Consolidated Edison

Distributed System Implementation Plan

June 30, 2023

conEdison

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Figures and tables

LIST OF ACRONYMS

- A/C – Air Conditioning
- ADMS – Advanced Distribution Management System
- AMEEP – Affordable Multifamily Energy Efficiency Program
- AMI – Advanced Metering Infrastructure
- API – Application Program Interface
- AREGCBA – Accelerated Renewable Energy Growth and Community Benefit Act
- ASHP – Air Source Heat Pump
- AHJ – Authorities Having Jurisdiction
- AI – Artificial Intelligence
- Auto-DLM – Auto Dynamic Load Management
- BCA – Benefit Cost Analysis
- BD – Business Days
- BESS – Battery Energy Storage System
- BIR – Business Incentive Rate
- BQDM – Brooklyn Queens Demand Management
- BTM – Behind-the-Meter
- C&I – Commercial and Industrial
- CAGR – Compound Annual Growth Rate
- CCA – Community Choice Aggregation
- ccASHP – cold climate Air Source Heat Pump
- CCE – Customer Clean Energy
- ccGSHP – cold climate Ground Source Heat Pump
- CCWG – Customer Consent Working Group
- CDG – Community Distributed Generation
- CEB – Clean Energy Business
- CECONY – Consolidated Edison Company of New York
- CEI – Consolidated Edison, Inc.
- CES – Customer Energy Solutions
- CESIR – Coordinated Electric System Interconnection Review
- CFM – Continuity Funding Mechanism
- CGPP – Coordinated Grid Planning Process
- CHP – Combined Heat and Power
- CIS – Customer Information System
- CLCPA – Climate Leadership and Community Protection Act
- CMCP – Commercial Managed Charging Program
- COF – Certificate of Fitness
- COVID-19 – Coronavirus Disease-2019
- CPM – Customer Project Manager
- CSRP – Commercial System Relief Program
- CSS – Customer Service System
- CUNY – City University of New York
- CVO – Conservation Voltage Optimization
- DAF – Data Access Framework

- DAC – Disadvantaged Community
- DCFC – Direct-Current Fast Charger
- DCX – Digital Customer Experience
- DEC – Department of Environmental Conservation
- DER – Distributed Energy Resources
- DERMS – DER Management System
- DG – Distributed Generation
- DLRP – Distribution Load Relief Program
- DOB – Department of Buildings
- DOT – Department of Transportation
- DPS – Department of Public Service
- DR – Demand Response
- DRC – Data Ready Certification
- DRIVE – Distribution Resource Integration and Value Estimation
- DRMS – Demand Response Management System
- DSA – Data Security Agreement
- DSIP – Distributed System Implementation Plan
- DSM – Demand-Side Management
- DSP – Distributed System Platform
- EDAP – Enterprise Data Analytics Platform
- EDI – Electronic Data Interchange
- EE – Energy Efficiency
- EEB – Energy Efficiency Benchmarking
- EEDM – Energy Efficiency and Demand Management
- eGIS – Enterprise Global Information System
- EIAT – Electronic Infrastructure Assessment Tool
- ELRP – Electric Long-Range Plan
- EM&V – Evaluation, Measurement and Verification
- EMES – E-Mobility Enterprise System
- EoH – Electrification of Heating
- EoNH – Electrification of Non-Heating
- EPA – Environmental Protection Agency
- EPCM – Engineering, Procurement, Construction, and Maintenance
- EPRI – Electric Power Research Institute
- ESCO – Energy Service Company
- ESE – Energy Service Entities
- ESR – Energy Storage Resource
- ESS – Energy Storage System
- EV – Electric Vehicle
- EVSE – Electric Vehicle Supply Equipment
- FAQ – Frequently Asked Questions
- FDNY – Fire Department of the City of New York
- FERC – Federal Energy Regulatory Commission
- FTM – Front-of-the-Meter
- GBC – Green Button Connect

- GBD – Green Button Download
- GHG – Greenhouse Gas
- GIS – Geographic Information System
- GSHP – Ground Source Heat Pump
- HCA – Hosting Capacity Analysis
- HER – Home Energy Report
- HPWH – Heat Pump Water Heater
- HVAC – Heating, Ventilation, and Air Conditioning
- ICAP – Installed Capacity
- IEEE – Institute of Electrical and Electronics Engineers
- IEDR – Integrated Energy Data Resource
- IIJA – Infrastructure Investment and Jobs Act
- IOAP – Interconnection Online Application Portal
- IOU – Investor-Owned Utilities
- IPV – Initial Public Version
- IPWG – Interconnection Policy Working Group
- IRA – Inflation Reduction Act
- ISO – Independent System Operator
- ISWG – Information Sharing Working Group
- ITWG – Interconnection Technical Working Group
- JMC – Joint Management Committee
- JU – Joint Utilities
- L2 – Level 2
- LDV – Light-duty vehicle
- LED – Light Emitting Diode
- LL – Local Law
- LMI – Low- and Moderate-Income
- LSRV – Locational System Relief Value
- LT&D – Local Transmission and Distribution
- LWG – Legal Working Group
- M&C – Monitoring and Control
- M&S – Main and Service
- MCOS – Marginal Cost of Service
- MDMS – Meter Data Management System
- MF – Multifamily
- MHDV – Medium- or heavy-duty vehicles
- MMBtu – Million British Thermal Units
- MNPR – Modernized Network Protector Relays
- MOU – Memorandum of Understanding
- MRP – Make-Ready Program
- MTA – Metropolitan Transportation Authority
- MVP – Minimum Viable Product
- NEM – Net Energy Metering
- NENY – New Efficiency New York
- NEVI – National Electric Vehicle Infrastructure

- NGD – Natural Gas Detector
- NREL – National Renewable Energy Laboratory
- NRI – Network Reliability Index
- NWS – Non-Wires Solution
- NY-BEST – New York Battery and Energy Storage Technology Consortium
- NYC HPD – New York City Housing Preservation and Development
- NYISO – New York Independent System Operator
- NYPA – New York Power Authority
- NYSERDA – New York State Energy Research and Development Authority
- O&R – Orange and Rockland Utilities, Inc.
- OADR – OpenADR
- OMS – Outage Management System
- OSW – Offshore Wind
- PII – Personally Identifiable Information
- POC – Proof of Concept
- PPI – Per Plug Incentive
- PSL – Public Service Law
- PSC – Public Service Commission
- PV – Photovoltaic
- PVL – Poly-Voltage Load Flow
- QA/QC – Quality assurance / quality control
- REST API – Representational State Transfer Application Program Interface
- REV – Reforming the Energy Vision
- RFI – Request for Information
- RFP – Request for Proposals
- RLT – REV Leadership Team
- RMS – Remote Monitoring System
- RPC – Regulatory Policy Committee
- RTEM – Real-Time Energy Management
- RTO – Regional Transmission Organization
- SATA – Storage as a Transmission Asset
- SCADA – Supervisory Control and Data Acquisition
- SCNY – SmartCharge New York
- SCT – Societal Cost Test
- SD-WAN – Software-Defined Wide Area Network
- SEP – Strategic Energy Partnership
- SIR – Standardized Interconnection Requirements
- SMB – Small and Medium Business
- SME – Subject Matter Expert
- T&C – Terms and Conditions
- T&D – Transmission and Distribution
- TBtu – Trillion British Thermal Units
- TCO – Total Cost of Ownership
- TDM – Targeted Demand Management
- Term-DLM – Term Dynamic Load Management

- TLC – Training and Learning Center
- TOU – Time-of-Use
- UAT – User Acceptance Testing
- UBP-DERS – Uniform Business Practices for DERS
- UCG – Utility Coordination Group
- UDR – Utility Data Requirements
- UER – Utility Energy Registry
- UL – Underwriters Laboratories
- UTEN – Utility Thermal Energy Network
- V2G – Vehicle-to-Grid
- VDER – Value of DER
- VFD – Variable Frequency Drive
- VVO – Volt/VAR Optimization
- WAP – Weather-adjusted peak
- WVS – Wholesale Value Stack
- ZEV – Zero Emission Vehicle

EXECUTIVE SUMMARY

Consolidated Edison Company of New York, Inc. ("Con Edison" or "Company") is excited to present its fourth Distributed System Implementation Plan ("DSIP") to increase customer choice and promote a sustainable and clean energy future. This DSIP supports New York State's clean energy goals as outlined under the nation-leading 2019 Climate Leadership and Community Protection Act ("CLCPA") and further articulated in the 2022 Scoping Plan.[1] The CLCPA reflects the Company's commitment to furthering the State's vision by:

- Reducing customer energy usage by 185 trillion British thermal units ("TBtu") by 2025;
- Transforming the energy supply to provide 100 percent zero-emissions electricity by 2040;
- Leading New York to net-zero greenhouse gas ("GHG") emissions by 2050;
- Electrifying the transportation sector and two million homes by 2030;
- Installing 6,000 MW of distributed solar by 2025, 6,000 MW of energy storage by 2030, and 9,000 MW of offshore wind ("OSW") by 2035; and
- Delivering a just transition with clean energy benefits provided to low- and moderate-income ("LMI") and disadvantaged communities ("DAC").

As the planner, builder, and operator of an increasingly sophisticated and complex electric system, Con Edison is developing the people, processes, and systems necessary for a reliable, resilient, and increasingly dynamic grid. The Company's investments in recent years have helped provide the foundation for a more flexible system that can effectively integrate a significant increase in renewable energy, including DER and other renewables.[2] Many of these investments provide multiple customer benefits, including simultaneously supporting decarbonization, increasing resiliency to extreme weather events and climate change, growing DER adoption, and improving the customer experience. While the DSIP focuses on the electric distribution system, the Company also recognizes the role distribution planning plays in coordination with the bulk power system. The Company's focus on coordinated planning, both through the Coordinated Grid Planning Process ("CGPP") and in facilitating wholesale market participation of distribution connected resources, are also detailed in this filing.

The plans detailed in this DSIP align with the Company's Electric Long-Range Plan,[3] which outlines how Con Edison designs and invests in the electric grid to create a sustainable energy future.[4] The Company continues to deliver power with world-class reliability, safety, and security in an evolving environment. Changes to customer expectations, the climate, clean energy legislation, technological advancement, and a focus on equity and environmental justice propel this evolution.

Con Edison remains committed to meeting the challenges of the State's nation-leading clean energy policy goals as a next-generation clean energy leader. The Company recognizes that the future electric grid will leverage and accommodate dynamic, innovative, resilient, and scalable solutions that provide abundant clean energy choices for a carbon-free future. The Company will continue to use the DSIP to engage the stakeholder community on the processes and programs that inevitably shape the Distributed System Platform ("DSP").

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[1] New York State Climate Action Council, *New York State Climate Action Council Scoping Plan* (December 2022): https://climate.ny.gov/resources/scoping-plan/.

[2] For purposes of this filing, DER is defined as end-use energy efficiency ("EE"), demand response ("DR"), distributed storage, and distributed generation ("DG").

[3] Con Edison Electric Long Range Plan (January 2022): https://www.coned.com/-/media/files/coned/documents/our-energy-future/our-energy-projects/electric-long-range-plan.pdf.

[4] *Ibid*.

Diversification of Energy Efficiency ("EE")

Energy Efficiency remains a critical building block of reducing energy usage and greening the grid, and Con Edison has been an industry leader for over a decade. Con Edison offers a broad array of EE initiatives designed to reduce GHG emissions, lower customer bills, and give New Yorkers control over their energy choices. The Company is driving increased peak savings from its EE and demand management ("DM") programs, contributing to over 901,000 MWh of electrical usage savings in 2022 alone – the equivalent of taking nearly 100,000 cars off the road or powering over 58,000 homes for a year.[5] The Company also had a robust market response to the launch of its Clean Heat Program, and is currently exceeding its cumulative New Efficiency: New York ("NENY") savings goal.[6]

Energy Efficiency Priorities

- *Pursuing deeper and more sustainable measures.*
- *Expanding programs that support LMI and DAC.*
- *Encouraging innovation and flexibility in program design.*
- *Collaborating with state entities to increase the size and technical competence of the electrification workforce.*

Looking to the future, the Company will continue to pursue innovation in program design and execution, targeting deeper and more sustainable energy savings measures over lighting and gas appliance upgrades, with the foremost goal of a clean energy future for New York. This includes, but is not limited to, building envelope upgrades, heating electrification, and a suite of prescriptive and custom EE programs and pilots. Additionally, the Company is pursuing electrification workforce development collaboration with State entities, including the New York State Energy Research and Development Authority ("NYSERDA"). Utility actions will continue to facilitate the growth in EE and building electrification through utility programs and by enabling the development of a robust, dynamic marketplace for third party EE products and services.

DER Growth and Market Enablement

Con Edison has made considerable strides in advancing the State's clean energy policy goals and building the capabilities for a DSP that supports greater DER adoption. Improvements to the interconnection process have adjusted the screens to advance to interconnection quickly or inform a detailed study. Reporting and data provisions have also provided developers with additional transparency regarding the interconnection process. Also, through working with stakeholders and the Interconnection Policy Working Group ("IPWG"), the Company proposed an industry-leading cost-sharing methodology to reduce the financial burden imposed on "first-mover" projects. These improvements have enabled the Company to interconnect 500 MW of distribution-connected solar capacity as of March 2023, supporting the State's 10 GW goal by 2030. Con Edison has also interconnected 499 customer energy storage system ("ESS") projects, totaling 24.9 MW of capacity. The Company works closely with the Joint Utilities[7] ("JU"), State entities, and stakeholders to consistently adapt the interconnection process to accommodate new technologies and configurations supporting the influx of DER.

Con Edison is enabling market growth by expanding opportunities for DER to provide and be compensated for grid services. For example, the Company continues to successfully implement and operate portfolios of non-wires solutions

[5] Con Edison, Advancements in Energy Efficiency, Renewables, and Distributed Energy: https://lite.conedison.com/ehs/2022-sustainability-report/clean-energy-transition/advancements-in-energy-efficiency-renewables-distributed-energy/.
[6] Con Edison has exceeded its 2020-2022 cumulative MMBtu NENY savings target by 215 percent.
[7] Central Hudson Gas & Electric Corporation; Consolidated Edison Company of New York, Inc.; Niagara Mohawk Power Corporation d/b/a National Grid; New York State Electric & Gas Corporation; Orange and Rockland Utilities; Inc.; and Rochester Gas and Electric Corporation (collectively, "Joint Utilities").

("NWS") to defer traditional utility infrastructure investments through peak demand-reducing EE, distributed generation ("DG"), and energy storage technologies in the Brooklyn-Queens Demand Management ("BQDM"), Newtown and Water Street Substation Areas. Con Edison has also refined its approach for bringing NWS opportunities to market, releasing a request for proposal ("RFP") for prescriptive energy storage in BQDM in Q2 2022 and for the Jamaica substation area in Q2 2023.

The Company is also enabling DER markets through direct solicitation of resources. After an initial bulk storage solicitation in 2019, the Company has continued to issue RFPs seeking dispatch rights from energy storage projects. Its most recent RFP was in December 2022, targeting at least 200 MW of energy storage with the capability of individual, direct participation in the New York Independent System Operator ("NYISO") market. Con Edison is also building experience installing and operating utility-owned ESS projects in a dense urban environment. These projects provide local grid benefits and participate in markets to offset costs to its customers. Through these projects, Con Edison has developed an industry-leading engineering, procurement, construction, and maintenance ("EPCM") model to harness subject matter expertise and has led first-of-a-kind emergency preparedness drills with multiple city, state, and federal agencies.

Another noteworthy step in market enablement is Con Edison's partnership with the Joint Utilities and the NYISO to launch its DER Aggregator market. The Company worked closely with the Department of Public Service ("DPS" or "Staff") and various stakeholders leading up to the market launch at the end of April 2023. The NYISO's implementation of a DER Aggregator model will enable wholesale participation for DER and will provide the foundation for market services envisioned in Federal Energy Regulatory Commission ("FERC") Orders 841 and 2222. To support this market launch, Con Edison proposed revisions to its retail tariffs, which were approved by the Public Service Commission ("PSC or Commission") in early 2023, and plans to file proposed changes to its existing Wholesale Distribution Service ("WDS") tariff with the FERC in mid-2023. Con Edison will play an active role in registering and validating DER participants and developing the necessary monitoring and control ("M&C") technologies for secure, reliable, scalable, and cost-effective operations. The Company tested a Software-Defined Wide Area Network ("SD-WAN") solution which will be available to NYISO market participants in 2023 and lower barriers to entry. Con Edison is the first utility in the State that will offer a lower-cost telemetry solution.

Enhanced Customer Engagement Tools and Strategies

Con Edison is continuously looking for ways to work with its customers, including LMI customers, and provide solutions to their energy needs. For example, in collaboration and coordination with NYSERDA, Con Edison continues to invest and create an LMI portfolio of EE programs designed to bolster engagement and deliver EE and associated bill savings to LMI customers and communities. Through its 2022 LMI programs, Con Edison provided 15,273 MWh of electric savings, distributed 11,448 EE kits, and collaborated with food pantries to distribute 62,544 packs of light emitting diode ("LED") lighting.

A primary channel through which Con Edison communicates with its customers is the monthly bill. The launch of a new Customer Service System ("CSS") later this year will provide automation capabilities that enhance the customer experience and provide smoother billing and compensation transactions. The Company is committed to providing customers with the information, education, and tools to make more informed energy decisions, as well as exploring new ways to meet and exceed customer expectations.

The Company is also evolving and expanding its customer programs to promote heat pumps through the New York State ("NYS") Clean Heat Program, driving increased program support and incorporating program best practices to increase customer participation and achieve energy savings. As part of the NENY Proceeding, the Commission established a goal

to reduce 3.6 TBtu through heat pump deployment. Since the 2020 launch of its Clean Heat Program, the Company has realized 2.15 TBtu of energy savings, electrifying over 34,000 dwelling units.

Customer adoption of electric vehicles ("EVs") introduced a new facet in the utility-customer relationship. Con Edison continues to implement a multi-faceted approach to support EV customers, including charging infrastructure development, operating cost relief, fleet support, and resource information. The successful launch of the Company's PowerReady Make-Ready Program ("MRP") has led to the installation of over 3,700 Level 2 ("L2") chargers and 1,750 DC Fast Chargers ("DCFC"). The Company plans to install a total of 18,539 L2 charging plugs and 457 DCFC charging plugs for light-duty vehicles ("LDVs"), such as cars and small vans, by 2025 through the MRP, with the potential for a significant increase in charging plug targets under the program Midpoint Review underway in 2022-2023. Operating cost relief is provided through programs like SmartCharge New York ("SCNY"), which incentivizes grid-beneficial charging behavior with bill credits and EV-specific rate designs for residential customers. From a fleet perspective, the Company offers a fleet assessment service to advise fleet operators on site feasibility and electric fueling costs as well as evaluate grid infrastructure needs. Finally, the Company provides a centralized repository for EV-related programs for customers, developers, and fleet owners and operators on its website,[8] which includes a rate calculator, details on available incentives, a dashboard with program status, and instructions on program enrolment. Collectively, the Company's managed charging and upfront installation incentives support the State's policy goal of 850,000 zero-emission vehicles ("ZEV") by 2025.

The full-scale deployment of smart meters also creates new opportunities to engage customers by expanding tools to increase energy awareness and promote market development. As of May 1, 2023, Con Edison has installed over 4.7 million smart meters in its service territory, representing over 98 percent of total deployment. The meters will serve as the backbone of future digital advances for the Company's energy systems and help customers reduce energy use and save money. This will also enable the Company to operate the grid more efficiently, more easily integrate energy produced within the distribution system, and lower operating costs.

Expanded Data Sharing

Since 2021, Con Edison has actively worked with NYSERDA, stakeholders, DPS Staff, and the Commission to investigate more efficient and robust means of exchanging useful energy data through the Integrated Energy Data Resource ("IEDR") and Data Access Framework ("DAF") efforts. The IEDR is a single statewide platform that securely collects and integrates utility and energy-related data to support New York's clean energy goals. The DAF will standardize data security and quality standards. In collaboration with the Joint Utilities, the IEDR Program Team, and NYSERDA, the Initial Public Version[9] ("IPV") was launched on March 31, 2023 – the first phase of supporting new and innovative clean energy business models that will ultimately serve energy customers across New York State. The Company now looks forward to developing the Minimum Viable Product ("MVP") portion of the IEDR Phase 1, consisting of five additional use cases targeted for deployment in Q4 2023.

IPV USE CASES

- *Installed DERs*
- *Planned DERs*
- *Consolidated Hosting Capacity Maps*

MVP USE CASES

- *DER Siting*
- *Enhanced Hosting Capacity and DER Maps*
- *New York State Customer Billing Data*
- *New York State Rates and Tariff Data*

[8] Con Edison EV website: https://www.coned.com/en/our-energy-future/electric-vehicles.
[9] New York State's Integrated Energy Data Resource (IEDR)-Initial Public Version landing page: https://iedr.nyserda.ny.gov/.

The Company also released a host of enhancements to its platforms that support customer data sharing, including Share My Data under Green Button Connect ("GBC"), allowing customers to share data with DER providers and continue promoting customer choice. Share My Data serves as a vehicle for customers to provide registered third parties with access to their energy and account data. The Company has maintained consistent annual updates to the platform, expanding datasets available to registered third parties. Con Edison also incorporated building benchmarking enhancements under its EE Benchmarking ("EEB") portal for its 2023 Season, including data quality improvements.

Con Edison also enhanced the distribution system data provided through its hosting capacity maps. The hosting capacity maps includes valuable data on system characteristics to give developers further insight into business opportunities such as energy storage, PV, and EV charging at different points on the grid. In April 2023, the Company released its second tranche of updates, adding functionality for sub-feeder level data, DG connected since the last refresh, and nodal constraints for solar photovoltaic ("PV") and storage maps. Con Edison will continue collaborating with the Joint Utilities to improve data access and visualization, drawing on feedback from stakeholders.

Modernization of the Grid

CLCPA goals, electrification of transportation and building sectors, and the Company's Climate Vulnerability Study findings necessitate modernization and expansion of the electric grid.[10] The Vulnerability Study identified potential risks from heat, flooding, and extreme and multi-hazard events, and proposed operational, planning, and design mitigation actions. These actions complement and build on the extensive investments in system hardening and resiliency the Company made post-Hurricane Sandy. Investments to this end include multi-value transmission projects that provide capacity to accommodate renewable generation and support grid reliability, adding new capabilities to the distribution grid, and expanding the role of third party projects and resources. The energy system transformation envisioned by the CLCPA elevates the role of the DSP as a foundation of a reliable and resilient grid that streamlines interconnection and integration of DER at the distribution level.

The Company is making steady progress in executing its Grid Modernization Plan and creating a modern grid that is flexible, resilient, and agile in the face of changing climate and industry trends. For example, the continued deployment of advanced relays and telemetry in the underground system facilitates two-way power flows and improves local hosting capacity. Additionally, the ongoing implementation of an Enterprise Geographic Information System ("eGIS") is a foundational component of a DER management system ("DERMS"). The GIS will offer one consolidated mapping and visualization system that stores the physical location and other operating characteristics of facilities and assets, including DER, and maintains the as-built model of the electric and gas distribution systems. It will also be the backbone for the connectivity model that shares information and provides feedback across the grid. The Company has recently completed a proof of concept ("POC") for its DERMS and is implementing an enterprise DERMS in phases over the next three years, starting with DER data and data management, then progressing to planning, forecasting, and M&C functions.

Coordinated Planning for Electrification and Clean Energy

Preparing for the scale of the changes needed to transform the energy supply mix and decarbonize the transportation and building sectors requires careful consideration of utility forecasting and planning practices. Resources and new loads connected to the distribution system can have upstream impacts on the bulk power system, at a pace that challenges traditional planning cycles. Con Edison is preparing for these changes through a multi-faceted approach that leverages the Company's longstanding role as the grid operator accountable for the provision of reliable electric service in its territory. The CGPP proposal recognizes the link between transmission and distribution ("T&D") planning. Coordinated

[10] Con Edison Climate Change Resiliency Plan website: https://www.coned.com/en/our-energy-future/our-energy-vision/storm-hardening-enhancement-plan.

planning will continue to evaluate investments holistically to identify key electric grid expansions that fulfill reliability needs while also unlocking renewable generation capacity. A prime example is the Brooklyn Clean Energy Hub, which delivers immediate reliability benefits and serves as a potential future point of interconnection for up to 6,000 MW of offshore wind.

To support rapid electrification, the Company is leveraging its advanced metering infrastructure ("AMI") data, programs like SCNY, and demonstration projects to understand customer behavior and define load shapes for EV charging and clean heat. Con Edison designs programs, like the MRP, to facilitate and incentivize infrastructure development to expand the grid. The need for localized infrastructure could also be an acute issue with medium- and heavy-duty ("MHDV") vehicles. The Company supports the 2023 proceeding[11] initiated to establish a process for proactive investment in utility infrastructure to support these MW-scale loads.

Ongoing Stakeholder Outreach

Con Edison continues to collaborate with the Joint Utilities, stakeholders, and state entities through working groups and targeted meetings to solicit and incorporate continuous feedback on energy-related policies and processes. The Company recognizes that robust stakeholder engagement remains a crucial tenet in delivering New York's key clean energy policy goals. Comprehensive engagement across customers, developers, and installation contractors alike will better enable the carbon-free future envisioned by the State.

The Company also communicates with stakeholders through multiple channels, such as technical conferences, newsletters, and webinars. The Company actively participates in developing the quarterly DSP Enablement Newsletter[12] with the Joint Utilities to provide stakeholders with relevant updates and source material related to the DSIP five-year plans. The Joint Utilities' website is also continually updated with new resources, including regulatory filings and newsletters, and important stakeholder meeting information. As with previous DSIPs, the Company will partner with Orange and Rockland ("O&R") to present their respective DSIPs.

Conclusion

New York State is transforming its energy sector. Electric utilities are being called on to deliver greater choice and value to customers through a cleaner, more modern grid that accommodates and leverages an increasingly diverse resource mix. Con Edison supports the State's ambitious clean energy goals and looks forward to helping lead this groundbreaking effort, including collaborating with stakeholders to achieve the CLCPA goals.

Co Edison's DSIP is a practical, actionable, and evolving plan to enhance existing capabilities and develop new tools and processes. The plan draws from ongoing collaboration with the Joint Utilities, including continued development of common standards, protocols, and processes that will support statewide markets and allow for greater convergence of capabilities over time. Con Edison welcomes the opportunity to share this plan with stakeholders, work collaboratively to implement it, and continue supporting the State's transition to a clean energy future.

[11] Case 23-E-0070, *Proceeding on Motion of the Commission to Address Barriers to Medium- and Heavy-Duty Electric Vehicle Charging Infrastructure* ("MHV Proceeding"), Order Instituting Proceeding and Soliciting Comments (issued April 20, 2023).
[12] Joint Utilities of New York Current Stakeholder Information ("DSP Enablement Newsletter") landing page: https://jointutilitiesofny.org/about/stakeholder-information.

1. PROGRESSING THE DSP

1.1. INTRODUCTION

This is Con Edison's fourth DSIP and the second following the passage of the CLCPA,[13] which represents a significant expansion and acceleration of New York State's clean energy goals. The CLCPA sets the vision of net zero GHG emissions across all sectors within the next thirty years, including 70 percent renewable energy by 2030 and a 100 percent carbon neutral electric system by 2040. While beyond the five-year horizon of the DSIP, these goals require a reassessment of current efforts to ensure alignment with the CLCPA goals. The Company's foresight, driven by its support of clean energy objectives in combination with efforts to develop DSP capabilities, position it well to integrate increasing amounts of DER and clean energy resources, operate a more dynamic and flexible grid dominated by renewable energy, and enhance the customer experience.

This DSIP highlights major accomplishments since the June 2020 DSIP and outlines the actions planned over the next five years to further develop the DSP in line with REV objectives and State policy goals. As discussed throughout the filing, the Company has sustained momentum and made additional progress in evolving the people, processes, and systems that underpin the DSP and adding new capabilities, particularly in DER integration. The Company will build on this progress over the next five years to further prepare for a decarbonized system that is resilient, reliable, and responsive to customer needs.

This filing presents Con Edison's overarching approach to enhancing DSP capabilities and responds to the DPS Staff whitepaper ("2023 DSIP Guidance"),[14] which clarifies the purpose of the DSIP filings and outlines the required contents. As stated in the 2023 DSIP Guidance, the purpose of the filing is to:

(1) Report on the utility's DSP implementation progress.
(2) Describe in detail the utility's plans for implementing DSP-related policies, processes, resources, and standards, including any plans from the CGPP that may be relevant to the DSP.
(3) Identify and describe how to access the tools and information, including the new statewide Integrated Energy Data Resource ("IEDR") Platform, that can be used by DER developers and other third parties to help them understand utility system needs and potential business opportunities.
(4) Describe how the utility's DSP implementation efforts are organized and managed.[15]

The Company developed this DSIP with these objectives in mind. Because previous DSIPs provided a significant amount of background information on current practices and capabilities, this DSIP focuses on subsequent actions and results, with the aim of creating a useful reference guide to ongoing and future utility actions.

The DSIP is organized around the topics and outline of the 2023 DSIP Guidance. For each topic section, the DSIP provides general context and background information to orient the reader and presents an overview of achievements since the Initial DSIP and planned future actions. Each topic section also discusses implementation risks and the interface with stakeholders. These introductory sections are followed by responses to the itemized questions in the 2023 DSIP Guidance. To support information sharing while managing the volume of information provided in this DSIP, Con Edison directs readers, where applicable, to resources for additional information in **Appendix C**.

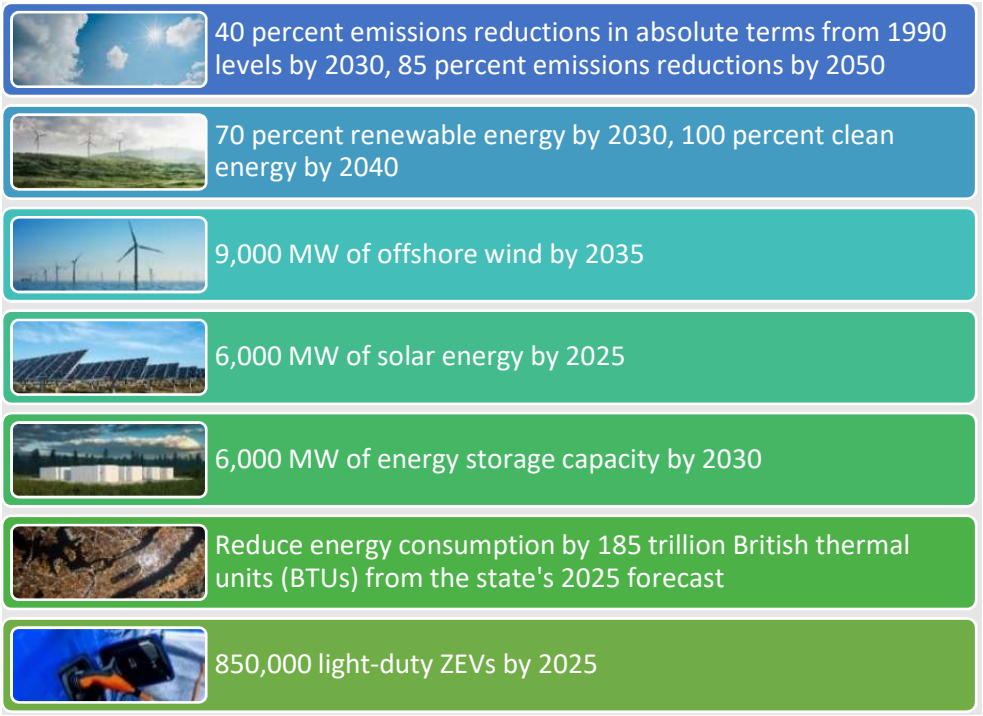
[13] CLCPA is available at: https://legislation.nysenate.gov/pdf/bills/2019/S6599.
[14] Case 16-M-0411, *In the Matter of Distributed System Implementation Plans* ("DSIP Proceeding"), DPS Staff Whitepaper: Proposed Commission Guidance for the Electric Utilities' 2023 DSIP Update Filings ("2023 DSIP Guidance") (issued January 10, 2023).
[15] *Ibid*., p. 5.

1.2. LONG-TERM VISION FOR THE DSP

Summary

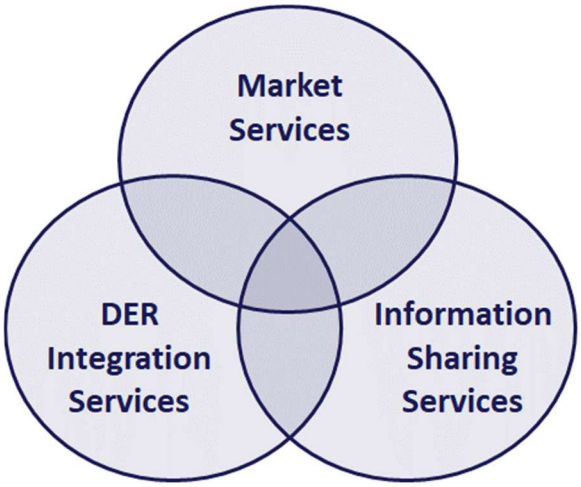
Since the 2020 DSIP, the policy focus in New York has continued to emphasize implementing the CLCPA and integrating clean energy resources into the distribution and bulk electric system. The Accelerated Renewable Energy Growth and Community Benefit Act ("AREGCBA") has changed the utilities' roles in coordinated system planning and investment, and the Commission has directed the JU to undertake planning assessments and propose investments to facilitate the cost-effective development of renewable and emission-free resources while maintaining the State's electric grid reliability. The JU's CGPP proposal is an important effort to integrate the planning processes for the distribution and bulk power systems. Additionally, the accelerating adoption of EVs and legislation prohibiting natural gas-powered stoves and appliances will increase demand for electricity and change patterns of energy consumption. These trends heighten the importance of the DSP in planning and operating the grid safely and reliably while facilitating the State's policy goals.

Figure 1: Summary of CLCPA Goals Plus Zero Emission Vehicle Regulation Targets



Amidst this evolving policy landscape, Con Edison's vision for the DSP remains focused on the three core functions of DER integration, information sharing, and market services. The Company's investments in clean energy and distribution system technologies can empower communities and customers to actively participate in, and realize the benefits of, the clean energy transition. Realizing this vision, while promoting the State's clean energy goals, will require multifaceted investments across the Company. A high-level overview of these investments is available in **Figure 2**.

