmission; and
- Number of customers affected.

Table 7-4. provides a summary of the project types and reasons for upgrades to be tracked for the ongoing EEEJ tracking.

TABLE 7-4 – PROJECT TYPES FOR ONGOING EEEJ TRACKING

INVESTMENT CATEGORY	PROJECT TYPE	DESCRIPTION
Capacity (IGP)	Capacity	Projects which address a shortfall of capacity on the grid. These projects typically address overloaded infrastructure that is approaching the thermal design limit of the hardware.
	Voltage support	Projects which address over or under voltage situations on the grid to keep the system within the tolerated voltage range for normal operation.
Reliability	Sustaining	Projects that maintain the reliability of the grid by replacing aging or dysfunctional hardware that could fail and decrease the uptime of the system.
	Improving	Projects that increase the reliability of the grid by hardening the existing system to reduce future failures that could decrease the uptime of the system.
Asset Health	Asset condition	Projects triggered by an asset inspection that identifies the need for an upgrade.
Resilience	Climate and storm hardening	Projects identified through the Versant Climate Vulnerability Study that aim to address weaknesses in the current grid that could be vulnerable to the effects of climate change such as increased frequency and intensity of extreme weather events.

Versant will aggregate the data from all grid projects to provide specific metrics segmented by each of the three EEEJ equity scores. These metrics include:

- Investment dollars;

- Grid capacity upgrades (nameplate) for relevant projects;[45] and
- Number of customers affected.

In addition to tracking new projects by feeder and substation, Versant will also track other data to understand the drivers of grid upgrades in certain areas of the grid. These could include

- New DER installations / projected installations;
- Load growth / projected load growth; and
- Ability to serve projected future load/DERs.

After collecting this data, Versant intends to provide a summary of findings to the public and interested parties as part of the development of subsequent IGP iterations. This first round of data collection can be used to establish a baseline of investments impacting disadvantaged communities for future tracking.

[45] E.g., projects aimed at voltage support do not necessarily increase the capacity of the grid.

8. ASSESSMENT AND CONTINUOUS IMPROVEMENT

8.1 PURPOSE

The purpose of the IGP assessment is to evaluate the effectiveness of Versant's inaugural IGP and establish a foundation for continuous improvement in future IGP iterations.

This assessment includes the Company's approach in accomplishing key identified goals, lessons learned, opportunities for refinement, and areas where additional data, tools, or processes may enhance future iterations of the plan. The assessment focuses not only on technical outcomes, but also on procedural elements including stakeholder participation, internal coordination, and transparency in decision-making.

By formalizing a structured assessment process, capturing both successes and challenges from this inaugural IGP cycle, Versant aims to embed a culture of continuous learning and improvement within its planning functions and future IGP cycles. This adaptive approach ensures the IGP remains a relevant and effective tool for modernizing the grid.

8.2 REGULATORY REQUIREMENTS

The proposed IGP Assessment fulfills specific requirements established by the MPUC in Docket No. 2022-00322.[46] The MPUC directed each investor-owned utility to include within its IGP a structured evaluation of process effectiveness, measurable outcomes, and lessons learned from the inaugural planning cycle.

Specifically, the Order requires Versant to: (1) propose metrics that can be used to evaluate the success of the IGP in meeting its objectives over time; (2) document lessons learned from the planning process; and (3) recommend revisions to planning assumptions, methodologies, and stakeholder engagement practices for future cycles.

These requirements ensure that the IGP evolves through evidence-based improvement and that each subsequent filing demonstrates measurable progress. In addition, the MPUC Order mandates that the IGP demonstrate alignment with Maine's GHG reduction goals, identified EEEJ considerations, and the broader policy and climate goals articulated in the MWW climate action plan.

By incorporating these regulatory requirements, the IGP assessment reinforces transparency, accountability, and continuous improvement within Versant's grid-planning framework.

8.3 METRICS

Versant proposes metrics that can help measure the IGP and how it enables cost-effective achievement of the State's clean energy goals while focusing on IGP priorities.