Figure 2: Core DSP Functions



DER Integration: Delivering Benefits of Planning and Operational Investments that Streamline DER Interconnection, Coordinate with the Bulk System Planning, and Prepare the Grid for Electrification

Con Edison's vision for this DSP function is to seamlessly integrate DER into its electric distribution system and continue evolving planning processes to preserve system safety and reliability. Seamless integration of DER will continue to focus on enhancements to the interconnection process and hosting capacity maps, as well as systems and processes for operating in a high-DER environment. Updates to planning processes will more tightly integrate distribution and bulk power system planning and prepare for electrification of buildings and transportation.

Con Edison has continued enhancing the DER interconnection process for faster approval and to provide tailored requirements to specific DER types and locations. Through these efforts, the JU have collaborated with industry stakeholders on a comprehensive Coordinated Electric System Interconnection Review ("CESIR") evaluation, developed a smart inverter roadmap that includes bulk power support and voltage support settings, and developed and proposed storage metering architectures for various technology configurations.

Continued enhancements to the hosting capacity maps also benefit customers interconnecting DER. Providing additional functionality and insight for DER developers helps them make efficient decisions that maximize system benefits. Since 2020, Con Edison has made multiple enhancements to the maps including criteria violations and nodal level hosting capacity.

Con Edison has also made significant progress in integrating DER into operational processes. The Company envisions a more dynamic distribution system, where operators can eliminate local constraints with company assets or DER. The Company is preparing for a future in which it operates its utility assets alongside operational control or price-signaled dispatch of DER. The Joint Utilities continue to take steps to prepare for this by analyzing M&C protocols and systems, developing new monitoring parameters, and coordinating with the NYISO to define operational coordination processes needed to facilitate DER wholesale market participation. The Company's Demand Response Management System ("DRMS") has enabled automated dynamic load management dispatch and incentive payment calculation and settlement for aggregators. The enterprise DERMS will further augment planning and operational capabilities in the coming years.

CLCPA places an increased emphasis on large-scale renewables, beneficial electrification, and serving DACs. The Company's vision for planning is adapting accordingly, including robust stakeholder engagement. The CGPP proposal that the JU developed was informed by the input of stakeholders in a series of nine technical conferences. As a result,

the bulk and local transmission and distribution ("LT&D") projects used the best data available and refined modeling approaches. The JU expect to fulfill the goals of the CGPP in an iterative process of improvement and refinement, including through continued opportunities for stakeholder input and discussion, similar to the ongoing development of the DSP. The Company has worked to align the CGPP and DSIP processes accordingly, with the forecast assumptions reflected in this DSIP mirroring those used in the CGPP, and with future CGPP forecasts and projects integrated in future DSP planning activities.

Recent years have directed an additional New York policy focus on electrification and shaped the utility role in enabling a broader transition to electric transportation. There has been a record increase in the number of EVs sold, bringing the total number on the road to approximately 139,000 to date. There are now over 10,000 charging stations across the State. The Company looks forward to pursuing proactive measures to increase grid capacity where charging infrastructure and building electrification strains local infrastructure.

In addition to investments and revised planning processes, the JU are also addressing other important aspects of transportation electrification, like load management and rate design. Developing load management programs, like the residential and commercial managed charging programs ("CMCP") is central to maintaining reliability and controlling costs as EV adoption scales. Rate design is another tool to encourage EV adoption and encourage grid beneficial charging behavior. The Joint Utilities are exploring rate designs that send price signals to customers for efficient grid operation. Rate design is also a key mechanism to mitigate the impact of demand charges for low load factor charging stations that can impact the cost-effectiveness of EV charging.

Building electrification is also a critical component of the State's ambitious clean energy goals. The CLCPA Scoping Plan calls for 2,000,000 electrified homes state-wide, which translates to 350,000-750,000 dwelling units[16] in Con Edison's service territory. The Company offers incentives for a variety of technologies and sectors through its Clean Heat Program.

The Joint Utilities are championing an equitable transition to electrified transportation and heating by supporting investments that benefit DACs. Disadvantaged communities bear heavy burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria or comprise high concentrations of low- and moderate-income ("LMI") households. Of the $701 million for the EV MRP, $206 million directly benefits DACs. Additionally, the JU and NYSERDA launched the Affordable Multifamily Energy Efficiency Program ("AMEEP") in 2021 to help LMI customers participate in the clean energy transition.

Information Sharing: Delivering Useful, Market-Enabling Information that Enhances Customer Value, Now Through a Statewide System

The vision for the information sharing function of the DSP is to provide systems that measure, collect, analyze, manage, and display granular customer and system data to help customers and other market participants make informed decisions. An essential part of this function is protecting customer privacy and security, which remains a core Company responsibility and an element of the vision.

The 2020 DSIP emphasized the need for more uniform information access across the New York utilities. Since then, the JU have made substantial progress toward that objective through the inception of the IEDR. As it expands, the IEDR will be an essential tool for promoting a more transparent and data-driven energy system. The IEDR includes comprehensive

[16] Con Edison Heat Pump Program Manual v2 (March 1, 2023), p. 10: Dwelling Unit: "A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation."

data on energy consumption, production, and storage, as well as information on the electric grid, weather, and demographics.

The Company has been an active stakeholder in the IEDR, shaping its development. Con Edison has worked collaboratively with other stakeholders to define and develop use cases for the IEDR. The recent launch of three use cases in the IPV and the expected launch of five more use cases in the MVP later this year, demonstrate the progress the JU and stakeholders have made. The ongoing contribution of data to the IEDR, including information on grid performance, energy usage, and outage data will help inform decision-making related to grid operations, planning, and policy development.

The IEDR and the associated DAF are a key part of the information sharing function. The data, insights, and collaboration with stakeholders will be critical to improving the performance and efficiency of the State's electric grid, and Con Edison is committed to ensuring that the IEDR is used to its full potential.

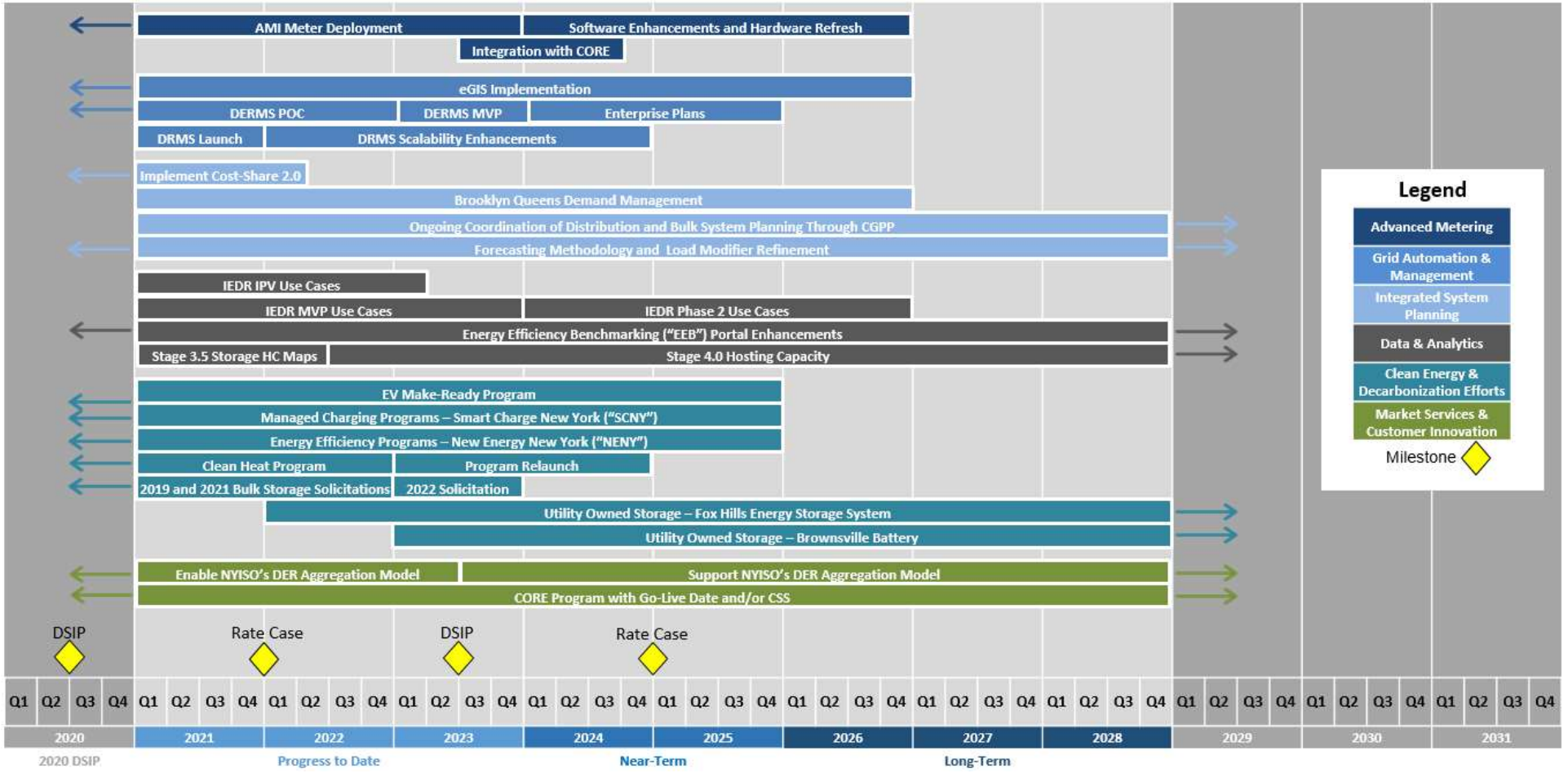
Market Services: Enabling a Robust Marketplace for DER to Access Value at All Levels of the Grid, With a New Avenue at the Wholesale Level

The vision for DSP market services continues to be a future energy marketplace where competitive market signals play a greater role in achieving accurate pricing and compensation for distribution system value. There are several mechanisms for DER compensation, including demand-side management ("DSM") programs, direct contracting with resources (e.g., NWS), and tariff mechanisms (e.g., the Value of DER ("VDER") Value Stack). These align to the three "P's" of incorporating and compensating DER: pricing, programs, and procurement. Each plays an important role in DER adoption. The Company has observed continued or growing participation in all three in the past three years.

A critical step in accelerating progress toward this vision has been achieved by working collaboratively to help the NYISO implement its DER Market Participation Model. Under an initiative to implement the FERC Order 841 and 2222 requirements, the Joint Utilities have been working with the NYISO to develop and support the launch of the DER Market Participation Model. Con Edison has updated its processes and systems to prepare for market launch, including refining the exchange of information related to registration, enrollment, operational coordination, and data exchanges. The Company has also provided input on draft NYISO manual revisions and resolving process concerns. Stakeholders have been involved throughout this work. For instance, in a 2022 stakeholder session with DER community members, the group focused on necessary telemetry requirements for the safe and reliable operation of the distribution grid.

With full FERC 2222 participation not anticipated to begin until 2026, the final role of the NYISO market in DER compensation remains a work in progress. In the coming years, there will be an evolving role for the DSP in market services. This transition will require an increased role for grid modernization technologies and may necessitate further investments in Advanced Distribution Management Systems ("ADMS"), AMI, and grid automation.

Figure 3: Integrated Timeline of Activity and Investments



2. TOPICAL SECTIONS

The 2023 DSIP Guidance directed the utilities to provide "planning and implementation details which will help the utilities and stakeholders align their respective needs and capabilities as the electric system evolves."[17] Staff outlined basic requirements common to each topic and specified detailed questions for each topic. In the following sections, the Company provides the common information and responds to the detailed questions, recognizing that there are some cases where detailed implementation plans are not yet fully developed or where planning efforts are in early stages due to ongoing related proceedings and policy development. In such cases, the Company describes its current status and planned next steps.

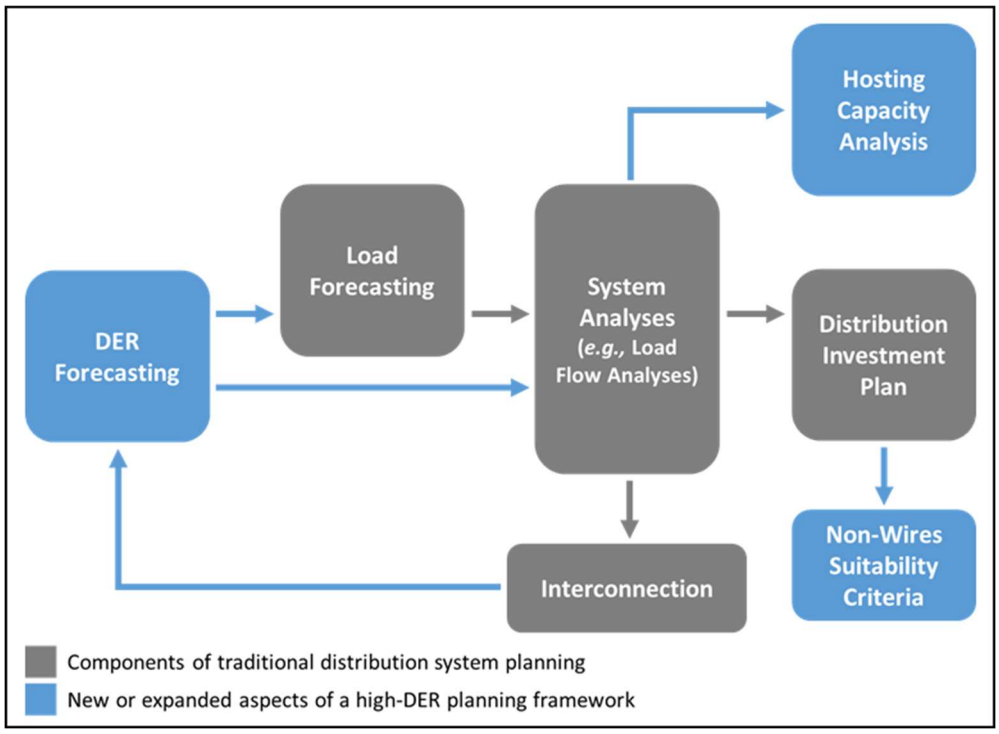
[17] Note 14, *supra*.

2.1. INTEGRATED SYSTEM PLANNING

Context and Background

As described in the Company's 2018 and 2020 DSIPs, the Company has expanded aspects of its planning framework which incorporates a broader range of data drivers, additional sources of uncertainty, and a more diverse resource mix, as shown in Figure 4 below.

Figure 4: Evolving Distribution System Planning Processes[18]



As discussed below and throughout this filing, Con Edison has integrated DERs into its planning and operations to support DER growth, including directing DER to areas of the grid where it can provide the greatest system value through NWS, covered in greater detail in Section 2.13. Additionally, Con Edison continues to improve its hosting capacity maps with more granular data and streamline the interconnection process, which is driving improved customer and developer satisfaction and facilitating greater DER deployment. A complete list of updates to the Company's hosting capacity maps are found in Section 2.9.

In recent years, several critical policies have been established which will fundamentally transform the energy supply mix and the load growth and consumptions patterns. These will increase the importance of integrated system planning across T&D.

Under the CLCPA, two statewide targets for renewable energy sources were set – 70 percent of New York's electricity from renewable energy by 2030 (70x30) and 100 percent by 2040 (100x40).[19] Additionally, the State's efforts to electrify transportation and buildings will increase demand for electricity and change the ways in which it is consumed. The

[18] DSIP Proceeding, Joint Utilities Supplemental Distributed System Implementation Plan ("Supplemental DSIP") (filed November 1, 2016), p. 28.
[19] Note 13, *supra*.

potential for rapid load growth driven by transportation electrification, especially that of MHDVs, are a critical consideration for system planning. The newly created proceeding regarding proactive planning approaches for MHDV charging infrastructure will further inform the Company's planning criteria in the coming years.[20] These topics are explored in greater detail in **Section 2.5** and **Section 2.6**, respectively.

In order to facilitate the goals defined in the CLCPA, NYS enacted the AREGCBA or ("the Act") on April 3, 2020, establishing three pillars aimed at improving the siting and construction of large-scale renewable energy projects in a cost-effective and environmentally beneficial manner. [21] On May 14, 2020, the Commission, directed by the AREGCBA, issued its Order on Transmission Planning Pursuant to the AREGCBA, establishing two key proceedings: (i) a focus on establishing a LT&D capital plan for each utility necessary to achieve CLCPA targets and (ii) a statewide plan to identify and implement transmission-level investments that are "necessary or appropriate to achieve CLCPA targets." [22]

On November 2, 2020, Con Edison and the other JU established a LT&D capital plan for each utility by identifying proposals and recommendations to support the LT&D investment planning process.[23] The JU report identified two categories of LT&D projects based on project readiness and the complexity of the regulatory environment to be resolved. Phase 1 projects were identified as immediately actionable and satisfying reliability, safety, and compliance, but also addressing bottlenecks or constraints that limit renewable energy delivery within the utility's system. Phase 2 projects may increase capacity on the LT&D system to allow for interconnection and delivery of new renewable energy generation resources within the utility's system.

On January 19, 2021, the Department of Public Service ("DPS") Staff and NYSERDA filed the Power Grid Study to identify LT&D upgrades and investments necessary or appropriate to the timely achievement of CLCPA targets.[24] The Power Grid Study consisted of three component studies: (i) the Utility Transmission and Distribution Investment Working Group Study, (ii) the OSW Integration Study, and (iii) the Zero-Emissions Electric Grid in New York by 2040 Study.

The Commission filed two additional orders in response to the Joint Utilities' proposed set of CLCPA LT&D investment and prioritization criteria. The first order (Phase 1 Order), filed on February 11, 2021,[25] provided guidance on Phase 1 projects and deferred action on policy recommendations and Phase 2 projects in the Joint Utilities' LT&D proposal. The second order (Phase 2 Order), filed on September 9, 2021,[26] directed investment criteria to support a more comprehensive Commission review of LT&D project proposals and directed the JU to file a coordinated grid planning proposal. The Joint Utilities filed the initial CGPP framework on December 17, 2021,[27] which was refined through technical conferences and stakeholder engagement to the comprehensive CGPP Proposal of December 27, 2022.[28] Commission action on this proposal remains pending as of this DSIP filing.

The CGPP is currently envisioned as a repeating three-year process with approximately two years for a system study followed by Commission review. The overall process is designed to provide an assessment of New York State's electric

[20] Note 11, *supra*.
[21] State of New York, S.7508--B, A. 9508--B, Senate - Assembly, Part JJJ.
[22] Case 20-E-0197, *Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act* ("AREGCBA Proceeding"), Order on Transmission Planning Pursuant to the AREGCBA (issued May 14, 2020).
[23] AREGCBA Proceeding, Utility Transmission and Distribution Investment Working Group – Group Report (filed November 2, 2020).
[24] AREGCBA Proceeding, Initial Report on the New York Power Grid Study (filed January 19, 2021).
[25] AREGCBA Proceeding, Order on Phase 1 Local Transmission and Distribution Project Proposals (issued February 11, 2021).
[26] AREGCBA Proceeding, Order on Local Transmission and Distribution Planning Process and Phase 2 Project Proposals (issued September 9, 2021).
[27] AREGCBA Proceeding, The Utilities' Coordinated Grid Planning Process and Revised Benefit-Cost Analysis Proposal (filed on December 17, 2021).
[28] AREGCBA Proceeding, Coordinated Grid Planning Process Proposal (filed December 27, 2022).

grid using a 20-year planning horizon. The CGPP will identify key electric grid expansions that can aid in unlocking renewable generation capacity and provide energy headroom to meet the State's clean energy goals while providing value to customers. Moreover, the CGPP will identify opportunities to expand the bulk transmission system to advance CLCPA objectives. The design will also complement and coordinate with the NYISO Comprehensive Planning Process and the utility's T&D planning processes.

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Continued coordination efforts with the Joint Utilities, DPS Staff, NYSERDA, and the NYISO in the LT&D planning process, including identifying and developing Phase 1 projects, providing headroom capacity analysis, and defining the CGPP.
- Continued sharing system data to support DER developer planning, including enhancements to the hosting capacity maps in spring 2023, as well as the IEDR.
- Streamlined and improved the interconnection process to increase speed and transparency.
- Refined and enhanced forecasting methodology.
- Refined NWS process and continued to identify and evaluate opportunities as part of the capital planning process.

Con Edison continues to enhance and expand its distribution system planning processes to:

- Facilitate DER integration, including considering DER as solutions to system needs;
- Account for the various impacts DER can have on the grid and the value they can provide;
- Add features to hosting capacity maps; and
- Streamline the interconnection process and expand it to address technologies beyond DG.

For example, Con Edison continues refining its forecasting processes, including more granular DER forecasts and added load modifiers for electric heating, hot water, stovetops, ovens, and clothes dryers. The Company also performed a study with the Electric Power Research Institute ("EPRI") to understand potential electrification scenarios and the impact on the winter peak forecast,[29] and has developed a DER forecasting application for Electrification of Heating and Non-Heating gas appliances and Battery Energy Storage Systems. The Company is also completing the development of a forecasting application for EV, PV, and DG/CHP. These enhancements are intended to provide a more accurate assessment of DER's contribution to load as well as spatial and temporal uptake, resulting in more representative forecasts. Additionally, Con Edison presents 8,760 hourly load forecasts at the network level, which are available on the Company's hosting capacity maps. Additional information on forecasting is discussed in **Section 2.2**.

As discussed in **Section 2.13**, the Company has institutionalized NWS as a formal element of the annual capital planning process and continues to refine its processes based on ongoing solicitation and implementation experience.

[29] EPRI, *Electrification Scenarios for New York's Energy Future* (February 27, 2020): https://www.epri.com/research/products/3002017940.

Improvements, like the desktop feasibility exercises and energy storage specific RFPs, refine market opportunities to those most likely to yield solutions.

The Joint Utilities released additional updates to the hosting capacity maps in the spring of 2023, following the staging laid out in the Hosting Capacity Roadmap. The latest update features:

- Sub Feeder Level Data for Storage
- Nodal Constraints (Criteria Violations) for PV and Storage
- DG Connected Since Last Map Refresh

Hosting capacity is covered in greater detail in **Section 2.9**. The Company also supports sharing useful system data to support DER planning through the IEDR, described in **Section 2.8**. As the Joint Utilities garner stakeholder feedback, additional functionality will be introduced.

The Company has also provided proposed projects and analysis to support the State's clean energy objectives. As the system planner and operator with accountability for providing service to all customers in its service territory, Con Edison is responsible for safe and reliable operation of a resilient and clean distribution system. To meet these objectives, the Company looks holistically at projects that can solve multiple challenges – that bolster reliability and resiliency while simultaneously expanding capacity to host clean energy. As noted above, the Company proposed Phase 1 and Phase 2 LT&D projects. The Company included the following three projects, known as the Reliable Clean City ("RCC") projects, as part of its 2019 rate case:

- Rainey to Corona PAR-Controlled Feeder Project
- Gowanus to Greenwood PAR-Controlled Feeder Project
- Goethals to Fox Hills PAR-Controlled Feeder Project

The Company is also developing its Phase 2 projects, such as the scalable Brooklyn Clean Energy Hub ("the Hub") – a potential future point of interconnection for up to 6,000 MW of OSW. As of April 20, 2023, the Commission approved the initial construction of the Brooklyn Clean Energy Hub, which will deliver immediate reliability benefits in the boroughs of Brooklyn and Queens and stand as a unique potential make-ready interconnection option that can feed directly into the Company's grid. By developing points of interconnection at load-serving substations, this approach leverages Con Edison's role as the owner and operator of the high-voltage transmission system needed in load-dense New York City while also enabling the retirement of downstate fossil fuel-fired "peaking" generation units and opening pathways ("off-ramps") into constrained transmission load areas.

The Company has collaborated with the Joint Utilities to perform analysis and define processes related to integrated system planning. As part of the Power Grid Study, Con Edison also conducted internal headroom analyses for its LT&D. For local transmission, each utility estimated existing and incremental headroom and how each can impact CLCPA benefits. Con Edison's methods of incremental headroom analysis for distribution differed from other utilities based on its underground meshed distribution networks. The Company determined that DERs are unlikely to cause constraint violations through 2030.[30]

[30] New York Department of Public Service and New York State Energy Research and Development Authority Staff, the Brattle Group, and Pterra Consulting, Initial Report on the New York Power Grid Study, (January 19, 2021), p. 20.

Summary of Future Actions

- Continue collaboration with the JU on future stages of the CGPP cycle.
- Refine forecasting methodologies to improve forecast accuracy.
- Maintain progress on the Hosting Capacity Roadmap.
- Continue to adapt the interconnection process to accommodate new technologies and configurations.
- Continue evaluating potential NWS opportunities as part of the capital planning process.

To meet the CLCPA goals within timeframes established by State policy, Con Edison, in collaboration with the JU, proposes to start the first cycle of the CGPP in mid-2023, subject to a timely Commission Order on the CGPP Proposal. The Joint Utilities also propose to complete the planning process described in the CGPP Proposal within approximately two years. Stage 1 of the CGPP cycle includes data collection and coordination. The purpose of Stage 1 is to (i) consider information from studies performed in past CGPP cycles or performed by other entities, (ii) review key study assumptions and constraints, and (iii) establish up to three generation build-out scenarios with considerations for generation interconnection points.[31] These emission-free generation build-out scenarios will model future assumptions of the New York electric system. Assumptions will also address system features such as zonal load forecasts and the zonal deployment of DER.

Figure 5: CGPP Stage 1 Summary

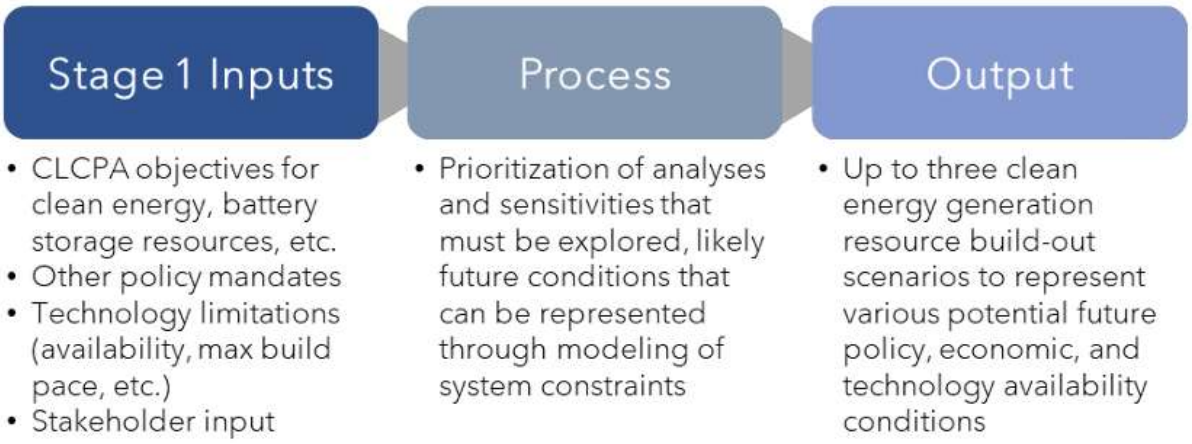
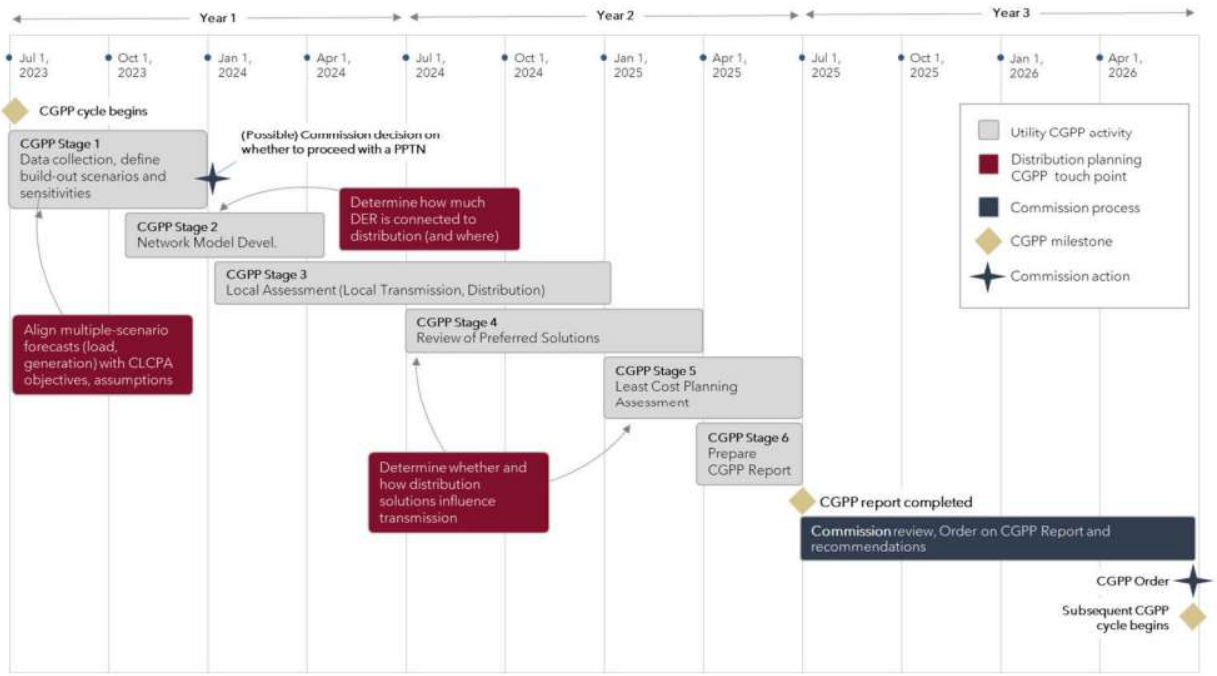


Figure 6: Proposed Timeline and Implementation of the First CGPP Cycle



The continued progress in integrating DER into planning and operations provides a solid foundation for the future. In addition to actions pursued with the JU, the Company will continue to formalize and institutionalize DER into utility planning, including leveraging experience from NWS projects to potentially expand NWS opportunities and modify internal procedures to improve the efficiency and effectiveness of the NWS process.

The Company continues to explore opportunities to incorporate more probabilistic methods into the planning process where they can drive improvement. Probabilistic planning is expected to be most relevant in the forecasting process as related to probabilities around DER proliferation and performance and other variables.

Risks and Mitigation

Building capabilities to support integrated system planning will require investment in enabling technologies, and as such, the timing and extent of some aspects of implementation will be determined by the available funding. Additionally, continued learning as part of demonstration projects and efforts to integrate DER into planning will be fed back into the integrated planning process to inform potential process enhancements.

Stakeholder Interface

As noted above, the Company is evolving the distribution planning process to integrate DER and support DER market growth. The additional value provided to stakeholders is most evident in the externally facing elements of distribution planning, namely the sharing of system data and hosting capacity analysis ("HCA"), the identification of NWS opportunities, and the improving of DER interconnection. The stakeholder interface and benefits are presented in those sections.

[31] Note 19, *supra*, p. 28.

The Company will continue to engage the Joint Utilities, NYSERDA, the NYISO, and DPS Staff in the future development of CGPP cycles. In addition, modifications to the initial CGPP Framework of December 2021 have benefited significantly from the input of stakeholders gained through nine technical conferences, which yielded important insights and constructive changes to the overall process.

Additional Detail

This section responds to the questions specific to integrated system planning.

1) The means and methods used for integrated distribution system planning.

Distribution system planning focuses on forecasting load, identifying system needs, identifying potential solutions to those needs, and selecting and implementing the preferred solution.

Load forecasting is a central component of the distribution system planning process and informs many other planning analyses. Development of the load forecast enables distribution system planners to identify a range of system needs to maintain reliability. Planners use load flow modeling, network reliability modeling, and modeling of system performance to assess the current capability of existing distribution and substation assets to meet the forecasted load, based on the design criteria, type of asset, thermal ratings, and local power factors. These analyses determine which, if any, assets are at risk of becoming overloaded during system peak conditions and under various contingencies. Other system areas of need identified through distribution modeling include:

- Risk reduction programs - to perform necessary inspections and replace components with known performance issues in order to enhance network reliability;
- New business projects - to interconnect new customers or expand service for existing customers; and
- Storm hardening or resiliency projects - to strengthen the electric grid.

In addition to the areas of need listed above, the Company budgets for emergency response and replacement, IT solutions to meet strategic business needs, and public works projects to re-route Company equipment due to municipal right-of-way.

Once a list of system needs is compiled, Con Edison planners identify all potential solutions to address the issues. The capital projects are scored and ranked through an optimization process that seeks to reduce operating risks and efficiently meet strategic objectives. The projects are also assessed against the NWS suitability criteria. Specifically, Company planners review the projects in the 10-year load relief program and determine on a project-by-project basis if the project meets the NWS suitability criteria. The suitability criteria identify projects that: (1) are for load relief, (2) have enough lead time to pursue a NWS without foreclosing the opportunity to install a traditional solution if needed, and (3) offer enough capital deferral or displacement to overcome transaction costs and issues of scale. Suitable projects are assessed for feasibility, then advanced to the solicitation process, where the need is defined in terms of the total MW of load relief required to replace the traditional capacity, the applicable time of day the load relief must be available, and the in-service date(s). This information, along with additional demographic information and project-specific detail, is included in the NWS solicitation. Based on responses, the Company evaluates the viability of implementing a NWS portfolio to meet the MW needs within the required timeframe and conducts a benefit-cost analysis informed by the Benefit-Cost Analysis ("BCA") Handbook. Several iterations may occur until an optimized portfolio is submitted and approved. More detailed information on the distribution planning process can be found in the Company's Initial DSIP.[32]

[32] Case 16-M-0411, *In the Matter of Distributed System Implementation Plans*, Initial DSIP: Con Edison (filed July 8, 2016): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={21B451D7-C964-404E-BF15-7F43C5E4D2EB}, pp. 20-152.

In addition to traditional means and methods used in distribution system planning, the Company plans to begin Stage 1 of the CGPP cycle in late 2023, which will serve as the basis for a least-cost statewide integrated resource planning process. Part of Stage 1 includes coordination and determination for capacity expansion build-out scenarios using data inputs, such as CLCPA objectives, load forecasts and shapes, publicly available NYSERDA procurement data, forecasted amounts and locations of DER, and any supplementary information used to inform model results. In turn, generation build-out is projected by the capacity expansion model for each planned scenario that will serve as the basis for the ideal generation build-out plan. The Company will use the capacity expansion simulations to identify the appropriate amount and type of utility-scale renewable generation, storage, and emissions-free generation that is required to meet CLCPA targets.

2) How the utility's means and methods enable probabilistic planning which effectively anticipates the inter-related effects of distributed generation, energy storage, electric vehicles, beneficial electrification, and energy efficiency.

Probabilistic planning is a tool to address uncertainty and risk. With DER penetration still relatively low, probabilistic planning is in its early stages. Current probabilistic planning methods within distribution planning are focused on evaluating the need for feeder relief to meet reliability standards, as measured by the Network Reliability Index ("NRI"). The NRI model is the primary tool used to predict the reliability of the networks. It determines the relative strength of each network by calculating the probability of failure of multiple associated feeders within a network over time, as caused by individual component failures.

Starting in May 2017, the Company modified its process of evaluating overloads on 13, 27, and 33 kV feeders to incorporate probabilistic planning, as well as DER. The probabilistic approach allows the Company to lengthen the load relief timeline, which increases the likelihood that DER could be deployed to meet the load relief need. When evaluating overloads, if the NRI is less than 0.2, the Company will defer resolving overloads of up to 10 percent of the network load by three years. In the past, the Company would relieve the overload for the following summer.

Because of the intermittent nature of the DER, specifically DG, the Company uses scenario analysis to consider additional factors to assess reliability under peak load conditions for normal and contingency conditions. The planning process requires two design requirements to be satisfied:

(1) Traditional Baked-in model,[33] which uses the net load of a peak day, factoring in DER output.

(2) New DER Baked-out model (or worst-case DER scenario),[34] which assumes DER is unavailable on a peak day.

If both of these requirements are met, meaning the poly-voltage load flow ("PVL") model runs show no overload under these scenarios, there is no further analysis required. Where one or both of these requirements are unmet, further analysis is required to determine if DER operations can adequately meet the peak load requirements. In the future, production data collected through ConnectDER and DERMS work will provide additional information on DG production relative to forecast.

3) How the utility ensures that the information needed for integrated system planning is timely acquired and properly evaluated.

The Company has established processes for collecting and evaluating data required for system planning. The load forecast is developed internally using a range of inputs, including customer data, economic indices, and new business

[33] The term "baked-in" as used as this model evaluates the "net" load, and is confirming whether the system, with load and DER output at the time of the previous design peak, is adequate for the level of contingency needed.
[34] The model takes the nameplate or maximum value of the DER and adds it as load to the baked-in model.

jobs in the queue. DER forecasts are an increasingly important input to the system, and network forecasts are informed by data from the interconnection queue, as well as known program activity, such as approved EE programs. Additionally, the Company has visibility into new business jobs, typically extending over five years. Significant jobs within the electric service territory are evaluated to determine the total load (and appropriate phasing-in), the network location, and when it will come online. More detail on load and DER forecasting is included in **Appendix A**. Further, the Company's investments in AMI and grid modernization technologies, such as GIS and DERMS, will increase the information available to system planners, particularly at the grid edge, as will data from the CGPP process. Part of Stage 1 includes coordination and determination for capacity expansion build-out scenarios using data inputs, such as CLCPA objectives, load forecasts and shapes, publicly available NYSERDA procurement data, forecasted amounts and locations of DER, and any supplementary information used to inform model results.

4) **The types of sensitivity analyses performed and how those analyses are applied as part of the integrated planning process.**

The Asset Management Life-Cycle Models includes sensitivity analyses as part of the modeling. These models, used in the electric long-range plan for asset management, simulate the behavior of the asset fleet under various conditions, enabling what-if analysis across multiple scenarios. The models incorporate three distinct components: (1) the characteristics of the asset fleet, (2) the effectiveness of proactive replacement and maintenance, and (3) the asset-management actions needed to achieve the desired service level.

The project began in 2016 with the separation of major assets into 12 asset groups and selection of three assets to model in 2016: wood poles, underground distribution cable, and 4 kV unit substation transformers, and two in 2017: network transformers and network protectors. An Asset Management Life-Cycle model is created for each asset group to provide decision-making and scenario planning, including sensitivity analyses. The model uses sensitivity analyses to evaluate a replacement strategy, such as replacing a certain percent of the poorest performing assets each year for the next 10 years. The model predicts asset failure rate trends and how the failure rate is influenced by variations in key parameters, such as inherent asset deterioration with age and use, unit cost, and the likely condition of the assets renewed. Scenario planning will address future asset performance based on an asset maintenance strategy and renewal factoring in historical data and performance.

The capacity expansion modeling simulations created during Stage 1 of the CGPP will include existing limits on the bulk system's capability to transfer power between the New York Control Area ("NYCA") zones. To the extent that the bulk system transfer limits appear to be restricting the economic build-out of renewable generation, the Company may need to perform sensitivity analyses to evaluate the effect of relaxing the bulk transfer limit. The results of the sensitivity analyses – holding modeling input assumptions used to develop the generation build-out scenarios in the initial stage of the CGPP planning cycle constant – could potentially inform the need to consider expansion on the bulk system.

5) **How the utility will timely adjust its integrated system plan if future trends differ significantly with predictions, both in the short-term and in the long-term beyond the DSIP timeline.**

The Company updates its 20-year load forecasts on an annual basis as part of the capital planning process. In developing the forecast, the Company incorporates the best information available at the time, extending over the 20-year period. To the extent that future trends differ from past assumptions, such as increased load from electrification efforts or ramp-up of EE efforts, the Company incorporates the new information into the forecast, which flows into the system planning process. As such, the system plan evolves in line with trends as well as unforeseen developments. The integrated system plan will also be informed and adjusted as inputs from the CGPP require.

Additionally, the Company's integrated system plan has evolved from what was once a capacity-centric expansion program to one that favors distribution level flexibility and optionality. While the rates of load growth and DER

penetration may change over time, Con Edison aims to advance the grid's ability to move from a static system to a more modern system capable of adapting to changes in trends with operational flexibility.

6) The factors unrelated to DERs – such as aging infrastructure, electric vehicles, and beneficial electrification – which significantly affect the utility's integrated plan and describe how the utility's planning process addresses each of those factors.

As noted above, Company planners use load flow modeling, network reliability modeling, and modeling of system performance to assess the current capability of existing distribution and substation assets to meet the forecasted load, based on the design criteria, type of asset, thermal ratings, and local power factors. This process identifies a range of system needs, including risk reduction programs to address asset health, of which equipment age is one factor, along with maintenance history, performance, and other factors. Several assets have replacement/renewal strategies based upon calculated Asset Health Indexes. For example, the unit substation transformer health index calculation uses Dissolved Gas in Oil Analysis, Furan test results, transformer loading, apparent corrosion, oil leaks, load tap changer functionality, environmental impact, proximity to the public, and age as factors.

Recent policy changes represent a significant departure from past EV and electrification trends. As noted in **Section 2.5**, the Commission issued an order in July 2020 authorizing an EV MRP.[35] The EV MRP aims to accelerate the development of EV charging infrastructure by reducing the upfront costs associated with building EV charging stations. The MRP is intended to support the State's goal of deploying 850,000 ZEVs by 2025. Con Edison is committed to continually refining processes that accommodate the increased request volume based on the Make Ready Order. The Company further expects the distribution system to plan for and accommodate the projected increase in home EV charging. With the April 2023 launch of a new proceeding[36] to address barriers to MHDV electrification, the Company expects to see significant growth in electrification of trucks and buses. This new proceeding will also address the need for proactive grid planning for electric vehicle load, moving away from a just-in-time approach given the fast ramp up of large concentrated electric vehicle loads expected, so the grid can be ready to support the clean transportation transition.

Similarly, the discussion around heating electrification is continuing to evolve. For example, the Commission established a statewide minimum heat pump target of 3.6 trillion British thermal units TBtu by 2025 at a total cost of approximately $454 million, with utilities serving as the primary administrators of heat pump programs. Con Edison's eclipsed its 2020-2025 heat pump target of 1 TBtu by 15 percent in February 2022, leading to the pursuit of additional funding support for the program. The added load from heat pumps is captured in a load modifier for heating electrification and applied in the winter peak forecast, and the distribution system will plan for and accommodate the projected increase in load from this electrification.

The Company has also begun work on methodologies to incorporate CLCPA goals, policy objectives, and lessons learned from the Vulnerability Study[37] as inputs to demand and sales forecasts. The Vulnerability Study is based on a probabilistic, risk-based approach that considers the likelihood and consequence of potential changes in the climate, including assessing the probability of plausible future climate outcomes and the associated impact on Con Edison's service territory. For example, to assess an asset class risk to changes in heat and humidity, the study team used a risk workbook to develop an overall risk score for each relevant asset and climate change hazard combination. The information is being used to prioritize operations, planning processes, and asset types for further analysis and potential remediation. In addition, the Company may use outputs of the Vulnerability Study to identify areas that may be more likely to experience load growth, or DER penetration, based on projected climactic risks and impacts. The Company will

[35] EV Proceeding, Order Establishing Electric Vehicle Infrastructure Make-Ready Program and Other Programs ("Make-Ready Order") (issued July 16, 2020).
[36] Note 11, *supra*.
[37] Note 10, *supra*.

continue to explore opportunities to incorporate more probabilistic methods into the planning process where they can drive improvement.

7) **How the means and methods for integrated electric system planning evaluate the effects of potential energy efficiency measures.**

The Company has a long-standing practice of incorporating EE and demand response ("DR") as load modifiers that reduce the total forecasted load (or gross load). The Company added organic or naturally occurring EE and Conservation Voltage Optimization ("CVO") as load modifiers in the fall 2017 forecast to further refine the forecasting process. See **Appendix A** for a detailed discussion of how EE and DR forecasts are developed and applied in the Company's forecasts.

8) **How the utility will inform the development of its integrated planning through best practices and lessons learned from other jurisdictions.**

In addition to collaboration with the JU, the Company coordinates through EPRI, the Institute of Electrical and Electronics Engineers ("IEEE"), and other industry forums to exchange information and stay informed on best practices and lessons learned from other jurisdictions. Company planners have developed relationships through those forums with other utility peers, who are a resource for questions and discussion. Additionally, Con Edison is developing its own best practices based on the unique characteristics of its system, including modifying its planning procedures to increase opportunities for NWS.

2.2. ADVANCED FORECASTING

Context and Background

The development of long-term load forecasts is a central function of distribution system planning and a key input to the Company's strategic and long-range planning. Electric system and network independent peak demand forecasts guide infrastructure investment decisions, directing capital to the areas of greatest need and setting the stage for identification of NWS and location-specific pricing. Additionally, peak demand forecasts serve as an input to the bulk level system planning process, while energy forecasts determine the revenue forecast and set rates. Both peak and energy forecasts are utilized in electricity supply plans in the long-term and short-term.

The considerable shifts underway in the energy industry, driven in large part by the CLCPA and other policy actions, increase the importance of developing forecasts that accurately represent future load and support sound decision-making on future investments, including projecting the right type of investments and solutions at the right times and locations. The possible outcomes of these shifts add to the complexity of predicting how consumption will change over time. The Company has continued to refine its forecasting processes year over year, including more granular DER forecasts, and the addition of electrification load modifiers for electric heating, hot water, cooking gas, clothes dryers, and vehicles. Various supporting studies and forecasting models and tools have been recently deployed or are under development to help adapt and predict customer demand and energy requirements. The Company is also working with industry experts to develop a tool with several DER forecasting modules. Some modules are fully functional and being utilized (EoH/EoNH and BESS) and the balance of modules are expected to be commissioned by early fall 2023. Additionally, Con Edison continues to coordinate with NYISO to align forecasting inputs and methods and share best practices among the Joint Utilities.

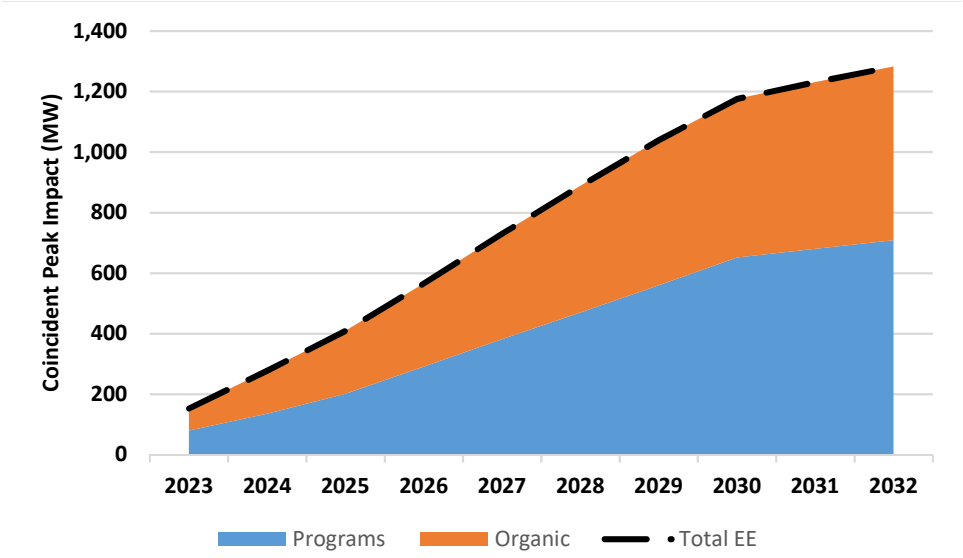
Con Edison's 2022 forecast projects an increase in overall electric system load growth, with a compound annual growth rate ("CAGR") of 0.6 percent annually over the 5-year period and 0.7 percent annually over the 10-year period, resulting in a 2032 system coincident peak of 13,570 MW. The increase in the later years is due to projected demand growth and an increase in EVs and electrification of non-heating ("EoNH"), while savings growth from DSM levels off. The system peak forecast includes 1,127 MW of incremental coincident demand reduction by 2027, growing to 1,959 MW by 2032. Table 1 summarizes the impacts that offset peak load in the five-year system peak forecast.

Table 1: Summary of Forecasted Demand Reduction (MW) from Load Modifiers – 2022 Summer Peak Forecast

Negative Load Modifier	2023	2024	2025	2026	2027
Photovoltaics/Solar (PVs)	-40	-70	-105	-135	-156
DG	-11	-24	-44	-49	-53
Energy Storage	-9	-53	-104	-131	-187
Organic EE/ Codes and Standards	-73	-143	-208	-274	-349
Coincident DSM	-80	-135	-201	-291	-382
Total Rolling Incremental MW Reduction	**-214**	**-426**	**-661**	**-880**	**-1,127**

The Company incorporates the most current information available when producing the forecast, and updates trends and assumptions accordingly. For example, as shown in Figure 7 below, the Company's DSM peak demand forecasts have been updated to reflect the increased policy focus on EE savings and continuing market trends.

Figure 7: 10-Year Forecast for EE During System Peak (Rolling Incremental)



As DER penetration grows, the forecasting of DER at more granular levels becomes increasingly important. More robust and granular DER forecasts should improve forecast accuracy. At the same time, increased adoption of DER introduces new challenges for maintaining forecasting accuracy due to uncertainties associated with the variability of DER output, DER's evolving correlation with net load, and the impact of geographic diversity on aggregate DER output. Con Edison is committed to continued coordination with the NYISO and its Load Forecasting Task Force, which is comprised of the JU, to enhance forecasting approaches, inputs, and assumptions.

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Refined and enhanced forecasting methodology, including addition of new load modifier for heating electrification to the winter peak forecast, as well as EoNH in both summer and winter, and battery energy storage systems ("BESS").
- Developed a new DER forecasting integrated tool that will produce 20-year electric forecasts for battery storage and heating electrification.
- Worked on leveraging AMI data to enhance reporting, analytics and forecasting for customer behavior and load-modifying technology.
- Collaborated with the NYISO, various consultants, and other internal company subject matter experts ("SME") on an in-depth evaluation of the economic and technical potential for electrification statewide and implications for the bulk power system.
- Through the NYISO's Load Forecasting Task Force, collaborated with the Joint Utilities to share best practices and align forecasting approaches.
- Utilized an Efficiency and Demand Management ("EEDM") forecast tool developed by outside experts.
- Coordinated with NYISO to share data inputs and assumptions and promote alignment between distribution level and bulk system forecasts.
- Performed annual benchmarking with National Grid to determine electrification of heating ("EoH") and non-heating appliances in their gas service territory, which is located within Consolidated Edison Company of New York, Inc.'s ("CECONY") electric service territory. Integrated the winter electric peak demand forecast and the natural gas peak demand forecast with consideration of electrification of CECONY gas heating, National Grid gas heating and non-heating gas appliances, and oil heating in CECONY's electric service territory.
- Published an 8,760 forecast at the network level.

The Company continues to refine its forecasting process to be more granular and incorporate a broader range of drivers affecting electric demand. The Company has a long-standing practice of incorporating EE and DR as load modifiers that reduce the total forecasted load (or gross load). The Company has evolved its forecasting methodologies and expanded them to specifically include PV, combined heat and power ("CHP"), EVs, energy storage, EE, CGO, and electrification of heating as load modifiers. Together, these modifiers provide a more holistic view of consumption trends and impacts.

In 2020, the Company developed a new DER forecasting tool that will better incorporate new technologies and end uses, such as storage and building electrification, and is working currently on extending this tool to EVs, solar PV, and DG/CHP. The EoH module was first used in winter 2020/2021. The battery storage module was first used in summer 2022 to produce the 2023 forecast.

As the AMI implementation plan is almost complete, the Company is developing use cases to use actual AMI consumption and demand data to perform granular analysis of customer trends. The Company will leverage these insights to improve forecast methodologies for new technology uptake and better model customer behavior with service territory specific load curves.

The Company was also part of the EPRI team that assessed the implications of the CLCPA goals on New York's future energy system.[38] This study used a sophisticated and integrated model New York Regional Economy, Greenhouse Gas, and Energy Model ("NY-REGEN") to evaluate scenarios for EVs, building energy systems, fuel-switching in energy end uses, rooftop solar and DER, energy storage, electric system operation, prices for energy and capacity, imports and exports, capacity additions, fuel use and diversity, and CO_2 emissions. The findings of this report, taken with internal Con Edison studies, inform the Company's understanding of how the peak will shift in response to CLCPA goals, including a higher winter peak, as well as opportunities to manage that growth. The Company also has been supporting the Local Law 97 ("LL97") Steering Council and has a direct line of sight toward correlating this law to EE and EoH forecast algorithms.

Con Edison also implemented enhancements to its primary near-term forecasting tool, MetrixIDR, which provides 82 electric network hourly forecasts and 13 radial feeder hourly forecasts as well as forecasts for the relevant Area Stations. These included a mechanism to forecast DERs' contribution to the weather-adjusted peak ("WAP") on a system wide basis and by electric networks, and to forecast for future DER. Additionally, the Company developed five-minute interval forecasting models for dispatching DERs.

The Joint Utilities continued to coordinate with the NYISO and its Load Forecasting Task Force members on the forecasting of load and DER, as well as track developments in other states to identify lessons learned and best practices.

Future Implementation and Planning

Summary of Future Actions

- Refine existing load modifiers and add new modifiers, as appropriate.
- Share information and coordinate with the Joint Utilities and the NYISO on load and DER forecasting.
- Develop a Gas Distribution System Forecast Tool to inform and plan locationally and to help determine local gas distribution districts that would benefit from non-pipes solutions (electric heat pumps).
- Implement AMI Business Analytics Forecasting Tool and PV, DG/CHP, and EV Forecasting Tool Modules.

The Company will continue to refine its forecasting methods in support of greater accuracy, recognizing that some degree of statistical error is inherent in the process. Aspects of these refinements, as well as new capabilities, will be enabled by the planned upgrade to MetrixIDR.

Con Edison will continue to coordinate with the NYISO and its Load Forecasting Task Force members on the forecasting of load and DER and will monitor developments in other states to identify lessons learned and best practices. Future discussions will continue regarding utility and NYISO load and DER forecasts.

The Joint Utilities will continue discussing forecasting items and hold technical workshops as needed on topics such as:

- Locational value/marginal cost of service ("MCOS") studies.
- Advanced load/DER forecasting.
- Applying probabilistic forecasting to transmission, substation, and distribution planning models.
- Developments from other jurisdictions to identify relevant lessons for JU forecasting efforts.

[38] Note 29, *supra*.

Additionally, the Company will implement its AMI Business Analytics Forecasting Tool and PV, DG/CHP, and EV Forecasting Tool Modules. Con Edison will work through use case iteration for the AMI Business Analytics Forecasting Tool which is discussed in greater detail in **Section 2.12**.

Risks and Mitigation

As forecasting becomes more complex and the demand for additional and more granular forecasts increases, such as forecasts at the circuit level, the Company may require additional resources, including staff. The availability of resources may affect implementation timelines.

Stakeholder Interface

With the publication of the 8,760 forecasts, the JU shifted its stakeholder focus to coordination with the NYISO, as described above. Con Edison remains open to further stakeholder engagement should the need or interest arise.

Additional Detail

This section responds to the questions specific to advanced forecasting.

1) **Identify where and how DER developers and other stakeholders can readily access, navigate, view, sort, filter, and download up-to-date load and supply forecasts.**

The Company provides extensive system data, including load and energy forecasts, through the Company's Hosting Capacity Platform available through the online data portal.[39] The data portal and hosting capacity map are accessible through the Digital Customer Experience ("DCX") web interface, linked from the Joint Utilities' website,[40] and easily found via internet searches. Within the hosting capacity maps, developers and other stakeholders can view and download network-level 8,760 hourly load forecasts and network-level 24-hour peak load and minimum load duration curves.

Every year, following the summer peak season, the Company produces a series of forecasts to guide the next planning cycle, including a 20-year electric system peak demand forecast and a 5-year system energy forecast, as well as a 20-year network independent peak demand forecast. **Appendix A** includes the most current forecasts.

2) **Identify and characterize each load and supply forecasting requirement identified from stakeholder inputs.**

The Joint Utilities host stakeholder engagement sessions twice a year. The Joint Utilities solicit stakeholder feedback and participate in discussions on several forecasting topics of interest to stakeholders, including forecasting use cases and the role of 8,760 forecasts in addressing those use cases; incorporation of additional external inputs to utility forecasts such as public policy and developer forecasts; and the evolution of forecasting to incorporate more probabilistic methods and scenario analysis.

In response to stakeholder interest and Commission guidance, in 2018, Con Edison developed and published its first 8,760 hourly load forecasts at the network level, consistent with methodologies discussed with the JU. The development of 8,760 forecasts included internal discussions among the JU on topics like data resources, treatment of interconnection queue data, and policy issues. For this DSIP cycle, the Company adapted its refresh of the 8,760 forecasts, which are available as part of the network data provided on the Company's hosting capacity maps. These

[39] Con Edison hosting capacity website: https://www.coned.com/en/business-partners/hosting-capacity.
[40] Joint Utilities hosting capacity website: https://jointutilitiesofny.org/utility-specific-pages/hosting-capacity.

refreshed forecasts are influenced by the consumption pattern changes due to the Coronavirus 19 ("COVID-19") pandemic, especially in New York City and the surrounding areas. For example, Manhattan's electric load patterns were materially impacted in 2020, 2021, and a portion of 2022. As such, Con Edison used its 8,760 forecast load shapes and adjusted them to the 2022 summer network and radial feeder independent peak demands. The Company will continue to monitor network load shapes to identify post-pandemic steady-state patterns and will refresh these forecasts as necessary. As all forecasts contain some level of error; and due to the uncertainty of consumer behavior, energy markets, future weather, and the rebound from COVID-19, the Company will not be held liable for any error or omissions associated with such forecasts provided.

3) Describe in detail the existing and/or planned forecasts produced for third-party use and explain how those forecasts fulfill each identified stakeholder requirement for load and supply forecasts.

See response to "2)" above.

4) Describe the spatial and temporal granularity of the system-level and local-level load and supply forecasts produced.

At the system level, the Company produces a 20-year electric peak demand forecast and a 5-year energy forecast. At the network level, the Company produces a 20-year independent peak demand forecast and 8,760 hourly load forecasts extending three years (see response about 8,760 hourly load forecasts in "2)".

5) Describe the forecasts provided separately for key areas including but not limited to photovoltaics, energy storage, electric vehicles, and energy efficiency.

The Company has a long-standing practice of incorporating EE and DR as load modifiers that reduce the total forecasted system load (or gross load). The Company has evolved its forecasting methodologies and expanded them to specifically include PV, CHP, EVs, EoH, EoNH, and energy storage. As discussed above, the Company added organic or naturally occurring EE and CVO as load modifiers in the fall 2017 forecast and an electrification of heating load modifier to the fall 2019 winter peak forecast to further refine the forecasting process. The Company will look for opportunities to refine existing load modifiers and potentially add new modifiers as DER technologies proliferate.

Appendix A includes a detailed description of the DER forecasts, including methodology and the latest forecasts.

6) Describe the advanced forecasting capabilities which are/will be implemented to enable effective probabilistic planning methods.

The Company has discussed opportunities to advance forecasting capabilities to better reflect the impacts of DER on system needs, including developing draft forecast methodologies related to:

- Dispatching DER (five-minute intervals)
- Committing DER (hourly to day ahead or two days ahead)
- Scheduling work on the network (weekly)
- Scheduling DER maintenance (monthly)

For example, to build a forecast for dispatching DER, the Company would use the probabilistic output from multiple weather service models to blend weather temperatures and other variables with their corresponding probability of occurrence. To do this, the Company would need a short-term, local, and refined weather forecast that uses data from high-quality local weather radars, such as a high-frequency S-band dual pol radar, short-term solar radiance and wind forecast models based on satellite imagery from GOES-16, and National Aeronautics Space Administration ("NASA")

solar flare models. The Company would incorporate feedback from DER set-points to produce and forecast the next five-minute setpoints.

The Company also plans to use actual customer hourly load data from AMI to help determine customer contribution to peaks. As described above and below, Con Edison is adding and refining load modifiers to better capture exogenous factors influencing peak load.

7) Describe how the utility's existing/planned advanced forecasting capabilities anticipate the inter-related effects of distributed generation, energy storage, electric vehicles, beneficial electrification, and energy efficiency. In particular, describe how electric vehicle and energy efficiency forecasts are reflected in utility forecasts.

See response to "5)" above.

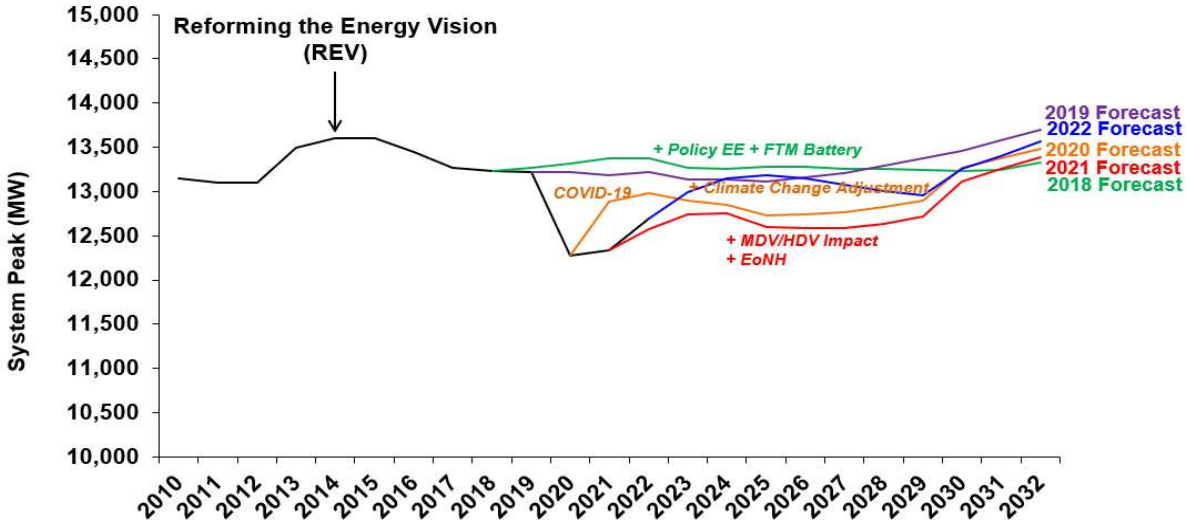
8) Describe in detail the forecasts produced for utility use and explain how those forecasts fulfill the evolving utility requirements for load and supply forecasts.

System and network peak demand forecasts guide infrastructure investment decisions, directing capital to the areas of greatest need and setting the stage for identification of NWS and location-specific pricing. Additionally, bulk level system planners use peak demand forecasts as an input to their planning process. Separately, Con Edison uses energy forecasts to determine the revenue forecast and set rates.

The forecasting of DER becomes increasingly important as DER penetration grows, requiring more granular load forecasts and a better understanding of DER performance. As peak demand forecasts incorporate these improvements, Con Edison expects forecast accuracy to improve and the impact of DER growth on system planning to be clearer and more actionable. At the same time, increased adoption of DER introduces new challenges for maintaining forecasting accuracy due to uncertainties associated with the variability of DER output, its evolving correlation with net load, and the impact of geographic diversity on aggregate DER output.

To that end, the Company continues to refine its forecasting process, including the addition of new load modifiers to provide a more complete assessment of the factors affecting the forecasts, thus supporting greater accuracy. Figure 8 shows how the addition of DER load modifiers has significantly reduced the 20-year forecasts in line with the increased adoption of these technologies.

Figure 8: Historical 10-Year System Peak Forecasts



	2018	2019	2020	2021	2022
5 - Year CAGR	0.1%	-0.1%	0.7%	0.4%	0.6%
10 - Year CAGR	0.0%	0.1%	0.8%	0.7%	0.7%

The slight increase in the later years is due to projected demand growth and an increase in EVs and EoNH, while savings growth from DSM levels off and CVO reaches saturation with the full deployment of AMI.

The Company treats resources capable of exporting energy to the grid, such as PV, as load modifiers in the forecasts. Separating onsite consumption from exported energy (i.e., supply) would require a level of disaggregation and granularity not currently practical or meaningful to forecast outputs.

9) Describe the utility's specific objectives, means, and methods for acquiring and managing the data needed for its advanced forecasting methodologies.

Con Edison uses a range of data inputs to produce its forecasts, including but not limited to meter data, queued projects, technology-specific growth forecasts, and macro-economic trends. To support more advanced forecasting methodologies, the Company is working on leveraging more granular and accurate meter data available through AMI. Actual customer hourly load data from AMI coincident with system, network or substation peaks will help in the determination of customer contribution to these peaks by customer type. The Company can then extrapolate this information to the queue of customers connecting to the system to determine short- and long-term (one-year) growth. With AMI data, the Company can also calculate a customer's load with DR and DER reductions to determine, by customer type, the reductions at the time of the peak.

The Company is also interested in evaluating the benefit of acquiring more meteorological data, such as high-frequency S-band dual pol radar data, to enable more granular DER forecasting and dispatch.

10) Describe the means and methods used to produce substation-level load and supply forecasts.

Please refer to **Appendix A** for detailed information regarding the weather adjustment process and associated forecasting process.

The Company's 8,760 hourly forecasts in this DSIP are based on the consumption patterns from 2019. The hourly loads for the forecasted years have been adjusted to match the 2022 load forecasts. It is important to note that the early forecasted years have been influenced by the COVID-19 pandemic recovery. Con Edison believes that the modified load shapes from 2019 are a more accurate representation of the hourly forecasts for the near-term years, compared to the current load distribution. The Company will actively monitor network load shapes to identify post-pandemic steady-state patterns and will update the 8,760 forecasts if a more accurate prediction becomes available. The most up-to-date 8,760 hourly forecasts can be accessed on the Company's Hosting Capacity Platform and is available until 2026.

11) Describe the levels of accuracy achieved in the substation-level forecasts produced to date for load and supply.

The system peak forecast has an average 5-year error rate of approximately 2.4 percent and the network independent peak forecast for individual networks and radial systems has an average 5-year error rate of 8.6 percent. These variances from forecast are high and reflect the error caused by the COVID-19 Pandemic. These values were 1.0 percent and 2.8 percent respectively in the last DSIP filing. The Company expects these to variances to reduce in 2023 and beyond.

12) Describe the substation-level load forecasts provided to support analyses by DER developers and operators and explain why the forecasts are sufficient for supporting those analyses.

The Company's Hosting Capacity Platform includes 8,760 hourly forecasts at the network level. Stakeholders requested the 8,760 forecasts to provide an indication of the duration of peak and off-peak periods, which might be useful for evaluating energy storage opportunities.

13) Provide sensitivity analyses which explain how the accuracy of substation-level forecasts is affected by distributed generation, energy storage, electric vehicles, beneficial electrification, and energy efficiency measures.

The Company will continue to assess the impact of DER on network and system-level forecast accuracy and refine methodologies as appropriate. The Company updates its assumptions each year. For example, the Company collects detailed outage information from CHP customers seeking a reliability credit and uses the information to develop metrics that analyze outage frequency, duration, causes, and many other factors related to outages. The Company will also issue an annual public report showing aggregate metrics for each network.

As noted above, the system peak forecast has an average 5-year error rate of approximately 2.4 percent and the network independent peak forecast for individual networks and radial systems has an average 5-year error rate of 8.6 percent. These are high values and reflect the error caused by COVID-19. These values were 1.0 percent and 2.8 percent respectively in the last DSIP filing. The Company expects these two variances to reduce in 2023 and beyond. In 2022, the Company introduced contingency and high forecast sensitivities above its base electric network and radial supply independent peak demand forecasts. These sensitivities are to help inform the planning process.

14) Identify and characterize the tools and methods the utility is using/will use to acquire and apply useful forecast input data from DER developers and other third-parties.

The Company relies on actual impacts from installed DER technologies and programs, as well as data from government and industry sources to build the forecast. The Company believes the current practice of using actual performance data

and data from trusted academic sources results in a more accurate forecast and prevents potential market manipulation. Additionally, some DER developers may consider information about forecasted installations and market activities to be sensitive competitive information.

15) **Describe how the utility will inform its forecasting processes through best practices and lessons learned from other jurisdictions.**

Con Edison occasionally benchmarks with other utilities, including through NYISO's Load Forecasting Task Force. In this forum, the Company collaborates with the Joint Utilities to share internally developed best practices, discuss best practices from industry leaders, and align possible forecasting approaches with the NYISO.

16) **Describe new methodologies to improve overall accuracy of forecasts for demand and energy reductions that derive from EE programs and increased penetration of DER. In particular, discuss how the increased potential for inaccurate load and energy forecasts associated with out-of-model EE and DER adjustments will be minimized or eliminated.**

As discussed above, the Company has taken a number of steps, including investment in forecast related capital projects, to improve forecast accuracy by better capturing the impacts of DER on load, particularly through the addition and refinement of load modifiers. The Company will continue to refine its forecasting methods in support of greater forecasting accuracy, recognizing that it cannot completely eliminate statistical error and weather uncertainty inherent in the process.

17) **Describe where CGPP forecast information can be found.**

Pending the Commission's guidance and approval of the CGPP Proposal, the Company will work with the Joint Utilities, DPS Staff, NYSERDA, and members of the Energy Policy Planning Advisory Council ("EPPAC") to develop generation build-out scenarios, including assumptions for yearly load forecasts and shapes.