[46] MPUC Order at Attachment C (stating that the IGP should include "Section 8.a: Proposed metrics or other means to measure the effectiveness of the grid plan and progress towards the priorities and [sic] improving reliability, resiliency and enabling the cost-effective achievement of the State's GHG emission reduction and climate policies. Within the evaluation framework, the utilities should include lessons learned and proposed changes to future planning assumptions and methodologies.").

8.3.1 ENABLING SOLUTIONS

The IGP identified numerous solutions to address the grid needs associated with the growth of beneficial electrification and DERs in Versant's service territory. Tracking the implementation of these solutions will provide insight into how the IGP supports and improves the T&D planning process overall (Table 8-1).

TABLE 8-1 – ENABLING SOLUTIONS	
METRIC	DESCRIPTION
IGP solutions identified	The number of IGP solutions identified to enable beneficial electrification and DERs
IGP solutions implemented or planned	The number of IGP solutions implemented or planned to enable beneficial electrification and DERs
Non-traditional solutions evaluated	The number of non-traditional solutions evaluated to enable beneficial electrification and DERs
Enabling technologies implemented or planned	The enabling technologies implemented or planned to achieve IGP goals and priorities. These include, but are not limited to, ADMS, DERMS, time-series analysis

8.3.2 EEEJ

EEEJ metrics will help refine the IGP development process and provide insight into the impact of IGP-driven investments on disadvantaged customers in the Versant service territory. Using the equity score definition developed for this IGP, Versant proposes to incorporate EEEJ metrics into its IGP project tracking approach (Table 8-2). Versant will include project tracking results, including EEEJ scores, every five years as part of its updated IGP.

TABLE 8-2 – PROJECT TRACKING	
METRIC	DESCRIPTION
Circuit or Substation	The portion of the system where a project is planned
EEEJ score	The equity score for the project (e.g., High, Medium, Low based on the portion of disadvantaged customers per circuit)
Project cost	The cost of the project
Project type or purpose	The project type or the grid needs that it addresses
# customers affected	The number of customers served by the infrastructure associated with the project

8.4 LESSONS LEARNED

8.4.1 GOVERNANCE

The governance structure for Versant's IGP process demonstrated the importance of clear accountability, cross-functional collaboration, and transparent engagement with stakeholders. One key takeaway was the value of defining roles early: following the MPUC Order, Versant's approach enabled streamlined coordination across data collection, technical analysis, and stakeholder input. Similarly, MPUC's transition from active facilitation to oversight highlighted how regulatory clarity supports compliance and transparency. Broad stakeholder participation—through public meetings, technical sessions, and formal comments—reinforced the need for inclusive planning to reflect diverse perspectives and local priorities. Internally, Versant learned that strong interdepartmental alignment and an active Steering Committee were essential for integrating technical, financial, and policy considerations. Regular checkpoints with CMP underscored the benefits of utility collaboration on forecasting, modeling, and equity considerations. These experiences collectively illustrate that early role definition, structured engagement, and iterative coordination are critical for successful integrated grid planning.

8.4.2 TIMELINE

Versant's 18-month IGP process demonstrated the value of structured milestones and proactive stakeholder engagement. By hosting two additional sessions beyond the IGP Order requirements, Versant learned that early and frequent dialogue improves clarity on forecasting assumptions and system needs. Incorporating diverse feedback—through public forums, written comments, and one-on-one discussions—proved essential for refining solutions and aligning with policy goals. External factors, such as Maine's climate action plan and CELT forecasts, reinforced the importance of adaptability in planning assumptions. These experiences highlight that transparency, flexibility, and stakeholder collaboration are critical for building robust methodologies and informing future IGP iterations.

8.4.3 STAKEHOLDER ENGAGEMENT

Versant's first IGP process demonstrated the critical role of stakeholder engagement in building transparency and trust. A multi-faceted approach, including technical workshops, community meetings, targeted outreach, and online tools, successfully broadened participation and improved clarity. The process demonstrated that early and frequent engagement fosters shared understanding, but future iterations could communicate modeling assumptions sooner and strengthen alignment with related regulatory initiatives. Linking IGP objectives to other processes and consolidating dockets will enhance efficiency and clarity. These insights will guide improvements in timing, coordination, and integration, ensuring that transparency and collaboration remain central to Versant's planning framework.