2.3. GRID OPERATIONS

Context and Background

Con Edison continues to make investments, build capabilities and execute strategies to enable clean energy and continue to deliver safe and reliable electric service. The ambitious policy targets of the clean energy transition will require new operational capabilities to be rapidly developed at scale. Through State policies, like the CLCPA Scoping Plan,[41] New York is targeting a supply mix that is 70 percent renewable by 2030 and fully renewable by 2040; 6 GW of distributed solar by 2025; 3 GW of energy storage by 2030; 9 GW of OSW by 2035; with 1-2 million electrified homes by 2030; and the electrification of transportation. In December of 2019, the Company conducted its Vulnerability Study[42] to aid in the ongoing review of the Company's system design standards and development of its Climate Change Implementation Plan[43] ("Implementation Plan"). Together, the Vulnerability Study and Implementation Plan demonstrate and reinforce Con Edison's long-standing commitment to maintaining the reliability and resiliency of its core utility infrastructure in the face of climate change.

The energy industry transition will change the way that electricity is produced, consumed, and managed minute-to-minute. To continue providing safe and reliable electric service, Con Edison will require a grid that is more flexible and adaptable to grid events, stresses, and emerging requirements. EPRI defines flexibility as "the ability to adapt to dynamic and changing conditions, for example, balancing supply and demand by the hour or minute, or deploying new generation and transmission resources over a period of years."[44] The Company will also need to interface with the NYISO to account for resources participating in its market services. Finally, the Company is investing to continue to deliver electricity to its customers safely, reliably, and efficiently.

Con Edison is making investments in technologies to enable deeper penetration of DER, automate manual processes, enhance planning and operational tools, expand hosting capacity limits, and continue to manage the grid reliably. These investments include systems, sensors and control devices, telecommunications, and grid infrastructure to deliver these capabilities. Con Edison's progress in building these capabilities is discussed below in the following areas:

1. Enabling DER integration and electrification
2. Developing and applying ISO-DSP coordination mechanisms for DER market services
3. Enhancing core service through safety, security, and reliability

In parallel with State policy that will drive the proliferation of clean energy technologies, federal policy will open opportunities for these resources to participate in organized markets. In the last several years, the FERC has passed orders to integrate DER into the wholesale markets it regulates. With Order 841,[45] issued in 2018, the FERC required each Regional Transmission Organization ("RTO") and Independent System Operator ("ISO") to revise their tariffs to facilitate the participation of electric storage by allowing these resources to participate in established capacity, energy, and ancillary services markets. The order specified that the storage could be of any technology, interconnected at the

[41] Note 1, *supra*.
[42] Note 10, *supra*.
[43] Con Edison's Climate Change Implementation Plan (Case Numbers: 19-E-0065 and 19-G-0066) (December 29, 2020): https://www.coned.com/en/our-energy-future/our-energy-vision/storm-hardening-enhancement-plan.
[44] EPRI, *Electric Power System Flexibility: Challenges and Opportunities*: https://www.epri.com/#/pages/product/3002007374/.
[45] FERC, *Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators* (RM16-23-000; AD16-20-000; Order No. 841) (issued February 15, 2018).

transmission level, the distribution level, or behind-the-meter ("BTM"), with a minimum size of 100 kW. Additionally, it required that the resource can be dispatched at the wholesale market clearing price as both a wholesale seller and buyer. Order 2222,[46] passed in 2020, effectively removed barriers to participation in RTO/ISO markets. Aggregated DER can satisfy size and performance requirements they may not meet on a standalone basis and benefit from sharing market participation costs (e.g., metering, telemetry, and communication equipment).

The NYISO is the FERC-jurisdictional system operator for New York utilities, responsible for adjusting market participation rules and operational processes to comply with these FERC Orders. The NYISO has been at the forefront of integrating DER. Since 2017, the JU have collaborated with the NYISO to develop operational coordination requirements and processes to provide greater opportunities to realize DER value. The NYISO's DER participation model,[47] launched in April 2023, defines the rules through which DER or aggregated DER may provide and be compensated for market services.

Federal policy is also spurring investments in infrastructure to facilitate the clean energy transition. The Infrastructure Investment and Jobs Act ("IIJA") was passed by Congress and signed into law on November 15, 2021. The legislation is a $1.2 trillion investment in the nation's infrastructure, including roads, bridges, railways, airports, broadband, and the electric grid. The IIJA bill funds programs for grid resilience and smart grid capabilities, transportation electrification, cybersecurity, transmission, energy storage, and EE, among other topics, through a combination of grants, bonds, incentives, and loans. The Inflation Reduction Act ("IRA"), passed in August 2022, expands federal energy and climate funding, with $369 billion of funding to lower the cost to manufacture and deploy carbon-free technologies, reduce GHG emissions, and drive domestic industrial policy.

[46] FERC, *Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators* (RM18-9-000; Order No. 2222) (issued September 17, 2020).

[47] NYISO's DER participation model development preceded and informed the FERC Orders. NYISO's timeline of DER participation model development and FERC compliance filings are detailed in the Market Issues Working Group Presentation from January 27, 2022: https://www.nyiso.com/documents/20142/28052110/NYISO%20DER%202022%20-%20Overview%20&%20Strategy%20Presentation.pptx.pdf/c542a36e-ad6f-69b2-0798-f15b68ab9247.

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Completed DERMS POC and launched DERMS MVP.
- Developed project proposal and DOE funding application for the Grid Edge Lab at the Training and Learning Center ("TLC") to provide air-gapped environments for hands-on learning.
- Enhanced the DRMS to support day-ahead and near real- time programs, including the testing of industry data standards.
- Awarded a $2.3M competitive solicitation from NYSERDA to implement the ConnectDER meter collar, installing over 1,200 devices in Con Edison's service territory since 2017.
- Worked with the NYISO to launch the DER aggregation model for resources participating in wholesale and retail markets and programs.
- Collaborated with the NYISO on SD-WAN to pioneer and implement a low-cost non-remote terminal units ("RTU") solution for DER aggregator market participants registering in 2023.
- Updated standards for smart inverters to the Institute of IEEE1547-2018 specification.

Enabling DER Integration and Electrification

Con Edison's service territory currently has over 500 MW of DG and storage. The adoption of DER is critical in meeting New York's carbon reduction goals while providing direct benefits to the public, including greater customer choices for energy supply, reductions in losses, decreased reliance on local gas generation, reductions in congestion, and local economic development. Con Edison is making investments in technologies to enable deeper penetration of DER and continue to manage the grid reliably. Additionally, the Company is pursuing the automation of manual processes associated with DER interconnection, registration, and management. Finally, enhancing tools for planning and operating DER can expand hosting capacity limits, allowing more DER to interconnect in constrained areas. For instance, in Staten Island and Westchester, where there is currently limited hosting capacity, adding new DER would be cost prohibitive. More flexible interconnections could unlock some of this capacity. Investments that address these challenges and enable DER integration and electrification include the phased development of a DERMS, enhancements to the DRMS, additional M&C capabilities for DER, and the Grid Edge Laboratory at the Company's TLC.

Distributed Energy Resource Management System ("DERMS")

DERMS will provide a comprehensive view of DER assets, fully integrated with operating and planning systems, that will support better tracking and reporting on DER growth in the service territory. The purpose of a DERMS is to manage diverse DER, understand the unique status and capabilities of each, and present these capabilities to other supporting applications to facilitate enhanced M&C of the distribution system. A DERMS will provide visibility and control of a diverse portfolio of resources to address local constraints, while also flexibly addressing system-wide concerns. DERMS will start out as a planning tool and will evolve over time to add operations and market facilitation capabilities. The system will visualize, predict, and optimize DR and DG at the circuit, feeder, or segment level, and present the data in a dashboard suitable for operational use.

The Company considers the development of a DERMS in phases, starting with a POC, integrating lessons learned into a Minimum Viable Product, and then launching an enterprise solution in functional modules that enable grid edge use cases as they become prevalent.

In 2019, the Company started POC research into six foundational modules of DERMS. The approach was to build an in-house version of each module in the POC, as well as assess off-the-shelf solutions. In 2021, the Company completed its POC efforts. The Company consolidated data from multiple sources, cleaned up DG asset data, and built modules to support distribution planning and operational use cases.

Based on the POC work, the Company developed a MVP evaluation phase of DERMS. MVP DERMS work will deploy a series of eleven high value use cases:

1. Improve the hosting capacity process, analysis, and maps;
2. Increase the automation of the CESIR study process;
3. Validate DER data between the NYISO registration and utility interconnection databases;
4. Automate monthly updates to the hosting capacity maps;
5. Forecast hosting capacity constraints at a time-series level;
6. Enhance real-time power flow and distribution-level demand response modeling, incorporating DER and weather;
7. Enhance communication with DER owners/aggregators and other demand-side resources;
8. Incentivize customers to select the "best" locations with 'search and find' capabilities;
9. Automate the connection of DER status, controllability, and characteristics to load flow planning;
10. Implement push DER/inverter settings to align with seasonal operating regimes; and
11. Control grid edge assets in case of localized disruptions, maintenance, or other external adverse events

The Company has used its learnings from the POC and MVP to launch a RFP for an enterprise solution. The Company issued its RFP in early 2023 to a robust market response, receiving over ten responses and hosting five product demonstrations. An enterprise DERMS vendor will be selected in summer 2023.

Demand Response Management System ("DRMS")

Con Edison's DRMS is a mature operational system. In the 2020 DSIP, the Company described the DRMS, the customer-facing DR Portal, and how DRMS interfaces with other enterprise systems. Since the 2020 DSIP, the Company's portfolio of DR programs has grown substantially. The Company has seen an increase of over 1,400 percent in customer enrollment from 2020 to 2023 within the Commercial System Relief Program ("CSRP"), Distribution Load Relief Program ("DLRP"), Term Dynamic Load Management ("Term-DLM"), Auto Dynamic Load Management ("Auto-DLM"), and non-wires programs that the DRMS supports. As these programs continue to grow in number and complexity, they require enhancements and the flexibility to adapt to changes in tariff rules. The Company's enhancements include expanded enrollment capabilities as more residential and small commercial customers participate in aggregator enrollments. The DRMS is also a monitoring system designed specifically for DR assets. The core DRMS module allows operators to dispatch for system-wide events and location-specific events. Each DR asset and corresponding meter is individually modeled and can be dispatched as needed. New scalability enhancements have begun rolling out in 2023 to support the rapid growth of enrollments.

The development of the Term- and Auto-DLM programs, supported through the DRMS, represent a longer-term solution for DR customers. The DRMS supports the RFP-based enrollment process, notification, and performance evaluation functions for these day-ahead and near real-time programs (Term-DLM and Auto-DLM, respectively). This near real-time program requires greater responsiveness and latency in the Company's systems and telecommunications, which DRMS enhancements have provided.

In 2021, Con Edison successfully implemented a new DRMS module which automatically calculates incentive payments and sends settlement payments to the aggregator for review. This replaces manual work and allows for smoother operation of the settlements process at a large scale. The module was used for the first time in the 2022 season.

In 2022, Con Edison completed a use case utilizing OpenADR ("OADR"), "a highly secure, and two-way information exchange model and Smart Grid standard,"[48] to make dispatch OADR-ready and OADR-friendly. The use case gave the Company insight into integrating energy storage resources to leverage the OADR report services for battery telemetry. Con Edison integrated OADR into the DRMS control module. This particular module functionality supports program enrollments, validations, and event calling.[49] Con Edison continues to use industry standards, such as OADR, to provide secure communications that enhance grid modernization efforts.

Monitoring and Control Capabilities for DER

Con Edison has continued to engage with the JU and DER stakeholders to develop advanced M&C capabilities and expand these requirements to additional technologies. Additionally, the JU established a Smart Inverter Strategic Initiative to build a common understanding of smart inverter capabilities and use cases, and outline a shared approach to smart inverter integration. The Joint Utilities also continue to coordinate with the NYISO to secure the reliability of the bulk electric system, the wholesale markets, and the distribution system, and open greater opportunities to realize DER value.

Advanced M&C of DER provides operational situational awareness and allows the utility to dispatch and optimize resources based on current or forecasted system conditions. Currently, the Company uses M&C capabilities to monitor and control the operation of DER to within allowable system parameters. The Company can also use data generated by M&C for long-term purposes, such as distribution planning.

For example, through the ConnectDER pilot, Con Edison is evaluating a monitoring solution for planning use cases (with a potential evolution to control capabilities) that utilizes the cloud to collect and communicate recorded data points. The ConnectDER project is a collaborative effort between NYSERDA, ConnectDER, and Con Edison to enhance the monitoring and forecasting of solar installations within the Company's service territory. ConnectDER, a vendor specializing in solar meter collars, has been instrumental in manufacturing a collar for ease of solar installations. These meter collars provide valuable data on solar production and have been successfully deployed in the Company's territory since 2017. Building on the success of a pilot program, the installation of these meters has continued, resulting in over 1,200 NYSERDA-sponsored units installed.

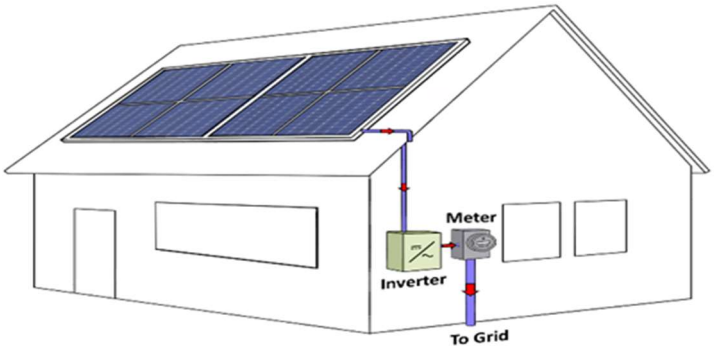
Data from this project will be processed and utilized through forecasting. The objective is to utilize solar forecasts and irradiance measurements to make hourly corrections to the system forecast. The CEFS team also ensures that the hourly solar forecast is available to system operators and the Energy Trading team. Furthermore, solar production data contributes to refining the calculations for the electric system's WAP and could be utilized to fine tune infrastructure planning for networks with significant solar capacity.

The Company has continued to collaborate with stakeholders on the use of smart inverters. Generally, smart inverters provide an economical solution to interconnection, particularly through voltage impacts. DG and other DER can increase local voltages on distribution systems, which can impact utility voltage regulators and capacitor banks and complicate utility programs that control voltage profiles on circuits. Smart inverters can help manage voltage by dynamically regulating the power factor, which helps to maintain line voltage and increase hosting capacity for future projects. For

[48] OpenADR Alliance website: https://www.openadr.org/.
[49] OpenADR Alliance Utility Case Study: https://www.openadr.org/assets/Con%20Edison%20Case%20Study_1-2022.pdf.

some scenarios and control modes, the smart inverter control may need to limit active power production for short periods to avoid impacting the voltage on the distribution system. In these scenarios, the DER developer can choose to operate within these limits, or the developer can decide to oversize the inverter to avoid curtailing generation.

Figure 9: Smart Inverter Two-Way Communication



Con Edison participated in the Joint Utilities' Smart Inverter Strategic Initiative which built a shared understanding of smart inverter capabilities and use cases, examined potential value propositions for smart inverter implementation, and outlined a collective approach to smart inverter integration leveraging IEEE 1547-2018. The SIIWG used research studies, modeling, simulations, filed demonstrations, communication protocols, and cybersecurity issues, to inform the ongoing development of a roadmap for facilitating smart inverter benefits. The roadmap represents a JU approach to integrating smart inverters by addressing the following:

- Prioritization of use cases, relevant owners/actors, and value of those use cases
- Defining functional settings for new smart inverters by utility/system type or via locational need
- Adding policy guidance within the Standardized Interconnection Requirements ("SIR") that requires smart inverter functions for utilities at no added cost
- Standardization of smart inverter requirements and functionalities in the State
- Implementing autonomous "Do No Harm" settings
- Access to monitoring, verification, and control elements

The Joint Utilities shared their initial roadmap with external stakeholders, such as the Interconnection Technical Working Group ("ITWG"), IPWG, and the NYISO, in 2020. The first phase determined bulk power system ("BPS") voltage support settings and smart inverter set-points. These settings have been incorporated into the Company's technical interconnection documents. The release of these settings was timed to align with the commercial availability of IEEE 1547-2018 compliant and UL 1741-SB certified inverters. Building on this first phase, the JU are now discussing monitoring requirements for inverter-based resources. The utilities are working on identifying the appropriate data points and field measurements that distributed resources will be required to provide. The utilities will also describe the applications and use cases that monitoring data points will help inform.

Con Edison is phasing in the implementation of IEEE 1547-2018 and 1547a-2020. For inverter-based systems, the default settings will be input on UL 1741-SB certified smart inverters interconnecting to the Con Edison electric system with interconnection application acceptance dates on or after June 1st, 2023.

The M&C advancements described above play a critical role in integrating DER into the NYISO markets. The Company is actively engaged with the NYISO to continue developing potential solutions for these M&C needs that will satisfy market requirements, system reliability, aggregator needs, and individual DER concerns described in the subsection below.

Grid Edge Tech Environment

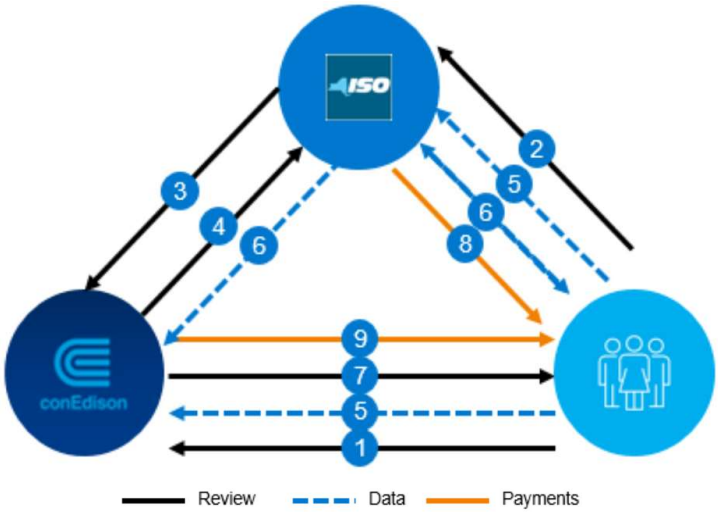
The Company has planned for additional capabilities at the TLC to test & deploy the four MVP-level use cases in a simulated environment without impacting operations. The TLC will feature sample grid-edge devices (e.g., EV chargers, smart inverters) and a simulated control center (including a representative Con Ed IT/OT stack). In the short term, it will allow Con Ed to better understand the value of the MVP capabilities the Company is building and provide the ability to train employees in a simulated environment.

Developing and applying ISO-DSP coordination mechanisms for DER market services

Con Edison continues its work with the NYISO on its DER aggregation model and open market services as required by FERC Orders 841 and 2222. This work began as a pilot between 2018 and 2020 and is currently deployed at scale in the NYISO's market services. Through the pilot and lead-up to market launch, the Company has examined the interoperability of jointly operated storage assets, tested the DSP/NYISO coordination manual, and piloted new SD-WAN technologies that will be used as a lower-cost alternative for base pointing aggregations and routing telemetry.

The SD-WAN technology retains a Distributed Network Protocol 3 ("DNP3") protocol, while providing cost-savings and reduced time for installation, testing, and commissioning to market participants (Aggregator to DCC). The Company will begin offering the SD-WAN solution in 2023. This will provide benefits including affordability, scalability, and flexibility, and will enable seamless participation for those outside of Con Edison's service territory.

Figure 10: DER Aggregation Review, Data, and Payment Interactions



Enhancing core service through safety, security, and reliability

Supporting the State's electrification efforts, Con Edison continues to focus on providing necessary infrastructure updates and improvements to meet the growing demand for safe, reliable, efficient, and clean energy.

Modernized Network Protector Relays ("MNPRs") and Supervisory Control and Data Acquisition ("SCADA")

Modernized Network Protector Relays and SCADA are high-impact, multi-value investments that offer myriad benefits to the distribution system. MNPRs enable DG or energy storage discharge to flow in the reverse direction through the network protector and for bi-directional communication with SCADA systems. As a result, the Company can monitor two-way power flow with greater certainty and offer greater flexibility to host DER. MNPRs increase available hosting capacity and enable lower-cost interconnection while providing greater grid edge visibility, which reduces the need for crews to visit locations physically. Con Edison is on track to support greater installations of MNPRs and SCADA with 600 microprocessor relay upgrades and 200 SCADA-enabled locations scheduled yearly.

Enterprise Geographic Information System ("eGIS")

Following extensive benchmarking and business case validation, the Company is in the process of implementing its Enterprise GIS, which will provide a key data feed to the DERMS. The GIS offers one consolidated mapping and visualization system that stores the physical location and displays other operating characteristics of facilities and assets, including DER. It maintains the as-built model of the electric and gas distribution systems. When fully built, it will be the backbone for the connectivity model that shares information and provides feedback across the grid and will enable the following advanced analytic capabilities when integrated with other systems:

- Integration with AMI data to forecast outage locations using predictive analysis;
- Integration with mobile spatial data for crowdsourced damage assessments; and
- Integration with unmanned aerial vehicle systems for situational awareness during emergency events.

Conservation Voltage Optimization ("CVO")

The primary purpose of CVO is to reduce energy costs and environmental impacts while maintaining acceptable voltage at all points along the distribution feeder under all loading conditions. Based on the Company's efforts implementing CVO technologies to date, the Company is on track to achieve its CVO energy savings goals. Operating the system at optimal voltages reduces total energy consumption and associated power generation emissions, resulting in significant energy savings for our customers and a reduced carbon footprint.

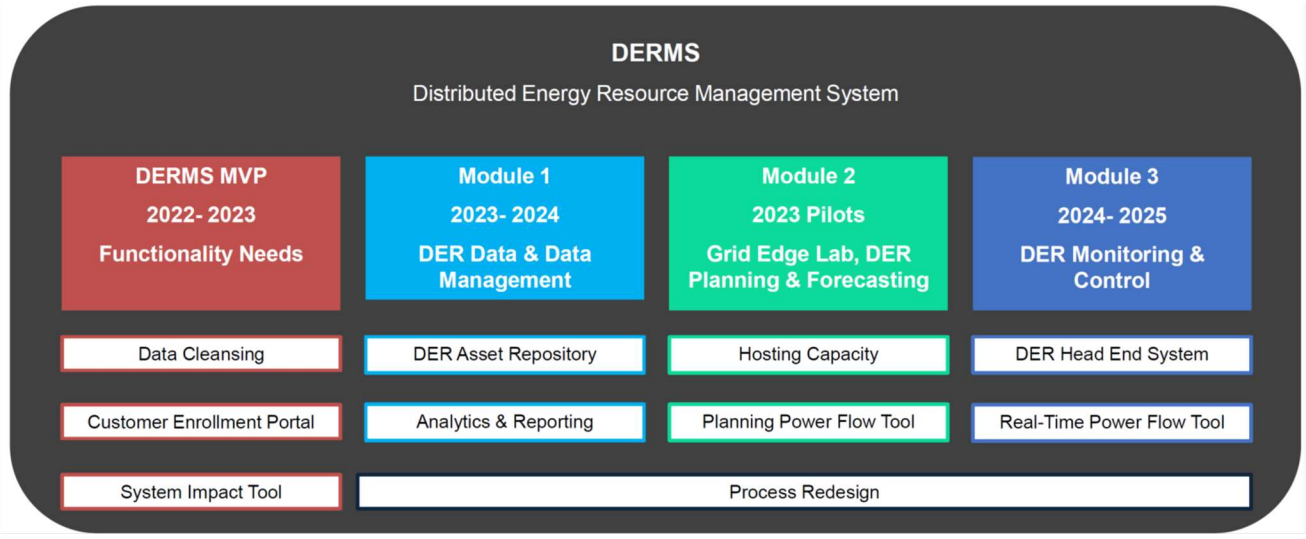
Summary of Future Actions

- Deploy DERMS enterprise solution in phased modules.
- Complete implementation of eGIS.
- Monitor the launch of the DER Aggregator model and adjust requirements/systems accordingly.
- Collaborate with the Joint Utilities, the NYISO, DPS, NYSERDA, and other industry stakeholders on evolving M&C requirements.
- Accelerate CVO schedule to achieve increased energy savings.
- Continue installation of ConnectDER meter collars.

Enabling DER Integration and Electrification

Con Edison will expand its DER integration capabilities as the development of the DERMS enterprise solution progresses. The Company is deploying its enterprise solution in a phased approach, building off the MVP. The first phase of the enterprise solution will focus on DER data and data management – building a DER asset repository, as well as analytics and reporting. The second phase will expand DER planning and forecasting functionality by integrating planning power flow tools and integrating HCA. The third phase will focus on operational M&C capabilities by deploying a DER head-end system and integrating real-time power flow tools. The sequence and timing of the deployment of these phases is shown below in Figure 11.

Figure 11: Enterprise DERMS Modules



The completion of the eGIS project in 2026 will provide the additional data sets needed for enterprise DERMS functions. Additionally, Con Edison will continue to participate in Joint Utilities' discussions on low-cost M&C of DER within planned pilots, as well as M&C solutions that are harmonized with NYISO requirements and individual utility requirements.

Similarly, the group will continue to harmonize M&C requirements and implementation across the JU in accordance with the NYISO market services and non-market-facing requirements. The effort to develop utility options for low-cost M&C and to standardize and harmonize with NYISO requirements further supports the operational and market benefits of

DER. In collaboration with the JU, Con Edison will continue to support realizing those benefits to the DER community by developing M&C requirements that support high DER penetration and are also sensitive to project economics.

The Grid Edge Tech Environment at the TLC will be leveraged to develop the next horizon of capabilities, such as advances in sensors, high-speed/volume communications, edge computing, predictive analytics, and artificial intelligence ("AI"). These findings will allow Con Edison to collaborate with community and vendor stakeholders to provide an air-gapped environment for hands-on learning and training, in pursuit of an equitable renewable transition.

Additionally, the Company anticipates continued installation of ConnectDER meter collars going forward.

Developing and applying ISO-DSP coordination mechanisms for DER market services

The Joint Utilities and the NYISO will continue to closely monitor the April 2023 launch of the NYISO's DER Aggregation model and continue to work toward full FERC Order 2222 compliance.

Enhancing core service through safety, security, and reliability

The Company will continue its annual deployment of MNPRs in areas where they offer multiple values, both reliability and increased hosting capacity.

In 2023-2025, the Company will accelerate and exceed the CVO schedule to increase the energy savings to 1.75 percent by the end of 2025. As a result, the Company will realize net energy savings and that reduce the supply side costs of the customer bill while further reducing GHG emissions.

Risks and Mitigation

Building capabilities to support advanced grid operations, including advanced M&C, will require sustained investment in grid modernization technologies. The amount of available funding will influence the timing and extent of implementation.

Additionally, cybersecurity remains of paramount importance as the grid adds digital technologies. Emerging cybersecurity concerns or requirements have the potential to impact the implementation timeline to manage risk. The Company follows cybersecurity developments as provided in the Joint Utilities' Cyber and Privacy Framework filed in the Supplemental DSIP and is actively engaged in industry discussions.[50]

Stakeholder Interface

As noted above, the JU worked with stakeholders to align on M&C requirements and potential lower-cost M&C solutions. The Joint Utilities continue to work with the DER community through the ITWG and other venues to find mutually satisfactory solutions and maintain the transparency of M&C requirements. Additionally, the JU remain active participants in the NYISO's stakeholder forums, including the Installed Capacity Working Group and Market Issues Working Group ("MIWG").

As a member of the Joint Utilities, Con Edison will continue to work with the NYISO to develop operational coordination requirements to continue the safe and reliable operation of the system while providing greater opportunities to realize DER value. The Company has also continued to participate in the Joint Utilities' ISO-DSP Coordination Working Group, which primarily focuses on the DSP operational requirements.

[50] Note 18, *supra*, pp. 148-160.

Additional Detail

This section responds to the questions specific to grid operations.

1) **Describe in detail the roles and responsibilities of the utility and other parties involved in planning and executing grid operations which accommodate and productively employ DERs.**

The utility's primary responsibility is to preserve distribution system safety and reliability, with a growing focus on creating a flexible system that is resilient to disruptions. Con Edison has coordinated with DER aggregators and the NYISO to define operational coordination requirements, including specific roles and responsibilities for each party, to preserve safety and reliability for a system characterized by increasing amounts of DER. As part of distribution system programs (e.g., DR) and procurements (e.g., NWS), the utility requires participants (e.g., DER aggregators) to sign a contractual agreement that defines the roles and responsibilities for both the utility and DER aggregator. For example, contracts typically specify the amount of advanced notification the utility will provide the DER aggregator prior to an event, and define reporting and settlement requirements for the DER aggregator.

In addition to operational coordination for DER participating as part of utility programs and procurements, the Joint Utilities have developed and refined a Draft DSP Communications and Coordination Manual[51] to define the roles and responsibilities among the DSP, the NYISO, DER aggregators, and individual DER to enable DER wholesale market participation while preserving system safety and reliability.

2) **Describe other role and responsibility models considered and explain the reasons for choosing the planned model.**

Con Edison's programs and procurements define the types of roles and responsibilities the Company, in coordination with third parties, determines necessary for effectively addressing utility needs while providing actionable information to DER aggregators and individual DER operators to help preserve distribution system safety and reliability. With respect to DER wholesale market participation, the JU coordinate with the NYISO on an ongoing basis to define the roles and responsibilities for relevant parties to facilitate DER wholesale market participation in a safe and reliable manner. Similarly, input received through the NYISO stakeholder process has informed the development of these currently defined roles and responsibilities.

3) **Describe how roles and responsibilities have been/will be developed, documented, and managed for each party involved in the planning and execution of grid operations.**

For distribution-related programs and procurements, Con Edison will continue to capture all roles and responsibilities within contractual agreements with relevant parties. The Joint Utilities continue to coordinate on opportunities to align the procurement process, which may help inform a more standardized set of roles and responsibilities across the utilities. While the high-level roles and responsibilities will generally be consistent across the different utilities' programs and procurements, the unique nature of each system need may result in differences (e.g., pre-defined time periods in which the DER portfolio is required to be available for performance).

[51] The Joint Utilities of New York, *Draft Joint Utilities DSP Communications and Coordination Manual* (updated July 2018): https://jointutilitiesofny.org/sites/default/files/JU_DSP_Comms_Coordination_Manual_DRAFT_2.pdf.

With respect to operational coordination for DER wholesale market participation, the Joint Utilities have developed a Draft DSP Communications and Coordination Manual[52] to define the coordination requirements between the DSP, the NYISO, DER aggregator, and individual DER. As DERs increase participation in the wholesale market, there may need to be enhanced coordination across four major functions: (1) registration, (2) planning, (3) operations, and (4) settlement. The Joint Utilities have also developed a Draft DSP-Aggregator Agreement[53] to: (1) close the operating and communication gap between the utility interconnection agreements or tariffs and NYISO tariffs, and (2) provide DER aggregators with transparency regarding how to coordinate with the DSP to maximize the ability of DER aggregations to deliver value across different services.

4) Describe in detail how the utilities and other parties will provide processes, resources, and standards to support planning and execution of advanced grid operations which accommodate and extensively employ DER services. The information provided should address:

a. organizations;

As discussed above, Con Edison coordinates with DER aggregators and the NYISO to define operational coordination requirements, including specific roles and responsibilities for each party, to preserve safety and reliability for a system characterized by increasing amounts of DER.

Internally, the Company maintains an extensive collection of standard operating procedures and specifications for electric system planning and operations that incorporate DER as appropriate. Con Edison is also modernizing its control centers to proactively manage a more complex distribution grid. Modernizing the control centers will bring significant enabling benefits for integrating the latest technology, resiliency, and standardization of processes, including establishing a centralized area to deploy advanced distribution management functionalities.

b. operating policies and processes;

The Company develops and maintains operating guides for Company personnel that describe the policies and procedures for performing a range of operational functions. As the Company implements new processes and functionalities, such as the Interconnection Online Application Portal ("IOAP") and hosting capacity maps, the Company integrates lessons learned from early stages of deployment into the relevant policies and procedures, as appropriate. Con Edison has established cross-functional steering committees and project teams, representative of the organizations involved in DSP activities and inclusive of the executive levels, to facilitate the governance structures necessary to institutionalize, monitor, and enforce operating policies and processes.

c. information systems for system modeling, data acquisition and management, situational awareness, resource optimization, dispatch and control, etc.;

Con Edison is committed to building the systems and functionality that maximize the integration of DER assets into utility operations. For example, as part of the DERMS POC, the Company built out communications functionality in its common information model ("CIM"), which provided a uniform interface definition language to communicate with internal and external resources. Bringing in additional grid endpoints will require further investment in SCADA technologies and communication infrastructure to maximize the value of the investment. The Company maintains an overall strategy to meet communication requirements across multiple criteria. This communications strategy delivers

[52] *Ibid*.

[53] Joint Utilities of New York, *Draft Joint Utilities DSP-Aggregator Agreement for NYISO Pilot Program* (updated July 2018). https://jointutilitiesofny.org/sites/default/files/Draft_JU_DSP_Aggregator_Agreement_NYISO_Pilot_Program.pdf.

sufficient capacity and diversity of communication channels in advance of planned device deployment, while also addressing cybersecurity and other operational requirements.

To accommodate future systems, applications, and devices, the Company will expand or enhance existing communications infrastructure to meet the needs of each asset. This infrastructure expansion will span a 20-year horizon in alignment with Con Edison's Grid Modernization Plan. The Company's efforts to gather system, application, and device requirements informed the determination of optimal communications solutions.

The need to incorporate DER assets into traditional operations will necessitate the integration of new DERMS and ADMS functionality in more modern control center environments. Additionally, GIS is foundational to DERMS and ADMS and helps provide a holistic view of how DER fits into the overall system. Modernized control centers will require a suite of situational awareness tools to allow operators to analyze and react to inputs from both utility-owned assets and third party equipment. The Company has built a solid foundation for modern control centers, with SCADA-enabled network protectors and fault-interrupting switches, which will support DERMS and ADMS functionality. However, the unique characteristics of Con Edison's system, particularly the secondary mesh networks serving New York City, present challenges to fully preparing the control centers for DERMS, potentially requiring significant additional evaluation and resources. For example, grid-level solutions that leverage distributed intelligence may assist operators when system issues cascade rapidly.

d. data communications infrastructure;

The Company understands that streamlined data management and optimization will underpin the future of utility operations and as such, the Company has procedures and roadmaps in place to layer these needs into a corporate repository that can serve as a single source of data and reporting. For example, as part of the ongoing AMI deployment, Con Edison has established data governance teams and structures to facilitate an enterprise-wide approach to data management and the creation of an Enterprise Data Analytics Platform ("EDAP"). The Company has also developed a hierarchical approach to data management and communications to facilitate decisions regarding the safe and reliable transfer of data assets for a wide range of use cases. The Company is committed to working with the Joint Utilities and the NYISO on the development of advanced information and data portals that will continue to streamline the coordination process.

e. grid sensors and control devices; and

As technological advances bring new sensing and communication capabilities, Con Edison will leverage these advancements to support integration of higher penetrations of customer-owned and operated assets. The Company has and will continue to deploy smart sensors throughout the system. These sensors have already led to the detection and correction of numerous defects on the electrical distribution system, resulting in improved employee and public safety. In the years ahead, the diversity and volume of sensors will only compound this benefit. These data points will allow Con Edison to remotely perform many activities that currently require onsite labor, a capability that will provide greater workforce flexibility and lower costs over time. As DER penetration levels continue to increase, grid sensing equipment will offer a more complete look at the impact customers will have on the grid, allowing the Company to continue to incentivize electric generation and demand in a way that brings the highest value with the greatest reliability. Additionally, investment in SCADA communications and technology will offer operators a wider range of control that will lead to faster system response times and a wider range of operational flexibility.

f. grid infrastructure components such as switches, power flow controllers, and solid-state transformers.

As noted in the responses to "4c)" and "6c)" in this section, the Company is investing in equipment that supports system reliability in a high DER environment. These investments build on ongoing efforts to reduce the impact of storms,

including installing additional automatic devices, such as reclosers or gang switches, fuses, fuse bypass switches, and automatic sectionalizing switches on the overhead system.

Investments in network protectors with communicating relays that are capable of two-way wireless communication allow for SCADA, which provide control centers the ability to remotely monitor and operate the network protectors, allowing more dynamic ability to load and de-load specific feeders. In addition to timelier fault identification, the MNPRs also enable soft transfer trips in which, upon a feeder fault, a customer breaker or network protector is opened. Soft transfer trips, executed automatically and in near real-time, de-energize the backfeed on feeders to protect both customer and utility equipment and the safety of Con Edison field workers. As DER penetration increases, the risk to worker safety and equipment damage due to backfeed increases, and more granular distribution control becomes a priority. By modernizing the network protective relays in prioritized areas (e.g., where DER penetration is greatest or the system is most constrained) and in a pre-emptive manner, the Company is maintaining the system reliability and resiliency while integrating more DER into the electric system.

Power flow controllers and solid-state transformers are emerging technologies currently in the research and development ("R&D") phase. As such, these technologies are not part of the current investment plan. The Company continues to explore new technologies in a demonstration project or research and development capacity, as appropriate.

5) Describe the utility's approach and ability to implement advanced capabilities:

a. Identify the existing level of system monitoring and distribution automation.

Con Edison currently has a significant level of monitoring for utility-owned assets on the distribution system. Con Edison monitors approximately 27,000 distribution transformers on the network system via the Net Remote Monitoring System ("RMS"), along with SCADA communications for area substation circuit breaker and transformer equipment. The Company uses these data streams for both real-time monitoring as well as an historical input to circuit models for load flow and planning cases.

In addition to the RMS on the distribution network transformers, Con Edison monitors the network protectors on the secondary side of these units. The Company is able to remotely control a portion of these locations through the SCADA system and plans to increase this capacity over time through capital investment that will be strategically located in areas where the Company implements NWS projects or DG penetration levels exceed network thresholds.

Additionally, the installation of AMI infrastructure throughout the service territory will increase grid visibility from the network transformer level to the service delivery point offering.

The Con Edison overhead system incorporates loop designs with alternate circuit feeds that will operate to segment feeders and restore load through relaying. Con Edison can operate some through remote operation. Currently, Con Edison has over 2,000 monitored reclosers on the overhead system.

b. Identify areas to be enhanced through additional monitoring and/or distribution automation.

As the Company expands AMI deployment and has increased availability of granular network data, it will be able to improve existing planning models. This will allow grid operations use cases to be more inclusive of DG penetration and help guide M&C investments to coincide with the most needed areas in the distribution grid.

The phased implementation of a DERMS and ADMS will be a significant driver for monitoring, control, and distribution automation. Con Edison will use these systems as the optimization engines to fully integrate DG operation into traditional grid management. These systems will require significant M&C data points from the utility grid and third party

DER assets that will be available to provide grid support. Con Edison has actively participated in the Joint Utilities' efforts on lower-cost M&C initiatives and will continue to invest in solutions that provide the necessary operational information without impeding DG projects.

As the Company looks to the future and continues to expand grid visibility and utility distribution automation, there will be a need to consolidate older systems into more modern, flexible technologies that are capable of marrying tremendous amounts of disparate information into a complete model of the real-time system. To meet future needs, the Company will need these systems to consolidate broad skill sets in both planning and operations. Con Edison will look to both modernize and consolidate control center locations and functionality so it can deploy the full benefits of future systems (e.g., DERMS, ADMS) across the service territory.

Additionally, as volt/VAR optimization ("VVO") efforts increase, there will be further ability to control voltage profiles by having more monitored and controlled end points.

c. Describe the means and methods used for deploying additional monitoring and/or distribution automation in the utility's system.

Communications channels and functionality will continue to grow as a result of the Company's grid modernization efforts, as it is a key component of future operations. For example, Con Edison currently is engaged in a multi-year project focusing on equipping existing network protectors with newer model relays and SCADA functionality. The relays allow for more backfeed in the secondary network, while SCADA enhancements give operators the ability to remotely operate the protectors. The goal of this project has been to target areas with existing or projected DG penetration growth to facilitate a network topology that is more accepting of network backfeed under low load conditions.

In the near term, the Company is increasing the number of switches on the overhead system and enhancing Distribution Automation capabilities. The Company also plans to continue to increase automation on the overhead distribution system and is able to support operational actions that will offer a greater level of flexibility during system events. Con Edison will make these types of investments as part of the Company's overall grid modernization strategy, which will target areas that would receive the greatest benefit from automated operations.

The Company also recognizes the need to monitor and, in some cases, control third party owned DG. The Company's investment in DERMS capabilities will expand this functionality. Con Edison will explore cost-effective ways of backhauling data for optimization and operational decisions.

d. Identify the benefits to be obtained from deploying additional monitoring and/or distribution automation in the utility's system.

Expanded monitoring across the system will enable planners and operators to optimize the value of utility and non-utility owned assets. This co-optimization will lead to more informed operational decisions and capital investments that will drive customer benefit. In addition, the ability to trend data over time will refine the ways the Company is able to offer value streams to the DG community (i.e., NWS, Locational System Relief Value ("LSRV"), and market facilitation).

Similarly, an increase in distribution automation, through DERMS investment, will increase operational flexibility and continue to advance Con Edison's ability to provide safe and reliable electric service while incorporating greater levels of system value and support from DER.

e. Identify the capabilities currently provided by Advanced Distribution Management Systems (ADMS).

Con Edison does not currently operate an ADMS system. However, the Company operates a suite of systems that can perform some of the core functionalities characteristic of an ADMS system (e.g., fault location, Outage Management

System ("OMS") modeling, and SCADA interfaces) and many of the Company's planned grid modernization investments, such as GIS, will support ADMS functionality. For example, the Company's investments in hardware such as SCADA-enabled switches for non-network locations, SCADA-enabled MNPRs, interrupting switches for network locations, and pole top regulators, as well as enhanced models and real time load flow capabilities, provide a robust foundation for a total system ADMS.

f. Describe how ADMS capabilities will increase and improve over time.

Con Edison plans on utilizing a phased approach to grid modernization where it can incorporate new functionality as DERMS and ADMS software become more mature. As discussed above, currently, the Company does not have an ADMS in the traditional sense but achieves ADMS-like functionality through a suite of systems. The Company plans to leverage software solutions it possesses and will procure for specific needs in the near term, to pilot the future development of modern tools that the Company can successfully integrate into its operational environment. The Company will have a five-step approach, as follows.

(1) Continue building out ADMS hardware functionality for all network topologies at CECONY;
(2) Focus on improved models of all system assets;
(3) Test out ADMS schemes based on real world needs, such as unavailability of DER assets;
(4) Explore distributed intelligence as a way to mitigate constraints; and
(5) Continue building business rules for M&C needs as DER penetrations increase.

g. Identify the capabilities currently provided by DER Management Systems (DERMS).

Please refer to the use cases described above in the DERMS subsection of the Current Progress section above.

h. Describe how DERMS capabilities will increase and improve over time.

Please refer to the discussion on the phased approach to building modules in the enterprise DERMS solution in the Future Plans section above.

i. Identify other approaches or functionalities used to better manage grid performance and describe how they are/will be integrated into daily operations.

Con Edison will continue to use lessons learned from demonstration and pilot projects to prove out the conceptual elements that the Company will need to advance grid operations in the future. The Company sees this as a necessary environment to partner with leaders in technology development to refine the Company's software and technology roadmap as the Company moves closer to full DSP functionality. These lessons learned will facilitate de-risked investments that the Company can phase into grid operations.

2.4. ENERGY STORAGE INTEGRATION

Context and Background

Energy storage integration was first introduced in the 2018 DSIP, which focused on Con Edison's early development and integration of a portfolio of ESS in the form of REV demonstration projects. This version of the DSIP also highlighted the Company's early work on the Energy Storage Roadmap, initially launched in June 2018 and centered on developing market mechanisms, policies, and funding programs. The 2020 DSIP expanded on this body of work, describing how Con Edison facilitated storage deployment on its system, both on the customer side, BTM, and the utility side, front-of-the-meter ("FTM"). The Company continued to implement energy storage projects through 2022 to further develop the market. Efforts included considerable updates to tariffs such as the VDER tariff and dual participation rules designed to capture numerous value streams in the NYISO as a standalone resource in the energy storage resource ("ESR") program or as part of an aggregation in the DER program.

Energy storage will significantly increase the utilization of renewable resources by storing excess intermittent electric supply during periods of over-generation. This use of storage avoids stranded energy and provides additional resources to serve peak demand needs. The State anticipates exponential growth in large-scale renewables and storage across the bulk and retail sectors. At the bulk level, storage supports OSW and utility-scale PV projects due to its ability to buffer generation intermittency, eliminate curtailment, provide dispatchable power, and minimize transmission system upgrades. The commitment to develop 9 GW of OSW will impact the necessity for additional storage resources by 2035.

At the retail level, when paired with distributed solar PV, battery storage can provide peak shaving and demand relief system support to absorb power during increased customer solar output periods or reactive power support. Declining PV technology costs and the ability to capture additional revenue by participating in wholesale energy markets and retail programs will continue to spur the combination of solar plus storage projects. Distributed solar must reach at least 10 GW by 2030 to continue advancing statewide climate goals.

In the longer-term, long-duration storage – assets capable of storing energy for many hours, days, or weeks – will further enable a decarbonized energy supply. The primary role of long-duration storage is to provide power during infrequent but critical multi-day periods when electric demand is high and when contributions from renewables and other resources are not sufficient to meet demand. Long-duration storage will be increasingly important as electrification of building heating adds to winter loads, as winter months often coincide with periods of low renewable output.

Enacted in 2017 and amended in late 2018, Public Service Law ("PSL") §74[54] directed the Commission to establish a statewide energy storage goal and support programs to enable the State to reach its storage target. In December 2018, the Commission opened an Energy Storage Proceeding and adopted statewide storage goals of 3,000 MW by 2030, with an interim target of 1,500 MW by 2025.[55] The policy landscape for energy storage targets has continued to evolve in pursuit of the state's industry-leading goals. Governor Hochul announced a goal to deploy a total of 6,000 MW of energy storage by 2030 as part of the 2022 State of the State Address. The Governor's target doubled the 3,000 MW energy storage goal established in the Storage Order. The increase in capacity targets has been driven by the earlier achievement of interim milestones. In October 2022, 87 percent of the 2025 target had been achieved.

[54] Public Service Law §74 – Energy Storage Development Policy: https://www.nysenate.gov/legislation/laws/PBS/74.
[55] Case 18-E-0130, *In the Matter of Energy Storage Deployment Program* ("Energy Storage Proceeding"), Order Establishing Energy Storage Goal and Deployment Policy ("Storage Order") (issued December 13, 2018).

The New York State Energy Research and Development Authority and DPS staff developed roadmaps for the initial 3 GW target and the expansion to 6 GW ("Storage Roadmap 1.0"[56] and "Storage Roadmap 2.0",[57] respectively). These roadmaps outline deployment opportunities, use cases, and implementable actions the State and various market actors can undertake to accelerate the deployment of high-value storage applications. The Storage Roadmap 2.0 identifies efforts to cost-effectively procure the 4.7 GW storage deficit between current energy storage deployments and the 6 GW target, highlights storage deployment progress, and outlines program options for bulk storage and retail and residential sectors. It also proposes continuing and expanding existing programs for the retail and residential sectors, specifically the retail Storage incentive to procure a further 1,500 MW of retail storage by 2030 and launching a statewide residential energy storage program. The residential program, currently only available to solar plus storage projects on Long Island, would be expanded to a statewide program, and would fund up to 200 MW through upfront incentives to drive down the project's price to consumers.

Additional federal incentives will further bolster the State's storage deployments. An investment tax credit ("ITC") is available for standalone energy storage projects with a capacity of at least 5 kWh. Under the IRA passed in August 2022, systems placed into service after January 1, 2023, are eligible for benefits previously reserved only for storage assets paired with solar.

Con Edison remains committed to supporting the CLCPA clean energy goals by integrating a portfolio of energy storage solutions at all levels of the power grid, from bulk power to the distribution system. The Company is pursuing a balanced approach that provides benefits for all customers and minimizes overall bill impacts. These benefits include allowing the Company to better manage peak load in constrained areas, enabling more efficient and resilient operations, increasing the hosting capacity of distribution circuits, and increasing flexibility in light of the influx of intermittent resources onto the system.

In addition to complying with Commission directives, Con Edison has significantly increased the amount of storage on its system, both customer-owned and on the utility side. As of March 31, 2023, customers have installed and interconnected 499 ESS projects with a total capacity of approximately 25 MW. Con Edison has installed and interconnected approximately 2 MW of utility-owned storage.

[56] *Ibid*.

[57] Energy Storage Proceeding, *New York's 6 GW Energy Storage Roadmap Policy Options for Continued Growth in Energy Storage* ("Storage Roadmap 2.0") (filed December 28, 2022).

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Increased the amount of storage on the system, including distribution-connected batteries representing approximately 25 MW of capability, as of March 31, 2023.
- Contracted the largest bulk storage project in Company territory to date – a 100 MW/400 MWh project on a brownfield power plant site in Astoria, Queens.
- Held annual bulk market solicitations in 2021 and 2022.
- Adjusted buy-back and VDER tariffs for retail, distribution-connected ESS projects and filed a wholesale distribution tariff for projects participating in NYISO markets.
- Fully operationalized the 7.5 MW ESS at Fox Hills, capable of providing power to approximately 3,000 homes up to four hours.
- Operationalized an industry-leading EPCM model that leverages the cross-functional expertise of the utility organization and uses Local 3 operators for ongoing operations and maintenance.
- Developed additional utility-owned demonstration, substation-sited, and NWS projects to provide localized benefits and test market earning potential, with revenues returned to ratepayers.
- Maintained three commercial battery storage demos, representing 1 MW each since 2020, providing peak-load relief, with a fourth in development.
- Continued successful operation of utility-owned and customer-sited solutions as critical components of NWS portfolios.

Energy storage plays a critical role in the clean energy future. Con Edison continues to actively engage with DPS Staff and NYSERDA to support energy storage policy goals and incentive development. The Company's storage efforts have been diverse and robust, applying a three-prong approach to deploying energy storage:

- Contracting with larger bulk storage systems interconnected at higher voltage levels
- Constructing and operating utility-owned projects, typically installed at or near Con Edison substations
- Targeting incentives and programs to encourage customer-owned systems to be interconnected to the distribution system

Contract with Larger Bulk Storage Systems

Contracting with third party, larger bulk storage systems at higher voltages allows the Company to leverage the voltage support that greater storage capacity provides. Con Edison continues to encourage third party owned storage deployments through its bulk solicitation. The project types engaged include facilitating energy storage with EV charging, storage with solar generation, and developing M&C mechanisms.

In July 2019, Con Edison conducted its first solicitation, seeking 300 MW of dispatch rights from ESS with capacities of at least 5 MW each. This initial solicitation resulted in the largest winning project amongst the JU, with a 100 MW/400 MWh battery storage project located on the land of the former Poletti Power Plant. In 2021, the Company conducted another solicitation; however, no projects were selected from this solicitation. On December 21, 2022, the Company released an RFP seeking offers for at least 200 MW of energy storage projects connected to the T&D system capable of

individual, direct participation in the NYISO markets.[58] Projects must be capable of acting as a standalone asset regardless of whether it is co-located with a generation asset and must be operational by December 31, 2028. Con Edison will bid these assets into the wholesale market and retains revenues. This procurement model reduces merchant risk for developers and reports realizable revenues to the market to encourage future storage developments as developers include this value stream in financial planning and pricing.

Construct and Operate Utility-Owned Projects

Utility-owned projects provide the opportunity to balance the intermittent generation of renewable resources like solar and wind. In addition, they allow the Company to manage system peaks better and increase the hosting capacity of distribution circuits to integrate DERs. The Company has been deploying projects to demonstrate how distributed FTM can be used to meet T&D system needs, earn wholesale market revenue to offset customer costs, and increase the market size of participating customers by aligning the interests of the Company, customers, and third party developers.

The Company is developing several utility-owned projects sited on Company substation property. Con Edison will install a 7.5 MW/30 MWh lithium-ion storage system at its Fox Hills substation in Staten Island. Additionally, through funding secured in the most recent rate proceeding, the Company has begun the development of four additional projects. These five projects are summarized in the table below, and total 33.7 MW and 134.8 MWh of energy storage capacity, respectively. Collectively, these projects will enable clean energy generation and address power quality challenges that traditional equipment does not address efficiently. These projects will also help advance new business models and expand market participation in the NYISO, returning earned revenue to ratepayers.

Table 2 summarizes the Company's current energy storage projects focused on market development.

Table 2: Con Edison's Energy Storage Projects

Project/Program Name	Description	Battery Rating (MW/MWh)
Fox Hills ESS	Con Edison recently completed construction on an 11-container battery storage site intended to provide peak shaving, demand relief, and system support to absorb power during periods of high customer PV output and replace temporary fossil generators needed during system contingencies.	7.5 MW/30 MWh
Cedar Street Substation	Con Edison is developing an innovative, first-of-its-kind direct current ("DC")-bus system to pair DERs and improve the interconnection process for Community Distributed Generation ("CDG") and microgrids. This project will enable EV charging during power outages along the I-95 corridor.	3 MW/12 MWh

[58] Con Edison Bulk Energy Storage RFP website: https://www.coned.com/en/business-partners/business-opportunities/bulk-energy-storage-request-for-proposals.

Fresh Kills Substation	This feeder-connected project will reduce peak demand to support rapid load growth in the Fresh Kills network. The system will also provide voltage support and demonstrate the ability to offset the need for mechanical tap changes on the transformers to achieve higher voltages during specific contingencies.	11.6 MW/46.4 MWh
Glendale Substation	This asset will serve disadvantaged neighborhoods in the Maspeth Network and provide voltage support and quick load ramp-up to accommodate the high penetration of intermittent PV-based generation in the area and associated rapid evening load ramping.	5.8 MW/23.2 MWh
Brownsville Battery	This substation-sited project located in a DAC will primarily be used for load relief, peak shaving, and reliability purposes. A secondary application for this asset is for wholesale market participation.	5.8 MW/23.2 MWh

The 7.5 MW/30 MWh Fox Hills ESS, located next to Con Edison's substation in the Rosebank neighborhood of Staten Island, furthers the Company's clean energy goals and meets distribution needs. By siting the system at an existing substation, the project took advantage of property that the Company owns. This solution manages emerging duck curves due to increased PV while utilizing a restricted sites in a constrained territory. This system could also be used for market participation. Restricted sites within substation boundaries impose strict requirements during construction and subsequent operations and maintenance; however, it is essential in areas with limited available land for storage development. The Company will operationalize this system in 2023.

The other projects are approved and under development. The Cedar Street project testing the DC-bus system was approved as a demonstration project, while the Fresh Kills and Glendale systems were approved as part of the 2022 rate case. Most recently, the Brownsville battery has been approved as part of the utility solutions of the BQDM Program, which will be operational by summer 2025.

To efficiently develop, build, and operate these utility-owned ESS projects, Con Edison has developed an industry-leading EPCM model. The Company uses a cross functional team, including resources from program design, engineering, legal, supply chain, substation planning, construction services, protective system testing, environmental health and safety, training, and system operations. This model brings projects from ideation through construction to execution. Once operational, the Company leverages operators in the local trade unions to maintain system safety, issue work permits, manage and respond to alarms, and perform switching.

Encourage Customer-Owned Systems

Customer-owned storage systems offer many benefits to customers and the electric grid. For example, customer-sited storage offers customers a source of backup power and enables them to take advantage of time-of-use (“TOU”) rate structures. Customer-owned storage also contributes to system-wide storage goals, ultimately enabling optimal use of renewable generation. The Company recognizes that customer-owned storage is a growing use case with barriers to

overcome before they are adopted at scale. The sections below highlight the projects and other actions Con Edison is taking to engage with stakeholders to overcome these technical and logistical barriers.

Demonstration Projects

Through numerous REV demonstration projects, Con Edison is evaluating new business models, third party partnerships, and innovative technologies. These projects increase knowledge sharing through valuable lessons learned and serve as a vehicle for reducing technical barriers. In conjunction with these efforts, the Company continues to focus on expanding wholesale market participation for energy storage. Table 3 summarizes the Company's current energy storage demonstration projects working towards advancing market development.

Table 3: Current Con Edison Demonstration Projects Improving Storage Economics

Project/Program Name	Description	Battery Rating (MW/MWh)
REV Demo: Commercial Battery Storage	Con Edison has contracted with GI Energy (now Endurant) and Smarter Grid Solutions for distributed FTM batteries to meet distribution system needs through peak load relief and participate in wholesale markets. This model also assesses "dual" participation. The project includes three sites: Caddell, City Island and Woodside. These sites are commissioned, and the Company is currently addressing permitting questions from New York City's Fire Department ("FDNY") and Department of Buildings ("DOB").	Three sites, each 1 MW/1 MWh

Targeting Storage for Distribution System Needs

Con Edison has also expanded opportunities for energy storage to participate in T&D deferral programs and provide distribution value through continued and enhanced NWS procurements and substation-sited storage implemented through competitively sourced third party storage vendors. Non-wires solution solicitations have been effective at procuring storage to assist with distribution system load relief needs. Past solicitations have invited innovative solutions, including advanced technologies such as energy storage, advanced controls, and DG.

Given its operational flexibility, energy storage is an often-used technology in NWS proposals. For example, the Company continues to implement energy storage technologies aimed at reducing peak demand as part of the BQDM Program. The Company launched its Prescriptive Energy Storage Incentive Offering in order to provide 15 MW of additional load relief by summer 2026, offering incentive rates for grid-connected and load-following systems. Section 2.13 provides specific details on the BQDM Program and NWS.

Reducing Technical Barriers

In concert with the Joint Utilities, Con Edison has supported the development of SIR revisions that facilitate the interconnection of up to 5 MW of energy storage. This includes releasing technical documents addressing the treatment of energy storage and guidelines for solar plus storage installations. Improvements to the interconnection process are providing enhanced value to developers and facilitating technical improvements by allowing viable projects that pass the state-developed screens to advance to interconnection quickly or using screening results to verify the need to perform a detailed study quickly. Additional details on the interconnection process can be found in Section 2.11.

Con Edison has also worked closely with New York City and other municipalities in its service territory to define rules for battery installations that balance safety with the expectations of future battery growth. Con Edison continues to support the Mayor's Office of Sustainability, DOB, FDNY, and Department of City Planning on standardized siting and permitting processes for energy storage in outdoor installations. Con Edison also participated in developing the FDNY COF certification program and received a COF for Ozone Park personnel. The Company hazmat team further joined several other city agencies including FDNY, the United States Army, and the Federal Bureau of Investigation ("FBI") for an emergency preparedness drill – the first of its kind focused on energy storage – at Ozone Park.

The Company's innovative demonstration projects are also providing first-hand experience for technical and academic research. The Company partnered with the City University of New York ("CUNY"), which showed that BESS smart inverters, with the appropriate filtering elements, can provide reactive power (VAR) support without degrading the lifetime of the battery.[59] Through the Cedar Street project, the Company is also testing how a DC-bus between the ESS and solar PV generation and EV charging infrastructure can provide efficiency benefits. The value of this approach is further illustrated in a collaborative paper published with EPRI in 2023.[60]

Increase Access to Value Streams and Enable Wholesale Market Participation

The Company has taken several actions to update its tariffs to enable greater participation in storage and quicker access to value streams. Notably, the Company updated its SC 11 Buy-Back tariff to allow export on the secondary network and to compensate generators under 5 MW for their wholesale capacity value.

The VDER tariff has created new markets for individual and hybrid storage paired with BTM renewable energy systems up to 5 MW in size. The Company's VDER tariff promotes grid export by compensating resources for actual hourly energy output with multiple concurrent value streams. The VDER rates are valued at avoided costs and include hourly energy prices, capacity, and avoided T&D. Hybrid systems paired with BTM renewables can elect compensation under one of four different technical configurations and corresponding rates. When charged exclusively by renewable technology, hybrid storage systems can also be eligible for a renewable energy credit. Additionally, paired storage can participate in the Company's Community Distributed Generation ("CDG") Program and receive added incentives. The Phase Two VDER rates, implemented by the Company in June 2019 and currently in effect, provide greater revenue certainty that aligns with the typical life of a storage asset. Due to these changes, the Company has seen growth in paired and standalone storage interconnection requests.

Federal Energy Regulatory Commission Order No. 841 enabled storage resources to participate in both the wholesale energy market and as a distribution resource and FERC Order No. 2222 allows for aggregations of DER to participate in wholesale markets.[61] FERC 2222 effectively removed barriers for DERs to participate in the regulated wholesale markets. One of the overarching principles of FERC 2222 is that dual participating customers must not receive compensation concurrently for the same service, such as compensation received for the sale of energy and capacity, in the retail markets that they are receiving in the wholesale markets. On March 17, 2023, the New York PSC approved Con Edison's tariff proposals to preclude dual market participants from receiving duplicative compensation in both wholesale and

[59] Mohamed, Ahmed, *Final Report: Use of Battery Systems for VAR Support in Con Edison's Distribution Network/Substation*.
[60] EPRI, *Direct Current Coupled Solar, Storage, and Electric Vehicle Charging: A Feasibility Analysis at Consolidated Edison's Cedar Street Substation* (published March 29, 2023).
[61] Case 22-E-0549, *In the Matter of the Federal Energy Regulatory Commission ("FERC") Order Nos. 2222 and 841, to Modify Rules Related to Distributed Energy Resources*, Tariff Proposal Pursuant to FERC Order Nos. 2222 and 841 (filed September 30, 2022).

retail markets concurrently and implement other conforming changes in connection with the NYISO's Implementation of FERC Order Nos. 841 and 2222.

Similar to the overall intent of the NYISO's provision to prevent double counting of services, the Company proposed revisions to clarify customer eligibility to participate in its DER retail programs when such DER also participates in the NYISO markets. In addition to avoiding duplicative compensation issues, the Company seeks to maximize dual participation opportunities for customers by proposing a new option for the VDER or ("Value Stack") customers. This would allow customers to receive payment for the energy and capacity from the NYISO but continue to be eligible to receive the applicable VDER non-energy and non-capacity compensation from the Company. Customers can calculate their VDER credits using Con Edison's Value Stack Calculations.[62] This new option, known as the Wholesale Value Stack ("WVS"), is identical to the VDER except – unlike VDER customer-generators – WVS customer-generators will receive energy payments and capacity payments, as applicable, from the NYISO either directly or through aggregation instead of payment from the Company. Shifting the energy and capacity payment source to the NYISO prevents duplicative compensation and provides customer-generators additional optionality if they elect to participate in the NYISO markets.

Future Implementation and Planning

Summary of Future Actions

- Evaluate the 2022-2023 bulk energy storage RFP results and award projects, as appropriate.
- Coordinate with DPS Staff and NYSERDA on future bulk solicitations.
- Continue development of utility-owned projects at substations and demonstration projects.
- Continue collaboration with stakeholders to increase the efficiency and transparency of required processes to build and interconnect ESS.
- Continue to pursue opportunities for utility-owned ESS projects, including distribution-connected battery systems.
- Advance business model projects and gather lessons learned to reduce operational and market barriers and develop additional opportunities for energy storage, including capacity projects for distribution-connected batteries.
- Continue development of NWS opportunities to align with the Energy Storage Order.

Con Edison will continue to support and meet the State's energy goals through a portfolio of solutions and approaches that leverage energy storage across multiple use cases.

Contract and Schedule Bulk Storage Systems

Con Edison will continue to use competitive solicitations to procure utility dispatch rights to ESS. In the immediate future, this entails evaluating RFP responses and awarding contracts where they meet evaluation criteria. Con Edison will apply lessons learned through these efforts to future market solicitations. As the contracted assets become

[62] Con Edison Value Stack Calculations: https://cdne-dcxprod-sitecore.azureedge.net/-/media/files/coned/documents/save-energy-money/using-private-generation/specs-and-tariffs/value-stack-calculations.pdf?rev=695a141d852441f9a6a39cf9cb046564&hash=50042B6336AA20B4F056246CB79C2D22.

operational, the Company will begin to bid the assets into the wholesale market and also use them for distribution needs if they are sited on the distribution system.

Construct and Operate Utility-Owned Projects

Con Edison will continue to operate the utility-owned Ozone Park BESS and Fox Hills BESS. Additionally, the Company will continue its design and construction work for the Cedar Street demonstration project, and the Fresh Kills and Glendale substation projects. These projects are all expected to be online by 2025.

As part of the existing BQDM program, the Company is developing the Brownsville Energy Storage project. The Company will complete system design work in early 2024 and construction in early 2025, targeting site operations by June 2025. The Company is also launching a pilot project to reduce strain on distribution transformers by smoothing the daily electricity peaking cycle and provide localized resiliency benefits during low-frequency, high-impact events. This pilot will install four pole-mounted ESS on a long feeder run or loop in the overhead part of the system in a DAC. Engineering, procurement, and installation work for this pilot will be completed between summer 2023 and summer 2024. The Company will continue to monitor locations where utility-owned energy storage can provide system relief or encourage greater market participation.

The Company is also closely monitoring the value energy storage can provide to the transmission system (known as "Storage as a Transmission Asset" or ("SATA")). The Storage Roadmap 2.0 highlighted the expanded role energy storage could play as an asset on the transmission system to inject or absorb power to increase line utilization and efficiency and stabilize power flows. [63] Con Edison will collect data and review use case studies that demonstrate the value of SATA.

Encourage Customer-Owned Systems

To help create a streamlined and transparent process for developing ESS, the Company will continue participating in the Joint Utilities' ITWG, and other industry forums and collaborations across the State. In addition, Con Edison will continue its business model projects to test different operational and business models that can promote expanded opportunities for energy storage. The Company feeds the lessons learned from its projects back to industry stakeholders to further market opportunities for storage.

The Company will seek to build on the experiences of the NWS Program to encourage and support the development of ESS where and when these resources provide the most value. Con Edison will continue to enhance processes to increase opportunities for ESS to serve the distribution grid, including identifying cost-effective opportunities for energy storage to reduce customers' total bills in NWS areas. In addition, the Company will continue identifying new distribution and wholesale market revenue streams from DER participating in NWS and refining future NWS market solicitations to provide storage developers additional information related to interconnection processes and potential costs.

Risks and Mitigation

Risks that could affect the timely implementation of higher levels of energy storage include permitting, accessing the NYISO markets, operational challenges in capturing multiple value streams, continuing general high costs of storage, NYC specific installation costs, and the complexity of installing storage in a highly dense urban environment. The Company will continue its work with municipal authorities and other stakeholders to streamline and clarify the processes for permitting, building, and interconnecting energy storage.

The Storage Roadmap 2.0 underscored challenges driving up the costs associated with storage technologies, including global supply chain limitations and competition for storage materials, such as lithium-ion, used in EV battery production.

[63] Note 57, *supra* p. 36.

Prolonged cost increases could impact the overall project cost for storage procurement programs. Additionally, incentive mechanism design and the requisite time for implementation could induce hesitancy to adopt retail, residential, or bulk storage technologies. Con Edison is working closely with the Joint Utilities to study and identify the potential for energy storage projects that provide cost-effective, non-market T&D services. The Company also proposed new tariff language in March 2023 to clarify "dual" participation storage in light of FERC 2222.

Stakeholder Interface

While ESS are increasing nationwide, they lack an extensive operational track record for large-scale commercial deployment in conjunction with electric distribution systems. Con Edison has worked with several stakeholder groups to reduce financial and technical barriers to energy storage. The Company actively engages developers through the Joint Utilities' stakeholder engagement groups, the ITWG, and other industry forums and collaborations across the State. The Company intends to continue engaging stakeholders as it progresses with DSIP implementation.

Con Edison's actions also include the advancement of technical feasibility for deploying energy storage. The Company works with municipalities to mitigate permitting concerns regarding ESS and actively participates in and co-sponsors stakeholder forums.

In addition to incorporating stakeholder feedback into many aspects of this DSIP filing, the Company will continue to leverage this input into ongoing engagement efforts with relevant parties to advance opportunities for energy storage. To increase developer understanding of opportunities for energy storage on Con Edison's system, the Company collaborates with the New York Battery and Energy Storage Consortium ("NY-BEST"), which invites Con Edison to present on storage topics at the annual Energy Storage Day, last held in December 2022. The Company also worked with various city agencies to support the Ozone Park hazmat drill.

Additionally, Con Edison continues to work with the Joint Utilities in ITWG efforts to propose and draft new SIR technical requirements for energy storage to help create a consistent and effective process for the interconnection of energy storage devices. Updates to the SIR are covered in greater detail in Section 2.11.

Additional Detail

This section responds to the questions specific to energy storage integration.

1) **Provide the locations, types, capacities (power and energy), configurations (i.e., standalone or co-located with load and/or generation), and functions of existing energy storage resources in the distribution system.**

As of March 31, 2023, customers have installed and interconnected 493 ESS for a total capacity of approximately 25 MW of capacity. Additionally, the Company has interconnected approximately 2 MW of utility-owned storage. Appendix B provides information on storage resources currently interconnected.[64] The Company believes load relief is the primary function of most of these resources but does not track this information.