8.4.4 STATE AND REGIONAL PLANNING COORDINATION

This IGP process underscored the importance of coordination across regional, state, and utility planning. Aligning with ISO-NE and neighboring utilities ensured consistent forecasting and scenario validation, while collaborating with state agencies advanced climate resilience and decarbonization goals. Engagement with programmatic partners like EMT and OPA strengthened demand-side strategies, and monitoring federal directives positioned Versant to adapt to evolving grid modernization requirements. The process revealed that information sharing and proactive coordination could help ensure that clear priorities and assumptions underpin ongoing grid planning.

8.4.5 IGP METHODOLOGY

8.4.5.1 Forecasting

The IGP process demonstrated the value of a dual forecasting approach that integrates top-down regional forecasts with bottom-up localized projections. This hybrid methodology provided a balanced perspective, aligning long-term transmission objectives with granular distribution-level realities. Versant identified several benefits and future opportunities for IGP forecasting and scenarios.

Regional Forecasts: Combining ISO-NE's CELT-based regional forecasts with detailed substation and circuit-level projections improved accuracy, and coincident peak-based regional forecasts can underestimate distribution-level peaks and minimums for load and DER output.

Localized Forecasts: Incorporating EV adoption, heat pumps, DER growth, and feeder peak data can provide critical insights into spatial variations.

Granular Data: For distribution feeders, electrification demand, and DER output, granular data will enable better forecasts and serve as a foundation for time-series analysis. Crucial data sources include SCADA, feeder-level electrification technology adoption information (EVs and heat pumps), electrification technology demand profiles, DER production profiles, and DER interconnection queues. Standardization of this data will make it more usable for utilities and other planning organizations.

8.4.5.2 System Modeling and Identifying Grid Needs

Versant's system modeling process established a strong analytical foundation for assessing system performance under future conditions. The approach leveraged detailed distribution and transmission models, scenario-based analysis, and powerflow studies to identify potential thermal overloads and voltage issues due to growth in electrification demand and DER output. Versant notes several improvement opportunities that will shape future iterations of the IGP.

Scenario Selection: Focusing on peak and minimum load conditions provided robust boundary-case insights, but additional scenarios may help address uncertainty and long-term risk.

Location Precision: Uncertainty in future DER placement and load allocation highlights the need for more granular time-series datasets and improved spatial forecasting.

Program Integration: Asset health, outage management, and resilience considerations could be incorporated into a future modeling framework.

Tool Capabilities: Future planning tools could incorporate multi-scenario analysis, reduce manual effort and increase efficiency.

8.4.5.3 Solutions Identification and Evaluation

Solutions identification and evaluation followed a structured, transparent process for translating grid needs into solutions that could be compared using the MPUC's IGP priorities and evaluation scorecard. Through the process of identifying more than 100 targeted solutions, Versant identified several areas to improve in future IGP iterations.

Evaluation Criteria and Metrics: The absence of standardized definitions for scorecard categories (cost, technical performance, equity, policy alignment) required significant interpretation. Future iterations could further explore how IGP priorities can be defined and measured so that they can be applied to solutions of various types.

Weighting Priorities: Balancing affordability, reliability, equity, and climate objectives without established weighting methods is challenging. Formalizing weighting approaches through stakeholder engagement will be critical for improving transparency and comparability.

“No Regrets” Investments: Many projects offer benefits for more than one investment objective. An example is an infrastructure upgrade to increase electrification capacity while also addressing an asset health need. The IGP should consider benefits over the long term to ensure best value for stakeholders.

Overall, the process established a repeatable foundation for solution evaluation but underscored the need for clearer definitions, standardized scoring, improved modeling capabilities, and advanced tools to support multi-objective, portfolio-level planning. These enhancements will strengthen transparency, equity, and cost-effectiveness in future IGP iterations.

APPENDIX

The following documents are provided as appendices to the Versant IGP:

A. Milestone Meeting Presentations

B. Detailed Feeder Level Forecasts

C. Scorecard Results

D. Versant Feeders and Substations EEEJ Scores

E. Planned T&D Projects