2) **Describe the utility's current efforts to plan, implement, and operate beneficial energy storage applications. Information provided should include:**

   a. **a detailed description of each project, existing and planned, with an explanation of how the project fits**

[64] The table does not include installations that are not yet operational.

into the utility's long-range energy storage plans;

Con Edison has several projects underway to plan, implement, and operate energy storage applications. The Company has designed its portfolio of projects to test different use cases and business models and assess how it can best leverage storage to meet distribution and bulk system and customer needs. These projects will help inform the Company's long-term energy storage plan by providing real-world experience with energy storage technologies and data on the costs and benefits and advance market development. For additional information on these projects, see "2b)" below.

b. the original project schedule;

Table 4 summarizes the original project schedule and current project status of the storage projects described above, including expected commercial operation date ("COD").

Table 4: Original Schedules and Current Status of Storage Projects as of May 1, 2023

Project	Original Project Schedule	Current Project Status	Next Steps
Cedar Street Substation	RFP issue date: May 15, 2023	Qualified vendor proposals due July 7, 2023	Estimated date in service: December 2025
Fresh Kills Substation	RFP issue date: May 15, 2023	Qualified vendor proposals due July 7, 2023	Estimated date in service: December 2025
Glendale Substation	RFP issue date: May 15, 2023	Qualified vendor proposals due July 7, 2023	Estimated date in service: December 2025
Fox Hills ESS	Construction began in March 2022	Equipment installation, testing, and commissioning in progress	Operate for load relief and in NYISO wholesale market
REV Demo: Commercial Battery Storage	Project start date: January 2017	Pre-summer prep for Caddell, City Island, and Woodside anticipated completion by June 2023	Estimated project end date: March 2028
Bulk Storage Procurement	Contracts executed Q3 and Q4 2023. Projects operational no later than December 31, 2028.	Bid review complete, bidders notified, and release of contract documents: March 31, 2023	Phase two bidders submit proposals: June 30, 2023

Brownsville Energy Storage Project	Estimated in-service date June 2025	Estimated in-service date June 2025	Complete system design: March 2024

c. the current project status;

See response to "2b)" above.

d. lessons learned to-date;

The Company's energy storage projects are in the early stages of planning, construction, and operation, thus making it premature to cite definitive lessons learned. A consistent early observation is that obtaining the necessary permits from municipal authorities requires significant time and effort. The permitting process will require additional stakeholder focus to support a robust market for energy storage. The Company will continue its efforts to collaborate with stakeholders to streamline the permitting process, define zoning requirements, and increase transparency in the process for its customers.

An early lesson learned from the first operational demonstration project is that warranty provisions can restrict the optimal dispatch of the asset based on economics and grid need by restricting the number of hours a battery is fully charged. For instance, batteries generally charge before 8:00 AM due to tariff requirements and therefore may be required to discharge before the optimal time to reduce late evening peak loads.

e. project adjustments and improvement opportunities identified to-date; and,

The Company expects ongoing streamlining in permitting processes and definitive market participation rules to facilitate future improvement opportunities. Additionally, the Company continues to pursue collaboration opportunities with non-governmental and city agencies as detailed above.

f. next steps with clear timelines and deliverables.

See response to "2b)" above.

3) Provide a five-year forecast of energy storage assets deployed and operated by third-parties. Where possible, include the likely locations, types, capacities, configurations, and functions of those assets.

Appendix A presents Con Edison's system-level forecast, which includes a five-year outlook for energy storage.

4) Identify, describe, and prioritize the current and future opportunities for beneficial use of energy storage located in the distribution system. Uses considered should encompass functions which benefit utility customers, the distribution system, and/or the bulk power system. Each opportunity identified should be characterized by:

a. location;
b. energy storage capacity (power and energy);
c. function(s) performed;
d. period(s) of time when the function(s) would be performed; and,
e. the nature and estimated economic value of each benefit derived from the energy storage resource.

The Company supports and will continue to pursue the State's energy storage goals through a portfolio of solutions and approaches to maximize benefits to the grid and customers. Current and future opportunities will represent a diversity of locations, sizes, functions, and business models. The Company encourages the development of storage policies, programs, and installations that provide all customers with grid benefits while maintaining flexibility to adjust course to take advantage of additional savings opportunities as the storage market matures. For example, utility-sited storage and customer-sited front-of-the-meter storage with utility control can help with load relief, reliability, and resiliency. Similarly, storage at the bulk power level can support the integration of intermittent generation and help the NYISO fulfill future needs for capacity and other bulk power services. Separately, customer-sited storage can help customers manage their load more efficiently (i.e., peak shaving), be more resilient to power outages and interruptions, support grid needs when sent the appropriate signals, such as when an NWS or demand response ("DR") program activates an event, and participate in the wholesale market.

The Company is exploring adding ESS where and how they can best benefit the system and customers, including coordinating with the NYISO to leverage storage as a bulk system asset. Specifically, the distribution system and bulk system storage deployments will produce significantly higher overall benefits for all utility customers and should be prioritized. Both use cases allow for the development of larger and more economic storage installations that support the needs of the electricity grid (e.g., support reliability in a targeted manner). Customer-sited applications, which tend to be more expensive than distribution and bulk system installations, can be operated to provide distribution and bulk system benefits when located in constrained networks. Conversely, customer-sited applications in unconstrained networks provide little or no benefits to other customers.

As the Company continues efforts to implement the Storage Order and CLCPA requirements and gains more experience with energy storage applications, the Company will be able to better identify and prioritize future opportunities and pathways for meeting the State's goal. Several projects are underway to test different operational and business models, and the Company is deploying energy storage at scale on utility property to serve the distribution grid, such as at substations with capacity constraints, and more readily provide services to the bulk power system.

The Company envisions energy storage enabling the integration of an increasing amount of intermittent renewable resources, supporting distribution system needs, providing resilience, and reducing GHG emissions. This will help customers and communities manage their usage to align with system capabilities, participate in DR programs, support new applications like EV charging, and respond to more cost-reflective rate designs, including hourly pricing and demand-based rate structures.

5) Identify and describe all significant resources and functions that the utility and stakeholders use for planning, implementing, monitoring, and managing energy storage at multiple levels in the distribution system.

a. Explain how each of those resources and functions supports the utility's needs;
b. Explain how each of those resources and functions supports the stakeholders' needs.

Given the infancy of the storage market in Con Edison's service territory and the limited installations to-date, as well as permitting issues, the Company is continuing to identify what resources and functions it may need in the future for planning, monitoring, and managing energy storage. For example, the eGIS will serve as the system of record for the specific location and operating characteristics of grid-connected assets and be the software platform for enhanced data visualization and other advanced applications. The eGIS will also allow for more accurate distribution circuit models for planning and operations and more sophisticated hosting capacity capabilities, among other uses. Additionally, Con Edison expects the DERMS to provide M&C capabilities for utility-sited and controlled devices to provide benefits to the distribution and bulk power systems. Con Edison plans on using its demonstration projects to test options for monitoring

and communicating with storage assets and provide a test case for integrating storage within the DERMS environment. Additionally, NYISO pilot projects in the Company's service territory, in which Con Edison is actively engaged, will also help test the monitoring, coordination, and communication of aggregated storage resources. Separately, the Company expects DERMS to provide enhanced capabilities to monitor and manage the distribution system, including energy storage devices, while AMI will provide customers with the information needed to monitor and manage energy use and help determine the value of adopting energy storage devices.

Con Edison also leverages its mature operational DRMS, which is currently dispatching batteries as DR resources. The Company started rolling out new scalability enhancements in 2023, to support the 1,400 percent growth in customer enrollments since 2020. Additional details on the Company's DRMS can be found in **Section 2.3**.

6) Describe the means and methods for determining the real-time status, behavior, and effect of energy storage resources currently deployed in the distribution system. Information produced by those means and methods could include:

a. the amount of energy currently stored (state of charge);
b. the time, size, duration, energy source (grid and/or local generation), and purpose for each charging events;
c. the time, size, duration, consumer (grid and/or local load), and purpose of each energy storage discharges;
d. the net effect (amount and duration of supply or demand) on the distribution system of charge/discharge events (considering any co-located load and/or generation); and
e. the capacity of the distribution system to deliver or receive power at a given location and time.

See response to "5)" above.

7) Describe the means and methods for forecasting the status, behavior, and effect of energy storage resources in the distribution system at future times. Forecasts produced by the utility could include:

a. the amount of energy stored (state of charge);
b. the time, size, duration, energy source (grid and/or local generation), and purpose of charging events;
c. the time, size, duration, consumer (grid and/or local load), and purpose of energy storage discharges;
d. the net effect on the distribution system of each charge/discharge event (considering any co-located load and/or generation);
e. the capacity of the distribution system to deliver or receive power at a given location and time.

As **Appendix A** highlights, energy storage is a separate line item in the distributed generation DG forecast. Energy storage penetration and growth information are derived from the Company's interconnection queue, which provides a near-term view of proposed and under-construction projects. For the 2022 forecasts, the Company reviewed existing and queued energy storage projects and utilized its BESS forecasting tool. The Company is working on a new forecasting tool modules that will better predict EV, PV, and DG/CHP outlooks. These new forecasting modules will be introduced in late 2023.

Energy storage systems are flexible resources with varying system impacts. For example, a 10 MW, 4-hour (or 40 MWh) battery can discharge in several ways – 10 MW discharged for 4 hours, 5 MW discharged for 8 hours, or different levels of discharge for varying durations. Battery systems can target a use case that provides a more consistent output of intermittent renewable sources or flatten the peaks of load curves of customers with highly variable loads. These systems are most predictable when they discharge in a manner set by program rules. For planning purposes, the

Company will view the demand reduction from the battery as the amount of discharge it can provide over four hours, in line with the network peak load. Thus, a 500-kW reduction from the peak would be a 2 MWh battery discharged over 4 hours. The Company understands that a battery system could discharge in a variety of ways and if an incentive mechanism (e.g., DR, NYISO price signals, or VDER) caused the battery discharge pattern to vary from this standard, then the Company could adjust the amount of reduction the forecast includes.

When the storage is charging, it adds demand to the system. Storage use, and its impact on peak load, varies by intended purpose (e.g., customer-peak shaving, DR, direct utility control) and size of the resource. Customer-peak shaving depends on the time of the customer's peak and may not be coincident with the utility or NYISO peak. Additionally, resources targeting customer-specific energy needs may have obligations that cause them to be unavailable at certain times. The Company recognizes that several factors require further study, including storage use and charging methods.

Detailing storage operational requirements within contracts allows the Company to measure and influence or control a range of storage use cases. For example, the demonstration projects support a higher level of utility visibility and impact on peak demand. NWS also provides an opportunity for the Company to activate an energy storage unit to discharge, providing localized relief as part of a larger suite of demand management ("DM") projects. Similar RFPs would guarantee coincidence with the Company's greatest need. The Company expects data from these programs to contribute to peak load and energy use impact studies in the coming years.

8) Describe the resources and functions needed to support billing and compensation of energy storage owners/operators.

Tariff-driven compensation, such as the VDER and WVS, supports customer billing through monetary crediting in lieu of volumetric crediting.

As of 2021, the Company implemented a new DRMS module that automatically calculates incentive payments and sends settlement statements to the aggregator for review, including energy storage that is enrolled in DR, and is measured then verified using the DRMS module. The Company applied the new module for the first time during the 2022 season.

Incentive structures for storage projects, such as the Bulk Storage Incentive Program and BQDM Prescriptive Energy Storage Program, and incentives when paired with CDG, are awarded as direct payment through the RFP process.

9) Identify the types of customer and system data that are necessary for planning, implementing, and managing energy storage and describe how the utility provides those data to developers and other stakeholders; and

The business model for the storage resource will influence which types of customer and system data the storage operator needs for planning, implementing, and managing targeted use cases. For example, Con Edison uses information from the distribution planning process to identify locations experiencing or expecting to experience constraints that storage (or other technologies) may be able to mitigate and shares this information with third parties through NWS postings and solicitations and identification of LSRV areas.

For developers marketing BTM storage to customers, the customer's energy demand and consumption data are typically necessary. This data is available through Con Edison via GBC and Electronic Data Interchange ("EDI"). Developers can also work with customers to obtain data directly – i.e., customers can use the Green Button Download (“GBD”) My Data tool available in My Account and share the resulting file (available in both XML and CSV formats) with the developer.

As part of Stage 3.5 of the Hosting Capacity Roadmap, Con Edison and the Joint Utilities published Stage 1 of the Storage Hosting Capacity Maps[65] in the spring of 2022. Stage 1 displays feeder-level hosting capacity (min/max), additional system data, downloadable feeder-level summary data, sub-transmission lines available for interconnection, and reflects existing DER in circuit load curves and allocations. The Company also implemented Stage 2 of the Storage Hosting Capacity Maps in April 2023, providing a suite of additional functionality, including sub-feeder level data points and nodal constraints. Hosting capacity updates and functionality are covered in greater detail in Section 2.9.

10) By citing specific objectives, means, and methods, describe in detail how the utility's accomplishments and plans are aligned with the objectives established in the CLCPA.

The Company has focused efforts to address economic and technical barriers to energy storage, including cost, market participation, permitting and zoning, access to system data, and subsidies/incentives. These have been advanced through new business models, coordination with the NYISO, work with applicable Authorities Having Jurisdiction ("AHJs"), GBC and hosting capacity maps, and NWS and VDER programs, respectively.

By integrating NWS into the planning process, the Company is routinely looking for opportunities to defer traditional investment through DER. One example is the storage-specific RFP issued in July 2022 seeking cost-effective, ESS technologies for operational availability starting as early as May 2025 within the BQDM territory.

Additionally, as described above, Con Edison has actively sought and introduced new opportunities for energy storage to participate in the Company's tariffs and programs. For example, Con Edison's revised tariffs allow for storage resources to participate in the wholesale energy markets and as a distribution resource.

Con Edison has continued to work with stakeholders to advance the technical feasibility of deploying energy storage. The Company has worked with municipalities to mitigate permitting concerns regarding energy storage devices in and around buildings and continues to actively participate in stakeholder forums, particularly those with NY-BEST. The Company is also complying with new requirements in the SIR designed to facilitate the interconnection of storage assets.

Finally, the Company is actively implementing the Storage Order and planning for the CLCPA, including a 200 MW solicitation for scheduling and dispatch rights for distribution and transmission-connected ESS that will be operational by December 31, 2028.

[65] Note 39, *supra*.

2.5. EV INTEGRATION

Context and Background

Electric vehicles are integral to achieving the State's clean energy goals and Con Edison supports EV adoption through a diverse array of programs that meet the different market segments. Policy actions span a wide range of EV integration topics – with offerings for both electric light-duty passenger vehicles and MHDVs, incentives, rate-design, utility- and customer-side infrastructure, and partnerships encouraging support for DACs. When EVs were first added to the DSIP as a standalone section in 2018, Con Edison had approximately 8,000 EVs in its service territory, and the content of this section focused on EV readiness and demonstration projects. In the ensuing years, Con Edison has launched several full-scale programs including infrastructure programs, operating cost relief programs, and fleet initiatives.

Electric vehicles continue to improve in variety, cost, and range. In 2022, national EV sales grew by 65 percent while new vehicles overall, including those powered by fossil fuels, fell by 8 percent.[66] In 2022, light-duty EV registrations within the Con Edison service territory grew by 57 percent (from 2021 levels) to almost 42,000 vehicles.

State and federal policy has played a key role in spurring EV adoption. The State's EV industry is progressing toward the goals of the Multi-State ZEV Action Plan, which calls for as many as 3.3 million light-duty ZEVs on the road by 2025, with a State goal of 850,000 light-duty EVs by 2025. To date, the State has over 139,000[67] EVs on the road, with Con Edison's service territory accounting for approximately 32 percent of this achievement. The adoption of the Advanced Clean Truck[68] rulemaking in December 2021 and the Advanced Clean Cars II[69] rulemaking in December 2022 set even higher standards. These multi-faceted investments include vehicle and charging infrastructure incentives, tax credits, state fleet investments, and funding for improved mass transit and other mobility options.[70] Tax credits will also improve the business case for customers adopting ZEVs. New York continues to offer *Drive Clean* rebates of $2,000 per vehicle on over 60 different car models.

Federal policy will drive EV adoption broadly across the country. The IIJA, passed in November 2021, authorizes $1.2 trillion to address national infrastructure needs. As part of the IIJA, the National Electric Vehicle Infrastructure ("NEVI") Program provides funding to states to strategically deploy EV charging stations at non-proprietary, publicly accessible stations located along designated alternative fuel corridors.[71] New York will receive approximately $175 million over five years through NEVI. Further, federal tax credits outlined in the IRA for qualifying vehicles include up to $7,500 per

[66] Kelly Blue Book, *New Car Sales Fell in 2022, but New Electric Car Sales Rose Dramatically*, (January 17, 2023): https://www.kbb.com/car-news/new-car-sales-fell-in-2022-but-new-electric-car-sales-rose-dramatically/#:~:text=Total%20new%20vehicle%20sales%20fell,800%2C000%20for%20the%20first%20time.

[67] Atlas Public Policy, Evaluate NY landing page: https://atlaspolicy.com/evaluateny/.

[68] Advanced Clean Trucks requires manufacturers of vehicles greater than 8,500 pounds to sell an increasing number of ZEVs in New York, targeting 100 percent of medium- and heavy-duty trucks to be zero-emission by 2045. New York State – Governor's Office, *Governor Hochul Announces Adoption of Regulation to Transition to Zero-Emission Trucks* (December 30, 2021): https://www.governor.ny.gov/news/governor-hochul-announces-adoption-regulation-transition-zero-emission-trucks.

[69] Advanced Clean Cars II increases the percentage of ZEVs as a share of total vehicles from 35 percent in 2026 up to 100 percent by 2035. New York State Department of Environmental Conservation (DEC), *DEC Announces Adoption of Advanced Clean Cars II Rule for New Passenger Cars and Light-Duty Truck Sales* (December 29, 2022): https://www.dec.ny.gov/press/126879.html.

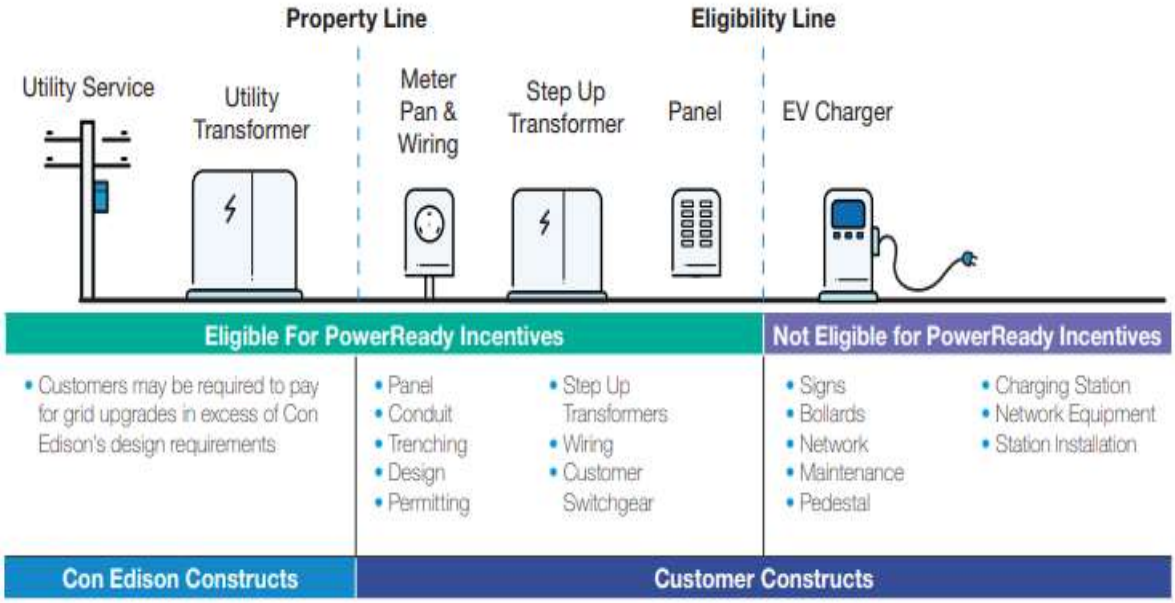
[70] For a comprehensive list of investment recommendations, see Chapter 11 of the New York State Climate Action Council, (2022), "New York State Climate Action Council Scoping Plan": https://climate.ny.gov/resources/scoping-plan/.

[71] New York's NEVI Plan is available at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/ChargeNY/National-Electric-Vehicle-Infrastructure-Formula-Program-Deployment-Plan.pdf.

passenger vehicle,[72] and commercial tax credits for LDVs and MHDVs (30 percent up to $7,500) and heavy-duty vehicles (up to $40,000).[73]

In April 2018, the Commission initiated a proceeding regarding EV Supply Equipment ("EVSE") and Infrastructure.[74] Through this proceeding, the Commission has issued a series of orders to scale the deployment of EV infrastructure. In July 2020, the Commission issued an order authorizing an EV MRP.[75] The goal of the EV MRP is to support the adoption of EVs through the development of EV charging for LDVs within New York State by reducing the upfront costs of building charging stations for EVs. Through this program, entities seeking to install L2 and/or DCFC chargers can earn incentives that will offset a large portion, or in some cases all, of the make-ready infrastructure costs associated with preparing a site for EV charger installation. In total, the order authorized a program budget of $701 million, $601 million of which was allocated to New York Joint Utilities' programs. The infrastructure eligible for incentives includes equipment and labor behind the customer's property line, up to their EV charger, as shown in Figure 12 below:

Figure 12: Make-Ready Program Eligibility



The EV Make-Ready Program incentive levels cover between 50 to up to 100 percent of applicable costs, where higher incentive levels are available to projects that are in a DAC, publicly accessible, and non-proprietary.

Starting in fall 2022, Con Edison and the Joint Utilities participated in the Commission's formal Midpoint Review of the MRP. The Commission directed that the Midpoint Review should address all aspects of the program, including budget

[72] IRS, Credits for New Clean Vehicles Purchased in 2023 or After: https://www.irs.gov/credits-deductions/credits-for-new-clean-vehicles-purchased-in-2023-or-after.
[73] IRS, Commercial Clean Vehicle Credit: https://www.irs.gov/credits-deductions/commercial-clean-vehicle-credit.
[74] Case 18-E-0138, *Proceeding on Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure* ("EV Proceeding"), Order Instituting Proceeding (issued April 24, 2018).
[75] Note 35, *supra*.

and incentive levels, eligibility criteria, and technical standards.[76] During early 2023, the Midpoint Review continued with robust stakeholder feedback on a Staff Whitepaper and a series of technical conferences, where the whitepaper recommends a significant expansion of the program with higher statewide targets for EV charging plugs and an increase in the budget to just over $1 billion.[77] Con Edison and the JU provided feedback and recommendations, including aligning program budget baselines to actual program costs and allowing incentives to cover load management technologies and other equipment.[78]

Electric vehicle operating cost incentives encouraging off-peak charging will also play a critical role as adoption of EVs increases throughout the State. These programs pay customers incentives to charge during off-peak periods which can help mitigate the impact of EV charging on the grid by providing financial support to EV drivers or station operators.

Starting in 2017, Con Edison began offering the SCNY Program, which incentivized customers to avoid EV charging during system peak hours and instead charge during overnight off-peak hours. In September 2018, the Commission approved Con Edison's proposal to expand the eligibility criteria to include MHVs.[79] Further, as part of the July 2020 Make-Ready Order described above, the Commission directed each utility to file proposals for active or managed charging programs for mass market customers.[80] The order recognized existing programs as a means for compliance with this directive. The Commission's July 2022 Managed Charging Order continued the SCNY Program through 2025, with some modifications.[81]

EV rates can also offer operating cost support for EV drivers. Public Service Law §66-o required all utilities to make a filing by April 1, 2018, establishing a residential tariff for charging EVs. In November 2018, the Commission issued its EV TOU Rates Order,[82] directing each utility to have a whole-home TOU rate option and a TOU rate based on dedicated EV loads available to residential customers. Additionally, in 2019, the Commission authorized the DCFC Per-Plug Incentive ("PPI") Program with the intent of providing operating cost relief to those with publicly accessible DCFCs. Customers were able to receive annual incentive payments for chargers that met the program's requirements. However, the program is being replaced by a new program authorized by a January 2023 Commission order,[83] discussed further below.

Operating cost relief for EV charging stations was further addressed under PSL §66-s, signed by Governor Hochul December 31, 2021, which directed the Commission to commence a proceeding to establish a commercial tariff using alternatives to traditional demand-based rate structures, other operating cost relief mechanisms, or a combination thereof to facilitate faster charging for electric vehicles.[84] The Commission opened a Commercial EV Charging proceeding, soliciting stakeholder feedback. In September 2022, informed by solicitation comments and NYSERDA's

[76] EV Proceeding, Notice of Meeting and Commencement of the Make-Ready Program Midpoint Review (issued August 30, 2022).
[77] *Ibid*.
[78] EV Proceeding, EV Make-Ready Program Midpoint Review Technical Conference JU Presentation (filed November 18, 2022), p. 13.
[79] Con Edison 2016 Electric Rate Case, Order Expanding Electric Vehicle Charging Program Eligibility (issued September 12, 2018).
[80] Note 35, *supra*, p. 124.
[81] EV Proceeding, Order Approving Managed Charging Programs with Modifications (issued July 14, 2022).
[82] Case 18-E-0206, *Tariff Filings to Effectuate the Provisions of Public Service Law Section 66-o* ("Residential Electric Vehicle Charging Tariff"), Order Rejecting Tariff Filings and Directing Tariff Revisions (EV TOU Rates Order) (issued November 15, 2018).
[83] Commercial EV Charging, Order Establishing Framework for Alternatives to Traditional Demand-Based Rate Structures (issued January 19, 2023).
[84] The New York State Senate, *Section 66-S: Electric Vehicle Charging; Commercial Tariff*, (Entry published December 30, 2022): https://www.nysenate.gov/legislation/laws/PBS/66-S.

report, DPS Staff issued a whitepaper proposing solutions.[85] On January 19, 2023, the Commission issued an order, differentiated by upstate and downstate utilities, requiring utilities to implement both immediate- and near-term solutions.[86] For the Immediate-Term Solution, the Commission directed the downstate utilities to offer operating cost solutions through a CMCP available for all charging stations and a Demand Rebate for public DCFC sites. On March 20, 2023, Con Edison filed a proposal and implementation plan to launch the immediate solutions in fall 2023, with the CMCP available to all commercial charging stations such as public, fleet, and multi-unit dwellings paying incentives for charging outside of local network peak periods. The near-term solution includes continuing the CMCP, terminating the Demand Charge Rebate, and offering an EV phase-in rate which includes an energy only time-of-use component and phases in increasing amounts of demand charges as the customer load factor increases.

On April 20, 2023, the Commission opened a new proceeding to address barriers to medium- and heavy-duty EV charging infrastructure as well as the development of proactive planning approaches to address growing electric vehicle load.[87] The initiating order recognizes the importance of electric MHDVs in decarbonizing the transportation sector and the disproportionate share of the burden DACs bear from truck and bus pollution. Electrifying the transportation sector, particularly for large commercial MHDV fleets operating out of centralized depots, can result in multi-MW hyper-clustered loads that are expected to strain localized grid infrastructure, and potentially upstream infrastructure at the substation and transmission level, and result in lengthy upgrades that present barriers to timely transportation electrification. The Company looks forward to working with stakeholders, DPS Staff, and the Commission to develop proactive planning approaches to prepare the grid infrastructure to enable the growing EV charging needs across New York City and the surrounding areas.

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Implemented a multi-faceted approach to address increased EV adoption including charging infrastructure deployment, off-peak charging incentives, and fleet initiatives.
- Partnered with NYC Department of Transportation ("DOT") and FLO EV Charging Stations, deploying over 100 curbside EV charging plugs across NYC.
- Re-launched SCNY in January 2023, with 5,700 vehicles enrolled as of May 1, 2023.
- Repurposed funds from DCFC Per Plug Incentive ("PPI") to offer Demand Charge Rebates and longer-term tariff-based compensation for EV charging demand charge management.
- Expanded the PowerReady Program to install make-ready infrastructure for thousands of EVSE plugs.
- Completed the School Bus Vehicle-to-Grid ("V2G") demonstration project Q1-2022.
- Continued to electrify Con Edison's fleet, with over 250 LDVs and 23 MHDVs as of March 1, 2023.
- Completed over 50 fleet assessments in 2022.

[85] Case 22-E-0236, *Proceeding to Establish Alternatives to Traditional Demand-Based Rate Structures for Commercial Electric Vehicle Charging* ("Commercial EV Charging"), Department of Public Service Whitepaper Regarding Alternatives to the Traditional Demand Charge for Commercial Customer Electric Vehicle Charging" (issued September 1, 2022), pp. 32-42.
[86] Note 83, supra.
[87] Note 11, *supra*.

Con Edison continues to support increased EV adoption and charging infrastructure with a host of projects and programs in various stages of implementation to enable EV adoption. Con Edison views the trajectory of current progress in four key areas: 1) Charging infrastructure; 2) Operating cost relief; 3) Fleet initiatives; and 4) Resources and information. The Company is continuing to test a range of EV enablement activities and assess where it can make the largest impact on market growth and create the most benefits.

Facilitating Charging Infrastructure

Con Edison continues to facilitate charging infrastructure deployment and leverage partnerships with public agencies and the private sector. The Company's progress in this area is shown through the PowerReady Program (approved under the Make-Ready Order) and its curbside charging project with the NYC Department of Transportation ("DOT").

PowerReady Program

Through the PowerReady incentive program authorized by the 2020 Order, the Company will support the installation of around 19,000 charging plugs by 2025, 400,000 plugs by 2035, and 1 million by 2050 with $234 million of customer incentives and $18 million additional for future proofing on utility and customer infrastructure. Con Edison has seen a robust market response to the PowerReady incentives, installing nearly 3,000 L2 and DCFC plugs in 2021 and 2022. As of December 22, 2022, 2,526 L2 plugs and 136 DCFC plugs have been installed. Additionally, as detailed in the Midpoint Review, there are an additional 7,052 L2 plugs and 172 DCFC plugs committed in the program as of October 2022.

Medium- and Heavy-Duty Make-Ready Pilot

Con Edison is implementing a MHDV Pilot Program that provides incentives for customers looking to install DCFCs for their MHD fleet vehicles. The program has a total budget of $9 million and provides incentives to cover utility-side make-ready infrastructure costs, with up to $1.2 million per participant.

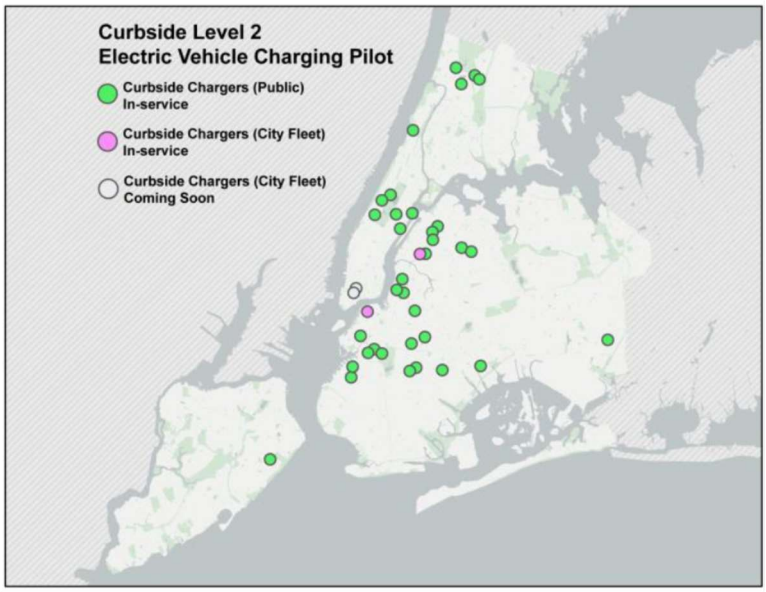
Public Charging through Curbside Charging Demonstration Project

Con Edison views public EV charging as a critical segment for supporting EV adoption in dense urban environments where many New Yorkers lack dedicated parking. The Company has partnered with the New York City DOT and AddEnergie to install 60 L2 dual-charger posts, for a total of 116 EV plugs throughout the city, where 100 of the charging plugs are publicly available and 16 of the plugs are dedicated to NYC fleet vehicles. Con Edison and DOT signed a demonstration agreement in September 2019 to allow for installation of curbside chargers in public rights-of-way for a three-year term of operation. AddEnergie agreed to cost and revenue sharing terms with Con Edison in their partnership agreement. DOT identified 35 publicly accessible sites and four NYC DOT fleet-accessible sites.

The project is testing rates of charger utilization, feasibility of the installation process, hardware durability, and new customer technology acceptance, and has proven out the viability and attractiveness of curbside EV charging in NYC where charger utilization has exceeded expectations.[88] The Company has begun collecting lessons learned from the demonstration project, which it reports in quarterly updates filings.[89]

[88] NYC DOT Curbside Level 2 EV Charging Pilot – Evaluation Report (May 2023): https://www.nyc.gov/html/dot/downloads/pdf/curbside-level-2-charging-pilot-evaluation-report.pdf.
[89] Demonstration project reports are filed quarterly in Case 14-M-0101.

Figure 13: Project Sites (in-service as of Q4 2022)



Operating Cost Relief

SCNY

SmartCharge New York promotes grid-beneficial charging behavior through two categories of incentives targeted at EV drivers and/or operators: (i) a primary incentive for avoiding on-peak EV charging during summer weekdays (June-September) and (ii) a secondary incentive to encourage overnight off-peak (midnight-8 am) charging. The primary incentive requires consistent behavior over the entire month in which the Company disburses incentives, *i.e.*, on a monthly or quarterly basis. The secondary incentive is earned on a rolling basis with monthly or quarterly incentive disbursements as it depends on the volumetric energy use during off peak hours.

As required by the Commission's Order, the Company has set incentive levels so that they are lower than the difference between standard and TOU or alternative off-peak rates for the supply and delivery portions of an illustrative EV charging electricity bill. Consequently, SCNY has altered its participant pool, offering the program to customers who are not on any TOU rate structures.[90] [91] The SCNY Program is structured so that participants are incentivized to avoid the 2pm to 6pm system peak window for charging their vehicle to minimize system impacts. Incentive structures are designed for LDVs, whether mass market or fleet. In the relaunch of the program in 2023, a limited amount of on-peak charging is permitted where incentive levels are adjusted downwards, proportional to the on-peak charging, so the incentive is not an all or nothing offering across the summer months. As of May 1, 2023, 13.5 percent of registered EVs in the service territory are enrolled in SCNY.

[90] A minority of existing customers, currently around 500 out of over 7,000 enrollees, would not be able to participate in SCNY if they continue to remain on time variant rates.

[91] The Company notes here that as of January 19, 2023, and in compliance with Public Service Law (PSL) §66-s which requires consideration of the need for operating cost relief in the EV market, the Commission authorized the development of a commercial managed charging program as one method to provide such operating cost relief to chargers in compliance with state law. The Company intends to transition the heavier classes of vehicles as well as fleets that currently participate in SCNY to the new Commercial Managed Charging Program. The Company will work with Department of Public Service ("DPS" or "Staff") on the timing and mechanism for such a transition.

Rate Design

Public Service Law 66-o required all utilities to make a filing by April 1, 2018 establishing a residential tariff for charging EVs, with a requirement for a TOU component. At the time the law was passed, Con Edison had existing TOU rate options that complied with this requirement and promoted off-peak charging through differentiated rates for on-peak, off-peak, super peak, and by season. The two TOU rate options consist of (i) a residential TOU with a one-year price guarantee and reduced monthly customer charge and (ii) installation of a separate residential meter to solely charge an EV. For both TOU rate options, after 12 months, the Company will compare what was paid under TOU rates with what would have been billed under the standard residential rate. If a customer paid more on the TOU rate, the Company credits the customer's account for the difference. As of January 1, 2023, EV owners in Con Edison's service territory on the residential TOU rate will not be eligible to participate or receive incentives through the SCNY Program.

In 2022, the Company had 377 EV customers enrolled in the whole house TOU rate, with additional applications pending TOU meter installation. Special Provision F allows customers to measure EV load on a separate meter from other electric consumption for billing purposes, thus allowing for EV-specific TOU rates.[92]

Business Incentive Rate ("BIR")

Con Edison also offers businesses that receive economic incentives from the city, county, or state electric rate delivery reduction, ranging from 34 to 39 percent, under the BIR plan. For EV chargers receiving the BIR, the facility must be open to the public, such as a supermarket store or train station, and have a newly constructed EVSE with a minimum 100 kW of aggregate charging capacity and a maximum aggregate demand of 2,000 kW. Qualifying charging stations can opt into the BIR for the delivery discount through April 2025. This rate option is expected to be phased out with the introduction of Demand Charge Rebates, EV Phase-In Rates, and the CMCP in late 2023.

Load Management Technology Incentive Program ("LMTIP"), Demand Charge Rebate, and EV Phase-In Rate

The LMTIP is designed to provide incentives for eligible technologies, such as energy storage projects, including on-site energy storage, and energy storage integrated directly into charging equipment, as well as other advanced load management technologies and software. The JU recommend a broad approach to LMTIP equipment eligibility to enable a high level of program participation and to effectuate load management at more sites. Remaining PPI funds will be allocated to the LMTIP.

The Near-Term Solution continues the CMCP and replaces the Demand Charge Rebate with a tariff-based EV Phase-In Rate option that steps up the demand charge portion of the bill with increasing customer load factor. The new EV Phase-In Rate will consist of four graduations based on annual load factors. The new EV Phase-In Rate is designed to provide scalability, beginning with a TOU energy charge rate structure,[93] and progressively phasing into an increased demand charge as customer load factors increase. Con Edison is also required to develop a proposal for transitioning customers from the Demand Charge Rebate or CMCP use-case specific adders as part of the EV Phase-In Rate filling 180 days after the January 2023 orders.

[92] Case 08-E-0539, *Proceeding on Motion of the Commission as to the Rates, Changes, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Case 08-E-0539, P.S.C. No. 10 Electricity, Housekeeping Changes (tariff filed March 29, 2012).
[93] *Ibid*, p. 39.

Fleet Initiatives

Completion of School Bus V2G Demonstration Project

On November 13, 2018, Con Edison filed its implementation plan for the School Bus V2G demonstration project, which examined the technical and operational viability of using school buses as both a grid resource and transportation asset. Key tests included assessing whether electric school buses function well for transportation purposes and are reliable as grid assets and determining whether using buses as grid assets causes significant impacts to the equipment, such as battery lifetime and state of health impacts. The project was the first deployment of five new, full-sized electric school buses in the State and was also the first to use school buses to perform V2G charging, where operators discharged the buses' batteries to deliver energy to the grid. The electric buses served the school district of White Plains and were operated by National Express. Energy export continued through March 2022 when National Express assumed control of the buses. National Express continues to operate the buses for student transportation. The Company's final quarterly report[94] provides a detailed list of lessons learned.

Con Edison Transportation

Con Edison continues to opt for plug-in electric fleet solutions that meet the Company's operational criteria. The Company is transitioning its light-duty fleet to EVs wherever possible and reducing the use of fossil fuels in MHDV trucks. Con Edison is committed to electrifying 80 percent of light-duty fleet vehicles by 2030 and 100 percent by 2035. To date, 100 percent of the Company's new light-duty fleet vehicle purchases are electric. As of March 1, 2023, the Company's fleet included 280 plug-in passenger vehicles and 12 plug-in MHDVs. Con Edison has installed a total of 121 EV chargers (110 L2, 11 DCFC) to serve its plug-in electric fleet. Most sites are equipped with one DC fast charger and nine L2 chargers. The Company continues to engage employees in its fleet electrification efforts through electric pool vehicles available to employees for business use.

Fleet Assessment Service

Con Edison offers a Fleet Assessment Service for LDVs and MHDV fleet operators interested in electrification. The Company completes proactive outreach to local small and large national fleets that may be considering electrification. The Fleet Assessment Service helps fleet operators evaluate certain costs and benefits associated with fleet electrification, including support for site selection and project charging costs using the EV rate tool described below. Con Edison, along with the JU, has developed a common application form that owners and operators can find at Fleet Assessment Services.[95]

Resources and Information

Based on stakeholder feedback, Con Edison has developed a suite of tools and resources for EV customers and contractors, provided on the Company's EV website.[96] Additionally, to support external customer application and project tracking and program administration, the Company has developed an EV program platform which supports the entire project lifecycle, from initial outreach through payment, closeout, accounting, and reporting with integrations to the Company's backend energy services and financial systems. Through a single login, program participants can track their

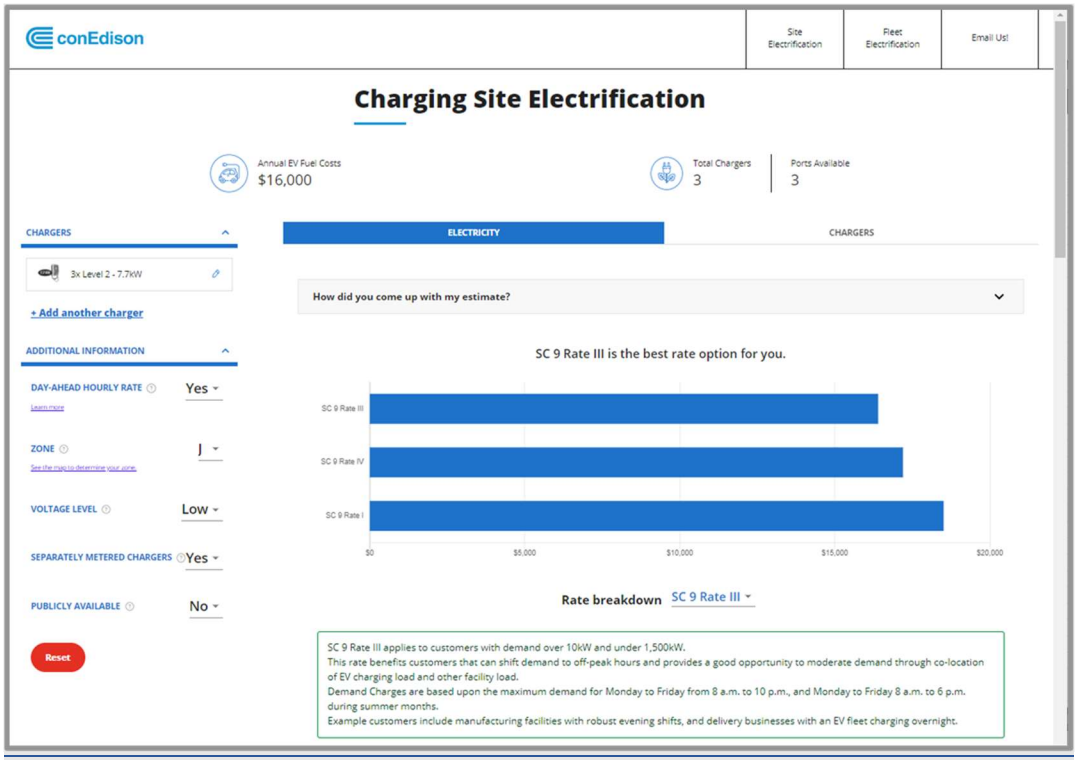
[94] Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Con Edison REV Demonstration Project: Electric School Bus V2G Q1 2022 Quarterly Progress Report (May 2, 2022).
[95] Joint Utilities Fleet Assessment Services landing page: https://jointutilitiesofny.org/ev/make-ready/fleet-assessment.
[96] Con Edison Electric Vehicle resource landing page: https://www.coned.com/en/our-energy-future/electric-vehicles.

project's status in the program and energy services process, upload all required documents and data, and submit inquiries.

EV Rate Tools

In 2022, Con Edison launched its EV charging cost calculator to help customers estimate fuel cost savings, choose the most cost-effective rate for their charging station, and see available operating cost incentives.[97] This tool provides two entry pathways focused on fleet customers and commercial charging station operators, such as public station and at multi-unit dwellings. The tool accounts for the factors that influence the cost of charging, such as the typical load profile of the facility or facility, how often the chargers are used, and the characteristics of the charger installed.

Figure 14: EV Charging Cost Calculator Output



[97] Con Edison Charging Cost Calculator: https://charging.coned.com/.

Future Implementation and Planning

Summary of Future Actions

- Expand the PowerReady Program to continue to provide make-ready infrastructure to support state EV goals and the development of an equitable EV charging network.
- Launch the CMCP to provide incentives for commercial EV charging stations to mitigate EV charging impact on the grid.
- Develop and launch the EV Phase-In Rate, to be detailed in the Company's upcoming Near-Term Solution filing.
- Work to address barriers to MHDV electrification and plan proactively for rapid growth in EV charging.
- Continue stakeholder collaboration with various EV owner's clubs, non-governmental organizations, dealerships, developers, building management companies, and other businesses to help educate their members, employees, and customers about SCNY.

Con Edison is committed to the State's EV goals and implementing programs and projects that facilitate development of charging infrastructure to support increased EV adoption. The Company will continue to apply experience and lessons learned from its portfolio of EV demonstration projects and programs to develop future customer offerings and drive towards the State's ambitious EV charging goals.

As part of the Joint Utilities' EV Working Group, Con Edison will continue collaborating on lessons learned and best practices related to critical EV issues. The EV Working Group will also continue working with other related working groups, including the Information Sharing Working Group and the Integrated Planning Working Group.

Risks and Mitigation

The EV technology market is continually improving, with EVs increasing in range and declining in cost, and commercial fast charging speeds increasing as well. At the same time, the EV and charging market's development is supported by federal and state regulatory support, as described above. Even with this progress, there are two potential key risks: (i) EV market development is too slow and unable to keep pace with ambitious policy goals, and (ii) EV market development is so fast that the grid buildout is not able to keep pace with the growth in EV charging.

Addressing the risk first, without the right level of support for EV purchases and EV charging buildout, the market will not accelerate at a sufficient pace to meet State goals for vehicle sales. Vehicle cost and performance may not improve at the expected pace and magnitude, which could slow purchases. Similarly, while the nascent EV charging market response to make-ready incentives has been robust, it has been tempered more recently by rising customer costs and program experience has shown that market activity is still highly sensitive to incentive levels.[98]

Additionally, as utilities across the northeast corridor deploy EV programs and incentives, EV charging station developers have been drawn to areas with the highest incentives, relative to the cost of installing EV charging, pulling focus from the PowerReady program. Finally, the MHDV electrification market has yet to take off, where Con Edison total cost of

[98] In the PowerReady program, average L2 make-ready costs are exceeding the Make-Ready Order baseline by over 35 percent, and DCFC charging customer-side make-ready costs have risen by over 60 percent between Q1-2021 and Q4-2022; this trend is expected to continue as utility upgrades become more common, driven by increasing site sizes and service-adequate sites becoming harder to find.

ownership analysis shows that all vehicle types and use cases in this sector do not yet have a positive business case for electrification. The current rate of EV charging development and vehicle adoption across all vehicle classes points to a need for more support for this transition, and the risk of slow market development can be mitigated by the establishment of compelling incentives that drive the fast pace of market development, including utility make-ready incentives.

Addressing the second risk, the transportation sector is unique in speed, scope, and scale of the clean transportation transition. With the aggressive policies already in place, and the right financial support as discussed just above, the clean transportation transition could occur rapidly. Electric vehicle adoption is expected to follow a typical s-shaped technology adoption curve with a steep ramp in EV adoption. The exact timing of the inflection point is unknown, but there is high confidence as to where the load will materialize. Electric vehicle charging loads will appear across Con Edison's territory, and MHDV loads will be clustered in many cases due to the Company's dense urban territory, zoning, and existence of industrial business zones in NYC. Given the large loads at individual stations, along with clusters of even larger loads ramping up quickly, there is a real risk that the buildout of longer lead time utility infrastructure, like substations, could delay progress in clean transportation. To mitigate this risk, moving from a just-in-time approach to a more proactive planning approach, as is being addressed in the barriers to medium- and heavy-duty EV charging infrastructure proceeding, will support the buildout of grid capacity before its needed by EV charging stations.

Finally, rapid growth often brings significant market disruption, which could result in some of the Company's project vendors or business partners going out of business or being acquired by other firms. Con Edison mitigates the risk of partnerships by using competitive solicitations and robust procurement practices, and by conducting extensive due diligence prior to entering a relationship and practicing robust project management and risk mitigation practices.

Stakeholder Interface

Con Edison consistently engages stakeholders, including regular meetings with and outreach to government agencies, environmental non-profit groups, charging station developers, fleets, including school buses, and EV and load management technology providers. In March 2022, the Company participated in the International Auto Show booth with the NYPA and NYSERDA to promote available programs and EV activities. Con Edison is also collaborating with NYSERDA on implementing the New York Clean Transportation Prize projects. The Company is actively engaged with the New York City's Metropolitan Transportation Authority ("MTA"), as they electrify their large fleet of buses, and supports EV charging station buildout for the New York City fleet and NYC DOT EVs through the PowerReady program.

To provide stakeholders with information, the Company's E-Mobility team holds "office hours" the fourth Friday of every month from 9-10 AM, where anyone can drop in to ask questions or get directed to useful resources. Recurring invites to these meetings are available upon request through EVMRP@coned.com. Additionally, the Company developed a dashboard for the PowerReady program, providing the following information monthly: (i) program budget available, (ii) number of plugs installed, committed, and available for application, (iii) current incentive levels, (iv) status of any program waitlists, and (v) a log of all program changes since launch[99].

The Company also works closely with the Joint Utilities to align efforts and share lessons learned through weekly coordination meetings across various programs and efforts. The JU maintain a webpage dedicated to the EV programs.[100] Along with the JU, the Company has participated in numerous technical and stakeholder conferences hosted by DPS Staff and has hosted stakeholder information-sharing events. The JU will continue to engage stakeholders

[99] PowerReady Incentive Dashboard landing page: https://www.coned.com/en/our-energy-future/electric-vehicles/power-ready-program/contractor-resources/powerready-incentive-dashboard.
[100] Joint Utilities Electric Vehicles Programs landing page: https://jointutilitiesofny.org/electric-vehicles.

as part of the EV proceeding in upcoming technical conferences and as EV programs are developed, such as the statewide Make-Ready Program or managed charging programs.

Additional Detail

This section responds to the questions specific to EV integration.

1) **Using a common framework (organization, format, semantics, definitions, etc.) developed jointly with the other utilities, identify and characterize the existing and anticipated EV charging scenarios in the utility's service territory. Each scenario identified should be characterized by:**

   a. **the type of location (home, apartment complex, store, workplace, public parking site, rest stop, etc.);**

The most detailed analysis of charging scenarios comes from the National Renewable Energy Laboratory's ("NREL") 2017 *National Plug-in Electric Vehicle Infrastructure Analysis*, which includes an estimated number of public L2 and DCFC or quick charging ports in several geographies.[101] Subsequent NREL analysis segments national trends by charging level, charging network, public vs. private, charging location, and fleet vs. non-fleet.[102] Table 5 highlights Con Edison's categorization of charging infrastructure (or EVSE) into types of market segments, locations, and examples.

Table 5: Categorization of EVSE

	Residential	Commercial
Private Property-Sited Vehicle Charging	• Single-family home • Multi-unit dwelling	• Workplace • Maintenance yards and depots (light-duty fleet) • Transit bus depot • School bus depot • Private parking lots (e.g., requiring visitor validation)

[101] National Renewable Energy Laboratory, *National Plug-in Electric Vehicle Infrastructure Analysis*: https://www.nrel.gov/docs/fy17osti/69031.pdf.

[102] Brown, Abby, Stephen Lommele, Alexis Schayowitz, and Emily Klotz, (2021), Electric Vehicle Charging Infrastructure Trends from the Alternative Fueling Station Locator: Fourth Quarter 2020. Golden, CO: National Renewable Energy Laboratory, NREL/TP5400-0120: https://www.nrel.gov/docs/fy21osti/80120.pdf.

Publicly Accessible Vehicle Charging	• N/A	*Co-located with commercial host* • Stores • Shopping centers/malls • Parking garages • Rest areas *Dedicated charging location* • Municipal curbside and parking lot • Quick charge hubs

b. the number and spatial distribution of existing instances of the scenario;

The U.S. Department of Energy Alternative Fuels Data Center has an interactive online station locator.[103] The locator includes a searchable database and capability to download data about existing and announced or planned charging stations. It is searchable by state and zip code and returns the number of chargers available and/or planned in a given geography. Data fields include location, charger type, charging network, and other useful information. The Plugshare website[104] also identifies public L2 and DC quick chargers.

c. the forecast number and spatial distribution of anticipated instances of the scenario over the next five years;

The Company forecasts EV-related system and network coincident peak demand and integrates those results into the peak demand forecast to meet the future EV load. The EV load forecasting model is unique to New York City and Westchester and considers the charging impact of electric LDVs and electric MHDVs as well as anticipated EV charging station projects in the Company's queue.

At a high level, the methodology considers the projected number of electric LDVs that will be registered in the Company's service territory, allocates these vehicles to networks, and estimates the expected peak charge rate and hour. In addition, the approach also considers the current number of internal combustion engine MHDVs in each network, projects the rate at which these vehicles will be electrified, and estimates the expected peak charge rate and hour. The forecast accounts for the impact of identified upcoming EV charging station installations by comparing the anticipated peak demand of stations in each network with the estimated total vehicle demand. Table 6 summarizes the basic assumptions for EV chargers:

Table 6: EV Charger Assumptions

Charging Type	Assumptions
Level 1	120-V AC, 12-16 amp, 1.4-1.9 kW

[103] U.S. Department of Energy | Energy Efficiency & Renewable Energy, *Alternate Fuels Data*: https://www.afdc.energy.gov/stations/#/find/nearest.
[104] Plugshare landing page: https://www.plugshare.com/.

Level 2	208/240V AC, 30-80 amp, 7.2 - 19.2 kW
Quick Charging	DC power inverter, 208-600V AC, 25-150 kW

Additionally, EVSE developers and hosts will determine the nature of public charging in the Company's service area. EVSE developers will likely look at driver travel patterns, vehicle charging profiles, vehicle registration distribution, and other key data that it requires to understand the nature of charging infrastructure needs.[105]

d. the type(s) of vehicles charged at a typical location (commuter car, bus, delivery truck, taxi, ride-share, etc.);

The Company expects in the near-term that LDVs will be the predominant class of EVs in the service area. This will include a mix of privately-owned, commercial and municipal fleets, for-hire transportation network vehicles, and taxi cabs. The Company assumes that these LDVs will charge at private and public charging locations, which it will continue to support through the MRP.

With the passage of Advanced Clean Trucks, and additional future policy developments, Con Edison expects to see greater adoption of MHDVs, which has been limited to date. These vehicles typically would be part of commercial fleets and will likely use private charging. Con Edison's collaborations on these use cases are described above in the Stakeholder Engagement section.

e. the number of vehicles charged at a typical location, by vehicle type;

While the Company can forecast the range of vehicles needed to comply with ZEV, it is difficult to answer how many chargers will be installed at specific individual locations to support those vehicles. As a source of general information, the NREL's *National Plug-in Electric Vehicle Infrastructure Analysis*[106] counts the current number of chargers and vehicles to estimate how many chargers are typical of public charging locations and how many vehicles those chargers support, and forecasts the infrastructure needed to support further EV adoption.

f. the charging pattern by vehicle type (frequency, times of day, days of week, energy per charge, duration per charge, demand per charge);

Generally, Con Edison does not collect or forecast charging patterns by vehicle type. The Company's EV-related system and network coincident peak demand forecast assumes an average charging usage per vehicle based on previous studies and a vehicle charging rate equal to the weighted average of current registered EVs. Con Edison collects charging pattern data through the SCNY Program, which offers incentives to eligible EV drivers for installing and activating a free connected, plug-in car device and charging in Con Edison's service territory at off-peak times.

[105] There are a few public studies on current and forecast public EVSE needs. *See, e.g.*, National Renewable Energy Laboratory, *National Plug-in Electric Vehicle Infrastructure Analysis*: https://www.nrel.gov/docs/fy17osti/69031.pdf.
[106] *Ibid*.

Additionally, though adoption has been relatively limited, station data for the DCFC charging stations that receive the DCFC PPI from Con Edison is collected, anonymized, aggregated, and reported publicly.

g. the number(s) of charging ports at a typical location, by type;

The Company does not forecast the number of chargers at a typical location in its planning scenarios. For reference, the National Renewable Energy Laboratory's *National Plug-in Electric Vehicle Infrastructure Analysis* identifies assumptions on the number of charging ports at a typical location.[107]

h. the energy storage capacity (if any) supporting EV charging at a typical location;

The instances of energy storage applications installed in Con Edison's service territory specifically to support EV charging are very limited.

i. an hourly profile of a typical location's aggregated charging load over a one-year period;

The Company does not currently forecast the hourly profile of a location's aggregated charging load over a one-year period.

j. the type and size of the existing utility service at a typical location; and

The type and size of the existing utility service vary based on the location.

k. the type and size of utility service needed to support the EV charging use case.

Existing service for residential and commercial customers may potentially support Level 1 EVSE and a small number of L2 chargers in some cases. Quick charging and/or deployments of several L2 EVSE may require a service upgrade and/or grid reinforcement.

2) Describe and explain the utility's priorities for supporting implementation of the EV charging use cases anticipated in its service territory.

The Company's priorities for supporting EV adoption are to expand customer options and access to EV charging across all vehicle classes, in part through developing make-ready infrastructure for EVSE, and encouraging off-peak vehicle charging. Alongside private charging by customers who have access to a charging station at home or work, publicly accessible EVSE serves as an enabler for the many vehicle owners without access to off-street parking and private EVSE. For example, quick charger hubs, analogous to conventional fueling stations, reduce the "range anxiety" challenge to EV adoption. Curbside charging also presents an opportunity for public charging in Con Edison's dense urban area.

Further insights related to EV charging will come through the curbside charging demonstration project in partnership with the NYC DOT and AddEnergie, the EVSE network provider. As discussed above, these parties have identified and equipped dedicated EV parking locations with chargers across New York City. The Company continues to expand customer access to charging through the PowerReady Program.

Additionally, the Company continues to encourage off-peak charging, which limits the impact of new EV charging loads and limits customers' exposure to higher charging costs. Con Edison offers residential TOU rates to incentivize off-peak charging, including a one-year price guarantee for EV charging loads. The SCNY Program, discussed above, provides incentives for eligible EV drivers for installing and activating a free connected, plug-in car device and charging in Con

[107] *Ibid*.

Edison's service territory at off-peak times. The Company will launch a CMCP later this year providing incentives for all commercial stations such as public, fleet, and multi-unit dwelling stations to charge outside of local network peak periods.

3) Identify and describe all significant resources and functions that the utility and stakeholders use for planning, implementing, monitoring, and managing EV charging at multiple levels in the distribution system.

a. Explain how each of those resources and functions supports the utility's needs.

Capacity maps identifying transformer loading can provide developers with some information on network locations for siting EV charging stations. Company incentives, like those for managed charging programs, encourage grid beneficial charging, as do residential and commercial TOU tariff offerings. The Company also supports battery integrated fast charging and standalone battery installations that can mitigate the impact of EV charging on the grid. The Company additionally tested V2G through its recently completed school bus demonstration project, though significant work still remains to develop operational and market solutions for this use case.

b. Explain how each of those resources and functions supports the stakeholders' needs.

See response to "3a)" above.

4) Identify the types of customer and system data that are necessary for planning, implementing, and managing EV charging infrastructure and services and describe how the utility provides this data to interested third parties.

The Company's requirements for customer data for planning EV infrastructure and services include vehicle types, consumer driving ranges and locations, and driving and charging patterns. The Company is collecting this type of data through outreach to EV charging station developers, fleets, other large customers, and through SCNY for customers enrolled in the program. The Company may share aggregated anonymized SCNY data from the program with third parties, including the public, to inform charging patterns in the service area, subject to the applicable privacy standard.

For system planning purposes, the Company collects new customer charging load information via a "load letter" submitted through the energy services process, following a process similar to any customer load request. The load letter provides key information to identify any necessary system reinforcements and/or excess distribution facilities needed to deliver the service. This customer specific data is not shared with third parties.

To help developers identify sites where it may be easier to install charging, the Company provides an EV charging capacity map. In the networked underground system, the map shows four levels of transformer capacity, ranging from less than 200 kVA to more than 1,000 kVA. This tool provides guidance but does not replace a site work analysis that considers additional physical and electrical factors.

Additionally, the Joint Utilities have identified a subset of the higher priority data that will be required for planning, implementing, and managing EV charging infrastructure and services, including:

- *Customer load profile* – The utility will need to know the customer load profile, including charging capacity pre-installation of EV charging infrastructure to help understand the impact on the customer as well as system-level impacts.
- *Likely EV charging demand* – In workplace or other non-residential types of EV charging, the utility would need to know the anticipated charging demand (e.g., how many EVs are likely to be charging, and at what level, such as Level 2 charging versus DC fast charging). This will help characterize the charging capacity required at the facility. For a residential installation, Con Edison would need to know the level of charging that the customer is

seeking, namely Level 1 or Level 2. Note that it is unlikely, at this time, that the utility plays a substantive role in deploying Level 1 charging infrastructure.

- *Distribution asset load profile* – The utility will need to know the load profile on the nearest substation or similar distribution asset to understand the likely impact that may arise from increased load attributable to EV charging. This will enable the utility to update its asset management strategy for that substation or feeder.
- *Potential location of EV charging infrastructure* – To the extent that implementation of EV charging infrastructure is inclusive of installation, the layout of the proposed installation, namely the location of the physical hardware, will help determine the associated costs. More specifically, the trenching and cutting costs associated with the installation of EVSE at existing facilities can vary significantly depending on the location of the planned installation relative to the point of connection with utility service.

5) Describe the resources and functions needed to support billing and compensation of EV and EVSE owners/operators.

EV charging stations may be separately metered, or the EV charging load may be co-mingled with other non-EV load behind a single meter. In both cases, EV charging customers are billed similarly to any other customers based on metered data. For retail EV charging stations that charges users, compensation is typically provided by credit card or through a mobile application.

6) By citing specific objectives, means, and methods describe in detail how the utility's accomplishments and plans are aligned with New York State policy, including its established goals for EV adoption.

Con Edison continues to support progress towards ambitious vehicle and EV charging policy goals through a variety of projects and programs in four key areas: 1) Supporting charging infrastructure development; 2) Encouraging grid beneficial behavior and providing operating cost support; 3) Providing support services to fleets; and 4) Sharing resources and information with market participants and stakeholders. The Company's work in these four areas is described above. The Company is continuing to expand its EV offerings and assess where it can make the largest impact on market growth and create the most benefits and progress towards policy goals.

7) Describe the utility's current efforts to plan, implement, and manage EV-related projects. Information provided should include:

a. a detailed description of each project, existing and planned, with an explanation of how the project fits into the utility's long-range EV integration plans;
b. the original project schedule;
c. the current project status;
d. lessons learned to-date;
e. project adjustments and improvement opportunities identified to-date; and
f. next steps with clear timelines and deliverables.

The Company describes its programs, demonstration, and other projects in the following tables.

Table 7: SmartCharge New York ("SCNY")

Description	Con Edison's SCNY Program encourages off-peak EV charging through enrollment payments, behavioral incentives, and access to real-time usage dashboard to monitor EV statistics. The program will help Con Edison understand charging behavior and EV driver response to incentives and was expanded to offer incentives to MHDVs, including buses. The Company re-launched the program in 2023. The EV user connects to the SCNY Platform through their vehicle's on-board telematics or through a compatible charging station. This allows users (and the Company) to know where, when, and how much energy an EV consumes during charge events. Payment incentives are then calculated based on the EV behavior, with increased earning opportunity when avoiding charging during summer (June 1 to September 30) peak hours between 2:00 p.m. and 6:00 p.m. on weekdays.
Schedule	SmartCharge New York started on April 2017 and was relaunched in a 2022 Commission order.
Status	As of May 1, 2023, approximately 5,700 EVs are enrolled in the program.
Lessons learned	The Company is working to optimize the onboarding process into SCNY and continue to provide participants with charging data in an easy to understand and practical format.
Adjustments/Improvements	The Company has transitioned away from the hardware device needed to provide the vehicle telematics data to using on-board telematics and addressed incentive structures.
Next Steps	The program will continue to add new participants and explore ways to improve the customer experience.

Table 8: PowerReady Make-Ready Program ("MRP")

Description	In authorizing Con Edison's PowerReady Program, the Commission set a target of 18,539 L2 plugs and 457 DCFC plugs. Since its launch in 2020, the Company has deployed thousands of plugs, expanding access to charging infrastructure for its customers through offering incentives to cover the cost of bringing power from the grid to the EV charger.
Schedule	The 2020 Order authorized the PowerReady Program to run from July 2020 through 2025.
Status	As of the Midpoint Review, Con Edison had the following counts of L2 and DCFC plugs installed or under construction: L2: 7,999 plugs of 18,539 (43%)

	DCFC: 227 plugs of 457 (50%)
Lessons learned	Experience from the program shows that actual make-ready costs exceed the baseline costs set in the 2020 Order for L2 plugs. There is a demand for EV charging, including in disadvantaged communities, but installation is highly sensitive to incentive levels. As incentives decreased, the number of applications also declined. The program is also seeing an increase in more expensive DCFC projects as more projects require utility-side upgrades. Some developers have also expressed interest in utilizing load management technologies, which help reduce make-ready costs and provide grid benefits.
Adjustments/Improvements	The PowerReady Program is undergoing its Midpoint Review process where program parameters are being evaluated and considered for potential modification. Issues including the following are being considered: • Incentive levels • Plug targets • Changes to equipment eligibility • Funding for disadvantaged communities • Support for MHDVs • Fleet assessment services • Program timeline and continuation
Next Steps	Con Edison will work with stakeholders and continue to participate in the Midpoint Review process.

Table 9: NYC Curbside Level 2 ("L2") Charging

Description	Con Edison partnered with the NYC DOT and AddEnergie to implement a plan to provide L2 EV charging to drivers across the city's five boroughs with the goal of increased visibility and access to EV chargers. The demonstration includes 60 dual-charger posts for a total of 120 EV plugs, where 20 chargers are exclusive to NYC fleet vehicles and the rest will be open to the public. Publicly available EV charging enables EV ownership by customers that lack off-street parking.
Schedule	The project launched in July 2021 and Con Edison will maintain the posts through at least July 2024.
Status	Con Edison and AddEnergie are concluding the Site Selection, Design, and Installation phase (Phase 2) and are currently in Network Operations and Maintenance (Phase 3) for commissioned sites.
Lessons learned	Customer research provided early lessons from the Operations phase. Survey results showed support for EVs, with project awareness steadily increasing from baseline. Half of survey respondents reported that they are likely to consider purchasing an EV within the next five years, and the majority of respondents reported that the project would make them feel positive about both their

	neighborhood and Con Edison. The Company has observed steadily increasing utilization of the curbside charging stations. The Company continues to study trends in charging behavior and factors affecting utilization, such as location, time in service, customer and community outreach, and parking enforcement to identify strategies to improve site performance.
Adjustments/Improvements	N/A
Next Steps	Complete construction, continue operations, and plan continued community and customer outreach.

Table 10: Medium- and Heavy-duty ("MHD") Make-Ready Pilot

Description	Con Edison is implementing an MHD Make-Ready Pilot Program that provides incentives for customers to install DCFCs for their MHD fleet vehicles. The program has a total budget of $9 million and provides incentives to cover utility-side make-ready infrastructures costs.
Schedule	The program began in 2020 and will run through at least 2025.
Status	Con Edison continues to review applications for the MHD Make-Ready Pilot and advises customers on their MHD fleet electrification needs.
Lessons learned	Level 2 chargers are not eligible for incentives in the program but many customers seeking to electrify their MHD fleets are looking to install L2 chargers. Furthermore, the incentives only cover utility-side make-ready costs. Most projects to date would only incur customer-side costs, making them ineligible.
Adjustments/Improvements	The Midpoint Review process is currently underway where program parameters are being evaluated and considered for potential modification. Issues being considered include eligibility criteria, including expansion to include L2 plugs and customer-side costs, and budget.
Next Steps	Con Edison will continue to review applications to the Pilot and await any changes that come out of the Midpoint Review.

8) Describe how the utility is coordinating with the efforts of the New York State Energy Research and Development Authority (NYSERDA), the New York Power Authority (NYPA), New York Department of Environmental Conservation (DEC), and DPS Staff to facilitate statewide EV market development and growth.

Con Edison has continually collaborated on EVs with State agencies, authorities, and other stakeholders. In addition to the fleet testing and development of electric products from a multitude of manufacturers, Con Edison served as the East Coast technical service center from Maine to Florida for Toyota's introduction of the electric RAV4. The Company worked to develop some of the first fast chargers ever used for over-the-road EVs in the Manhattan facility and was

involved in the development of the American National Standards Institute Standardization Roadmap for EVs. The Company has closely coordinated its commitments and efforts with NYSERDA, NYPA, DEC, and DPS Staff.

Con Edison continues to coordinate directly with stakeholders to support EV adoption, including regular meetings with government, non-profit, and industry stakeholders to share information and project updates. The Company also coordinated with the DOT for the curbside charging demonstration project.

2.6. CLEAN HEAT INTEGRATION

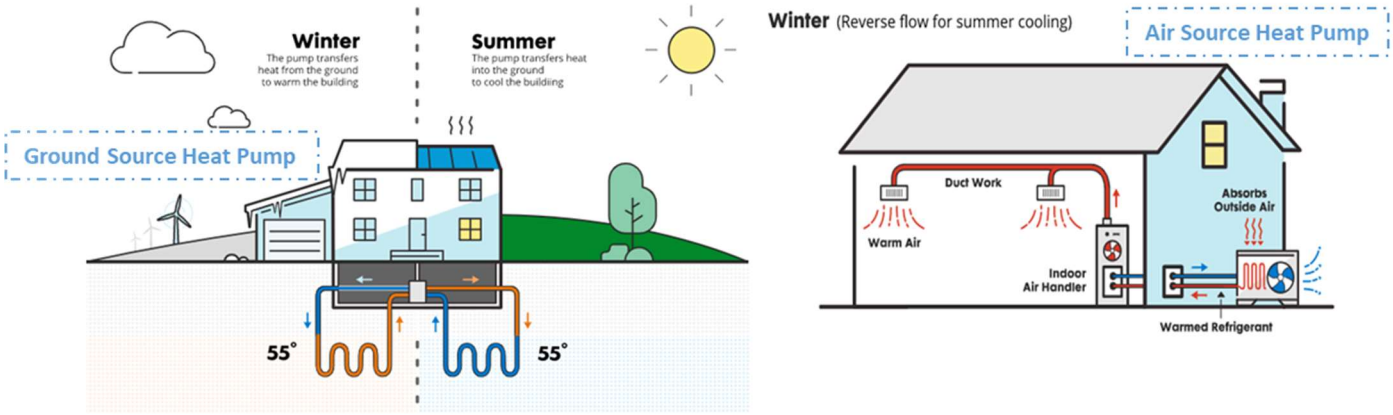
Context and Background

Increased EE and building electrification are critical components of the State's ambitious clean energy goals. The Commission's 2018 Order Adopting Accelerated Energy Efficiency Targets[108] established the goal of reducing energy usage by 185 TBtu statewide by 2025. Following the Accelerated Efficiency Order, New York adopted the CLCPA,[109] which mandates that 35 percent of overall benefits of spending on clean energy and EE programs be directed towards disadvantaged communities. More recently, the Commission's 2020 Order[110] directs an additional incremental 35.8 TBtu utility-driven EE savings, with corollary goals of achieving (i) 3 percent annual reduction in electricity sales by 2025 and 1.3 percent of natural gas sales, (ii) an aggregate reduction of 3.6 TBtu through heat pump deployment, and (iii) the continued provision and enhancement of programs for LMI customers. In conjunction with these goals, Governor Hochul established guidance to achieve a minimum of 1,000,000 electrified homes by 2030[111] which was doubled to 2,000,000 through the CLCPA Scoping Plan.[112] Assuming a load-ratio-share basis, the Company must convert 350,000 – 750,000 homes in its service territory.[113] The heat pump corollary goal of the 2020 NENY Order and Governor Hochul's focus on electrified homes demonstrates the central role that clean heat technologies will play in achieving these policy objectives.

The New York State Clean Heat Program includes a variety of initiatives to advance the adoption of efficient electric heat pump systems that are used for space and water heating. Core to the NYS Clean Heat Program is the suite of incentives that support customer adoption of eligible heat pump technologies through promotion and pricing discounts offered by contractors and other heat pump solution providers. Eligible technologies include air source heat pumps ("ASHP"), heat pump water heaters ("HPWH"), and ground source heat pumps ("GSHP"). In addition, the program offers incentives for envelope improvements, heat pump controls, and energy recovery ventilators/heat recovery ventilators ("ERV/HRV") when paired with an eligible heat pump system. Market development efforts include support for training and qualification of contractors, processes to assure quality installations, and marketing and education to help customers select options and operate systems optimally. A visual representation of air and ground source heat pumps is located below in **Figure 15**.

[108] Case 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative* ("NENY Proceeding"), Order Adopting Accelerated Energy Efficiency Targets ("Accelerated Efficiency Order") (issued December 13, 2018).
[109] Note 13, *supra*.
[110] NENY Proceeding, Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios Through 2025 ("2020 NENY Order") (issued January 16, 2020).
[111] NENY Proceeding, Con Edison Petition to Support Clean Heat Market Growth (filed February 24, 2022), p. 5.
[112] Note 1, *supra*, p. 21.
[113] *Ibid*, p. 15.

Figure 15: Heat Pump Technologies



The NYS Clean Heat Program for Con Edison currently offers 10 categories of incentives that are specific to the technology and sector, including residential, multifamily ("MF"), small and medium business ("SMB"), and commercial and industrial ("C&I"), with additional incentives available for HPWHs through both custom categories and the Midstream Program. Across all sectors, incentives are limited to the listed rates or 50 percent of project costs, whichever is lower. Information on incentive levels and eligibility can be found in Con Edison's Heat Pump Program Manual.[114]

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Relaunched the Clean Heat Program on January 17, 2023, accepting new applications for projects installed under a modified program framework designed to operate within approved budgets.
- Achieved the Commission's energy savings target almost four years ahead of schedule, electrifying over 34,000 dwelling units across the Company's service territory.
- Transferred unspent and authorized funding to support the Company's implementation of the Clean Heat Program and developed a Continuity Funding Mechanism ("CFM") to stabilize program momentum.
- Established an LMI-focused Clean Heat Joint Management Committee ("JMC") along with NYSERDA with the aim to develop a statewide low- and –moderate income ("LMI") portfolio of EE and building electrification programs for LMI customers.

Con Edison commenced the Clean Heat Program in March 2020 and experienced resounding growth in the latter half of 2021 and Q1 2022. In February 2022, the Company filed a petition with the Commission for additional program funding to address the robust response from the market. Con Edison's participation in the NYS Clean Heat Program had achieved 215 percent (2.15 TBtu, illustrated in Table 11 below) of its cumulative NENY Million British thermal unit ("MMBtu")

[114] Note 16, *supra*.

savings target, electrifying over 34,000 dwelling units since 2020, which accounts for five percent of the total CLCPA Scoping Plan's goal for the Company's service territory. By April 2022, the Company's Clean Heat Program exceeded the overall 2021-2025 energy savings target. In response, the Company announced a pause on accepting new applications for ASHP incentives for the Clean Heat Program in May 2022 and revised its petition as recently as July 2022.[115]

Table 11: Con Edison Clean Heat Program Spend & Achievement 2020-2022 Compared to NENY Budget

Category	Spend ($)	Savings (MMBtu)
Cumulative 2020-2022 Spend/Achievement	**$510,590,975**	**2,153,617**
Cumulative NENY 2020-2025 Budget/Target	**$227,315,835**	**1,000,000**
Share of NENY Budget/Target Realized Through 2022	**225%**	**215%**

On August 11, 2022, the Commission authorized the Company's request for additional funding via its Order Approving Funding for Clean Heat Program ("Con Edison Clean Heat Order").[116] The Con Edison Clean Heat Order also provided guidance to modify aspects of the program prior to accepting new projects. This included working with DPS Staff, stakeholders, and market participants to implement necessary changes to relaunch the program, such as redesigning incentive mechanisms to operate the program efficiently within the CFM. The CFM provided the necessary funding to relaunch and continue the Clean Heat Program until the conclusion of the NENY Interim Review. The CFM is capped at $10 million in expenditures per month and any unspent funds will carry over to be utilized in subsequent months. Through this program, Con Edison has supported a rapid acceleration of clean heat installations within its service territory and has helped drive market evolution towards decommissioning of legacy heating equipment.

Throughout 2022, the Company also worked in collaboration with the Joint Efficiency Providers, shoring up efforts to develop, support, and improve the NYS Clean Heat Program. Key accomplishments were distributed into three categories: (i) program administration, (ii) process improvements, and (iii) heat pump incentives. Specifically, Con Edison collaborated with the Joint Efficiency providers on improving application process cycle times, effectively reducing application errors and turnaround time for resolution. The Company also maintained and improved key communications including the NYS Clean Heat Program Manual and Implementation Plan, participated in working group series for Participating Contractors and Industry Partners ("PC&IP"), and hosted monthly webinars to engage with contractors and market partners.

Con Edison removed the Clean Heat Program pause on January 17, 2023, and subsequently began accepting new applications for projects installed under a modified program framework designed to operate within the approved budgets. The Commission authorized the Company's request to transfer unspent and authorized funding, totaling $518 million, to support the Clean Heat Program's accelerated rate of growth across the service territory. Under the Commission's guidance, the Company continued to apply the $10 million monthly CFM to sustain the Clean Heat Program.

[115] NENY Proceeding, Updated Consolidated Edison Clean Heat Petition (filed May 13, 2022).
[116] NENY Proceeding, Order Approving Funding for Clean Heat Program ("Con Edison Clean Heat Order") (issued August 11, 2022).

Future Implementation and Planning

Summary of Future Actions

- Provide ongoing program and stakeholder support for Clean Heat Program.
- Pursue additional installations and electrification categories across all market sectors (e.g., multifamily, small and medium business, etc.).
- Continue collaboration with the Joint Utilities and NYSERDA (collectively, the "Joint Efficiency Providers"), working with technical experts, manufacturers, and other industry partners to explore and expand the range of technologies available for Clean Heat incentives.
- Continue to meet state and local policy requirements and work towards clean energy goals.

Although Con Edison does not have dedicated building electrification budgets for LMI customers, they can participate in clean heat offerings. The Company looks forward to engaging regulators and stakeholders to extend the clean heat framework to include dedicated offerings for LMI customers.

Achieving the Clean Heat Program goals outlined above will convert fossil fuel systems to new electric demand. Con Edison is committed to preparing its system grid for these building electrification loads through the forecasting and planning processes (described in **Sections 2.1 – Integrated System Planning** and **Section 2.2 – Advanced Forecasting**). Integrating Clean Heat program data into customer project management systems and reviewing electrification scenarios as part of the CGPP will also help the Company plan for and build LT&D infrastructure to address spot challenges where dense neighborhoods rapidly electrify.

Risks and Mitigation

The success of Con Edison's EE programs over the past several years highlights the achievement and foresight of Department of Public Service Staff and the Commission in designing an EE framework that works for New Yorkers. Allowing the flexibility to implement, modify, launch, and retire pilots and programs designed for their specific service territory has been a key ingredient of that success. The clean energy market historically moves quickly and the ability to respond and adjust programs in step with the market has been paramount in achieving program success.

Electric heat pumps continue to face headwinds as they compete with natural gas appliances for heating – both in terms of the upfront installation costs as well as the ongoing operating costs. Though market uptake has grown significantly in the past several years and the Commission has committed funding for the interim continuance of this program,[117] further support is needed to build on the market momentum achieved to date and accelerate adoption.

Stakeholder Interface

The Company continues to collaborate with the Joint Efficiency Providers to develop, support, and improve the NYS Clean Heat Program. Through the Joint Efficiency Providers, Con Edison assisted with conducting a range of program administration activities and implementing continuous improvement practices to make implementation more efficient, making rules and communication clearer and responding to participant feedback and market developments. Additionally, the Company collaborated with the JMC and NYSERDA to develop LMI EE and building electrification solutions aimed at advancing affordability and access to EE for LMI residents.

[117] *Ibid*.

Additional Details

This section responds to the questions specific to clean heat integration.

1. **Using a common framework (organization, format, semantics, definitions, etc.) developed jointly with the other utilities, identify and characterize the existing and clean heat installation scenarios in the utility's service territory. Each scenario identified should be characterized by:**

    a. **the type of location (single family residence, multifamily residence, commercial space, office space, school, hospital, etc.);**

Within the Clean Heat Implementation Plan, the following installation scenarios are described in terms of their applicability to various building types, which are:

- Residential – one to four dwelling units
- Multifamily ("MF") – five or more dwelling units
- Small and medium business ("SMB")
- Commercial and industrial buildings ("C&I")

    b. **the number and spatial distribution of existing instances of the scenario;**

The primary driver for program participation, as evidenced by the increased and cumulative number of installations, is attributed to the residential sector. In 2022, ASHP installations with decommissioning of existing fossil fuel heating systems increased from roughly 8 percent in 2021 to 23 percent in 2022. A snapshot of installations by sector is depicted in Table 12 below.

Table 12: Total Number of Air Source Heat Pump Installations by Sector[118]

Sector	Cumulative Projects Installed and Provided Incentives 2020-2022
Residential	**22,819**
Multifamily	**183**

    c. **the forecast number and spatial distribution of anticipated instances of the scenario over the next five years;**

Con Edison forecasts overall program achievement under the constructs of the CFM but does not forecast at a granular level with regards to location and spatial distribution within its service territory. Con Edison also created a new load modifier for heating electrification to the winter peak forecast.

[118] New York State Clean Heat Program 2022 Annual Report (filed April 3, 2023): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={E0CC4887-0000-C417-A03D-FD2C60853794}.

d. the type(s) of clean heat solution installed at a typical location (ASHP, GSHP, HPWH, etc.);

The NYS Clean Heat Program for Con Edison provides 10 categories of clean heat solutions differentiated by sector. The categories are as follows:

- Category 2a — *cold climate ("cc") ASHP Residential Full Load Heating with Integrated Controls*
- Category 2b — *ccASHP Residential Full Load Heating with Decommissioning*
- Category 2c — *ASHP MF Full Load Heating with Decommissioning*
- Category 2d — *ASHP SMB Full Load Heating with Decommissioning*
- Category 3 — *GSHP Residential Full Load Heating*
- Category 4 — *Custom Full Load Space Heating Applications*
- Category 4a — *Custom Full Load Space Heating Applications + Envelope*
- Category 5 — *HPWH (up to 120 gallons of tank capacity)*
- Category 6 — *Custom Hot Water Heating Applications*
- Category 10 — *C&I Custom Partial Load Space Heating Applications*

e. an hourly profile of a typical location's aggregated clean heating load over a one-year period;

The Company does not currently forecast the hourly profile of a location's aggregated clean heating load over a one-year period.

f. the type and size of the existing utility service at a typical location; and

The type and size of the existing utility service vary based on the location.

g. the type and size of utility service needed to support the clean heating use case.

The type and size of utility serviced needed to support clean heating use cases will depend on the level of electrification (e.g., 100 amp versus 200 amp) and the various sizes of dwelling units (e.g., apartments versus homes, etc.). The right size level of utility service needed will likely become clearer as Company heat pump installations are levelized.

2. Describe and explain the utility's priorities for supporting implementation of the clean heating use cases anticipated in its service territory.

In its NENY Order,[119] the Commission initiated a common statewide heat pump framework for New York State, designed to guide the efforts of the joint utilities and NYSERDA in this area. The electric utilities and NYSERDA (collectively, "Joint Efficiency Providers") support the State's ambitious clean energy policies and particularly its efforts to advance the development of EE resources and building electrification. This Clean Heat Program Implementation Plan ("CHIP" or "Implementation Plan") is a key element of the State's clean energy pathway and is designed to support customers in transitioning to energy-efficient electrified space and water heating technologies.

[119] Note 110, *supra*.

3. **Identify and describe all significant resources and functions that the utility and stakeholders use for planning, implementing, monitoring, and managing clean heating at multiple levels in the distribution system.**

    a. **Explain how each of those resources and functions supports the utility's needs.**

Con Edison is dedicated to meeting its clean heat implementation goals by acquiring projects, providing the necessary metrics on deployments, expenditures, and energy savings, enhancing the overall customer experience, and maintaining its fiduciary responsibility to its shareholders. Additionally, the Company provides external stakeholder engagement, sector-specific program teams for interfacing between customers, contractors, and implementation contractors, support functions, data management, and marketing teams.

    b. **Explain how each of those resources and functions supports the stakeholders' needs.**

On behalf of stakeholders, the Company's teams are supporting quality installations to meet customer heating needs and maintain an efficient program for contractors, distributors, and implementation contractors.

4. **Identify the types of customer and system data that are necessary for planning, implementing, and managing clean heating infrastructure and services and describe how the utility provides this data to interested third parties.**

The Company leverages customer data to help determine program eligibility such as name, address, and account number. In turn, customers can monitor their consumption data through AMI, allowing them to engage in more efficient energy habits. However, Con Edison does not share this data with third parties. The Company's use of system data for EoH, or heat pumps, are incorporated as a load modifier that aids in the reduction of the total forecasted system load (or gross load), applied in the winter peak forecast.

5. **By citing specific objectives, means, and methods describe in detail how the utility's accomplishments and plans are aligned with New York State policy, including its established goals for clean heat adoption.**

Con Edison supports the continuation of the Clean Heat Program as vital to helping New York State meet its climate goals. The Company will continue to work with the Commission, DPS Staff, participating contractors, stakeholders, and customers to adapt this program given observed levels of market activity. To date, the Company has exceeded the 2025 target of 1 TBtu by 215 percent, electrifying over 34,000 dwelling units in their service territory.

6. **Describe the utility's current efforts to plan, implement, and manage clean heat-related projects. Information provided should include:**

    a. **a detailed description of each project, existing and planned, with an explanation of how the project fits into the utility's long-range clean heat integration plans;**

Each individual Clean Heat project varies in multiple aspects, including technology used, project schedule, and approved incentive levels. However, every Clean Heat project plays an important role in realizing the Company's long-term goals to achieve statewide heat pump goals and build the market infrastructure for a low-carbon future.

    b. **the original project schedule;**

Original Clean Heat project schedules vary widely from one another depending on individual customer, contractor, and sectoral factors. The Company's original schedule was to achieve 1 TBtu of savings across its service territory by 2025.

c. the current project status;

The Company has currently achieved 215 percent of its cumulative NENY MMBtu savings goal, electrifying over 34,000 homes and saving 2.15 TBtu since 2020. Con Edison has experienced a marked increase in Clean Heat Program applications, particularly in the residential sector.

d. lessons learned to-date;

To date, market demand for clean heat technologies has remained high and consistent across the Company's service territory. As such, the Company understands the importance of managing a Clean Heat Program that sustainably meets this considerable demand. In addition, the Company recognizes significant differences between downstate and upstate utility service territories. Market participants within the Company service territory require program rules and guidelines that are tailored to address their unique circumstances.

e. project adjustments and improvement opportunities identified to-date; and

On August 11, 2022, the Commission granted the Company's request for additional funding to support Clean Heat Program growth in its service territory through a CFM. The Company continues to employ the monthly $10 million CFM, pending Commission action to the NENY Interim Review.

f. next steps with clear timelines and deliverables.

Con Edison is running the Clean Heat Program within the confines of the CFM as ordered by the Commission until the Commission reviews the Clean Heat Program as part of its NENY Interim Review.

7. Describe how the utility is coordinating with the efforts of the New York State Energy Research and Development Authority (NYSERDA), the New York Power Authority (NYPA), New York Department of Environmental Conservation (DEC), DPS Staff, or other governmental entities to facilitate statewide clean heat market development and growth.

Con Edison regularly coordinates and collaborates with State agencies, authorities, and stakeholders alike on electrification efforts across its service territory, including the installation of heat pumps. The Clean Heat Program is implemented in close coordination with a portfolio of NYSERDA-led market development initiatives, which are designed to build market capacity that deliver building electrification solutions. Market development efforts include, but are not limited to, workforce development efforts that support clean heat technologies and marketing and education initiatives for customers and other stakeholders. When projects are eligible for both Clean Heat Program incentives as well as NYSERDA program funding sources, projects may be eligible to receive funding from both provided that each program supports achievement of distinct outcomes.

Additionally, the Company collaborates with DPS Staff on the Clean Heat Program's implementation and continued program support. For example, Con Edison worked in consultation with DPS Staff, stakeholders, and market participants to implement the $10 million CFM supporting the Clean Heat Program's steady growth within the Company's service territory.

The Company will continue to closely coordinate clean heat efforts with NYSERDA, NYPA, DEC, DPS Staff, and other stakeholders.

2.7. EE INTEGRATION AND INNOVATION

Context and Background

The Energy Efficiency ("EE") landscape has continued to evolve since the Company last filed its DSIP in 2020. EE plays a critical role in helping the State to meet its climate policy objectives through the expansion of targets, programs, and overall investments. As formalized in the Commission's Accelerated Efficiency Order[120] and the CLCPA,[121] the State-established a goal of reducing customer energy usage by 185 TBtu statewide by 2025.[122] As part of that effort, the Commission's NENY Order[123] directs an incremental 35.8 TBtu of energy savings. Related goals include a 3.0 percent annual reduction in electricity sales and 1.3 percent annual reduction of natural gas sales by 2025; an aggregate reduction of 3.6 TBtu through heat pump deployment; and the continued provision and enhancement of programs for low- and moderate-income ("LMI") customers.[124]

Con Edison recognizes that to advance the achievement of statewide goals, EE targets and budgets need to be expanded in step with continually refined priorities driven by the State's carbon emission reduction goals. The Company's EE priorities include the following:

- Pursuing deeper and more sustainable savings measures, including building envelope upgrades, heat pumps, and waste heat recovery;
- Continuing to grow participation in these programs by LMI customers and DACs; and
- Encouraging innovation and flexibility in program design, allowing the Company to implement, refine, and retire pilots and programs while retaining the capability to direct funding across portfolios

[120] Note 108, *supra*.
[121] Note 13, *supra*. .
[122] Note 110, *supra*.
[123] *Ibid*.
[124] *Ibid*.

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Achieved 1,836,009 MMBtu of electric savings, eclipsing the original NENY electric target as of year-end 2022.
- Surpassed 1 million MWh in energy savings from the SMB Program since its inception, increasing the average project size from 25 MWh to 30 MWh.
- Launched Real-Time Energy Management ("RTEM") Pilot in January 2023, offering incentives for implementing operational energy conservation measures identified by RTEM systems.
- Completed seven evaluations across the Company's non-LMI EE portfolio as part of a continuous effort to validate savings.
- Launched new Secondary Steam savings offerings for building management system controls and envelope projects.
- Expanded offerings for LMI customers through the statewide LMI EE effort.

The Company is driving additional, innovative efforts as its EE and peak reduction goals continue to increase as a result of shifting State climate policy. In 2022, the Company achieved 1,836,009 MMBtu of annual electric savings in its non-LMI portfolio, expending $81 million in support of electric EE portfolio efforts. These 2022 efforts resulted in a combined savings of 1,878,149 MMBtu for electricity and 821,418 MMBtu for gas, encompassing both LMI and non-LMI portfolios. The Company's total expenditure for all electrical EE portfolios amounted to $86.6 million. Con Edison focused on growing savings from EE measures, such as heating electrification, heating, ventilation, and air conditioning ("HVAC") equipment upgrades, and other building equipment or systems upgrades across multiple programs and sectors. These measures provide deeper and more durable reductions in energy use, but at a higher unit cost[125] compared to lighting measures. Overall, the Company increased the percentage of savings coming from non-lighting measures from 37 percent in 2021 to 43 percent in 2022.

A snapshot of Con Edison's electric EE program performance is located below in **Table 13**.

[125] These measures often involve more expensive equipment and other costs (*e.g.*, building renovation and occupant disruption).

Table 13: NENY EE Program Performance (2022)

	Program	Highlights	Electric Savings (MMBtu)	Gas Savings (MMBtu)	Total Energy Savings (MMBtu)
Commercial Sector	***Small and Medium Business ("SMB")***	• The SMB Program surpassed 1 million MWh in total savings acquired and the average electric project size grew from 25 MWh to 30 MWh. • The program increased deeper savings (non-lighting) year-over-year by 64 percent.	**241,987**	**4,869**	**246,856**
	C&I	• The C&I Program launched new lighting offerings including streamlined incentives, simplified eligibility requirements, and a new lighting calculator. The program also launched new Secondary Steam saving offerings for building management system ("BMS") controls and envelope projects. • The C&I Program delivered significant savings through deeper custom measures.	**228,413**	**189,384**	**417,797**
	Instant Lighting	• The program added offerings for fixtures and retrofit kits to the program in February 2022.	**65,281**	**-**	**65,281**
	Commercial Kitchen	• Updated participant eligibility to permit manufacturers to enroll directly to capture savings for national accounts.	**10,449**	**9,802**	**20,301**
Multifamily Sector	***Multifamily***	• The Multifamily Program continued to diversify the measure mix specifically for electric energy conservation measures, increasing the number of projects that are non-lighting. • Con Edison worked with multifamily building owners to build out longer-term EE and building electrification plans.	**43,476**	**180,185**	**223,661**

Residential Sector	***Retail Lighting***	• Customers continued to benefit from EE upgrades at affordable costs due to this program.	**964,526**	**-**	**964,526**
	Residential Home Energy Reports ("HER")	• Program team cross-promoted with other residential programs to gain better customer insights. • Program team added new participants to the program to address a shortfall in savings compared to program goals.	**231,206**	**40,509**	**271,715**
	Residential Weatherization	• Increased Collaboration with NYSERDA and its Comfort Home Program Team. • Offered a limited-time-offering to prior Clean Heat participants to receive additional incentives for weatherizing their homes.	**4,878**	**10,917**	**15,795**
	Smart Kids	• Participation in the high school Smart Kids Program, which began in 2021, continued to rise as prospective participants showed interest in the program.	**27,262**	**21,363**	**48,625**
	Marketplace	• Program added new measures to the Marketplace Platform.	**17,097**	**12,272**	**29,369**
Pilots	***Pilots***	• Completed customer acquisition for the Oil to Electric Pilot. • Completed customer acquisition for the Heat Pump Demand Pilot. • Launched RTEM Pilot and received the first three applications.	**No savings claimed in 2022**	**-**	**-**
LMI	***LMI***[126]	• Launched an eligibility screener initiative in July 2022 to fast-track AMEEP customer eligibility. • Launched initiative through AMEEP in partnership with New York City Housing Preservation & Development ("NYC HPD") and NYC Accelerator to help buildings identify and install the prescriptive energy conservation measures required by LL97.	**58,399**	**352,117**	**410,516**

The Company continues to make operational improvements to serve customers, including offering customers multiple options and opportunities to reduce their energy use based on their unique needs. Examples for residential customers

[126] Gas and electric portfolio savings, excluding LMI households, are reported as Verified Gross Savings ("VGS"). LMI savings, which consist of both evaluated and unevaluated programs, are reported as gross gas and electric savings.

include accessing rebates and incentives through market partners, shopping directly through the Online Marketplace, managing energy and demand through programmable thermostats and Wi-Fi-enabled air conditioners, and benefiting from market-based partnerships between Con Edison and midstream and upstream retailers and manufacturers.

Examples for commercial customers include prescriptive incentives for EE technologies such as high efficiency lighting and controls, chillers, HVAC measures, insulation, and variable frequency drives ("VFD"). The Company also offers rebates for custom efficiency projects, encouraging C&I customers to identify energy-saving opportunities and implement cost-effective retrofit projects. Both residential and commercial customers are also eligible for Clean Heat Program incentives which are discussed in detail in **Section 2.6**.

The Company's EE programs also seek to increase customer engagement and choice. The Company provides customers with actionable insights and the ability to efficiently manage their energy needs, while creating broader system and grid benefits. For example, the Company provides energy audits, educational materials, access to information on efficient products and services, and promotion of controllable technologies.

Additionally, Con Edison expanded its engagement with LMI customers. The Company remains committed to developing and administering new programs that align with the CLCPA[127] goal of achieving 35 to 40 percent benefits for DACs. In 2022, Con Edison achieved 6,634 MWh of electric energy savings and 348,061 MMBtu in gas savings through participation in the AMEEP and further distributed 11,448 EE kits to customers participating in Con Edison's Energy Affordability Program, which provides energy bill payment assistance for income qualifying participants. Con Edison also collaborated with food pantries to distribute 62,544 packs of LEDs to low-income customers. In total, Con Edison's LMI Program offerings contributed 17,115 MWh of electric savings and 352,117 of gas savings in 2022. A detailed list of 2022 LMI efforts is found in the annual Statewide LMI Portfolio Report.[128]

Future Implementation and Planning

Summary of Future Actions

- Focus on expanded program savings and budgets to pursue deeper energy savings.
- Participate in ongoing stakeholder processes on the future of EE and building electrification in New York.
- Explore new and innovative approaches to enable competitive markets and new EE products and services.
- Expand Evaluation, Measurement, and Verification ("EM&V") efforts to address divergences in reported vs. verified savings, improve communication, and further refine procedures, including using Advanced Metering Infrastructure ("AMI") data where appropriate.
- Continue collaboration through Strategic Energy Partnerships ("SEP") to expand EE savings.
- Develop and launch Utility Thermal Energy Network ("UTEN") pilot projects.

Con Edison is growing its EE services and offerings to meet New York State's ambitious policy goals, spur continued market innovation, and create system benefits. The Company continues to explore new approaches to supply chain management to enable competitive EE markets as well as flexible program design to pursue deeper and more durable energy savings.

[127] Note 13, *supra*, p. 16.
[128] Statewide Low- and Moderate-Income Portfolio Report 2022 (fielded April 1, 2023): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b405A4887-0000-C534-B80B-78688032A836%7d.

The Company continues to integrate new technology and evaluation methods into its EM&V efforts. The Company incorporates AMI interval consumption data, where available, into program analyses. This aligns with the Company's goal to get real-time feedback on programs through standardizing quality assurance/quality control ("QA/QC") across its portfolio, targeting measurement and verification ("M&V") on new technologies, and increasing focus toward rolling evaluation.

Additionally, the Company continues to foster relationships with heavy energy usage customers through its SEP Program. The Company meets with customers to evaluate project information with the goal of building out long-term roadmaps to address time-intensive opportunities for deeper energy savings. In addition to partnership work with SEP customers, Con Edison continues to collaborate with NYSERDA on various EE programs and pilots aimed at developing the market and incentive programs required for creating EE savings.

To implement the Thermal Energy Network and Jobs Act ("Thermal Networks Act"),[129] the Commission ordered[130] the seven largest utilities, including Con Edison, to propose at least one UTEN pilot project in September 2022. The Company is committed to developing UTEN projects that can aid in achieving key learning objectives, test scalability, and inform future policy. Testing new utility-owned networks will leverage the Company's existing expertise in owning and managing large-scale distribution networks to provide safe, reliable, and resilient energy to diverse customer types while demonstrating the value of ambient loop systems at scale. In support of the Commission's order, Con Edison is proposing to develop the following three discrete UTEN projects to maximize learning opportunities:

- Project Type A: High-Rise Commercial and Industrial Buildings
- Project Type B: Large Residential Buildings in Dense Urban Area
- Project Type C: Smaller Buildings in Less Dense Areas

UTILITY THERMAL ENERGY NETWORK

A UTEN is an ambient temperature loop system which connects multiple buildings by using some variation of GSHPs, geothermal infrastructure, waste heat energy, and utility-owned load balancing systems.

The Company submitted a supplemental filing in May 2023 seeking approval and authorization of budget and pilot project development.

The Company will introduce new efficient products, services, and program models as technologies develop, economic trends shift, and customer preferences and behavior patterns change. The Company will seek to increase customer engagement and choice through EE programs, providing customers with actionable insights and the ability to efficiently manage their energy needs while creating broader system, grid, and environmental benefits.

Risks and Mitigation

Energy Efficiency is part of the Company's core utility business. Recent changes to lighting standards and baselines present challenges for the EE Portfolio on how to continue to meet program targets with current budgets. Additionally, building envelope and building management system projects under the C&I Program often require a longer timeline compared to other projects in the program and, in some instances, more complex savings calculation methodologies.

[129] Laws of 2022, Chapter 375 (enacted July 5, 2022).
[130] Case 22-M-0429, *Proceeding on Motion of the Commission to Implement the Requirements of the Utility Thermal Energy Network and Jobs Act* ("Thermal Energy Network Proceeding"), Order on Developing Thermal Energy Networks Pursuant to the Utility Thermal Energy Networks and Jobs Act (issued September 15, 2022) ("Thermal Energy Networks Order").

Custom calculations can be a barrier to participation as projects become more complex and customers may lose clarity on potential energy and cost savings.

The Company will continue to work to reduce costs and expects to benefit from those efforts in some programs in the short term. However, despite efforts to reduce unit costs, the Company recognizes that as lower-cost measures and programs, such as lighting, reach saturation, and as the Company works with customers to achieve greater and deeper levels of savings per residential or commercial building, the per unit cost of energy saved may increase over the medium to long term.

To overcome these challenges in meeting EE goals, the Company continues to explore and implement new strategies for EE programs including remote energy audits, additional strategic partnerships with large energy users, investments in new energy-saving technologies and market channel strategies, and a continued emphasis on achieving deeper savings.

Stakeholder Interface

The Company coordinates with the Joint Utilities, and – in the case of the statewide LMI EE portfolio of programs, with NYSERDA – to exchange lessons learned and best practices. Further, the Company engages with and seeks feedback from customers across sectors to implement program changes as appropriate.

Additional Detail

This section responds to the questions specific to EE integration.

1) **The resources and capabilities used for integrating energy efficiency within system and utility business planning.**

Con Edison's EE programs play a significant role in reducing system peak, minimizing demand growth, and deferring large utility investments. The Customer Clean Energy ("CCE") Programs department, which runs the EE programs, is within the larger Customer Energy Solutions ("CES") organization, which also includes groups that lead program design and delivery, including procurement of NWS, demonstration projects, and distribution planning, among others. There is close collaboration among the groups to leverage EE as a resource, including targeting EE temporally and spatially to help meet system needs. **Section 3.1** provides a more detailed discussion of the CES organization.

These groups coordinate with other groups across Con Edison to integrate EE into other business planning processes. For example, CCE provides volume and peak reduction forecasts to the relevant user groups within Con Edison for budget and capital project/system expansion planning purposes. **Appendix A** describes in detail how the Company incorporates these EE forecasts as load modifiers, reducing the system forecast.

2) **The locations and amounts of current energy and peak load reductions attributable to energy efficiency and how the utility determines these.**

Through the Company's BQDM Program and other NWS projects, Con Edison is deploying EE to target identified local distribution system needs.

For more generalized programs, the Company tracks program participation down to the customer premises, where applicable. The Company uses this information to review and improve the effectiveness of existing programs and inform future program design. As the Company pursues upstream and midstream delivery channels to reach additional customers, it captures customer participation data at a higher level, such as by vendor or local store, as opposed to the individual end-user. The Company is currently developing and testing the methods and models that it can use to

attribute savings to programs for which the Company does not currently have end-user participation data.

3) **A high-level description of how the utility's accomplishments and plans are aligned with New York State climate and energy policies and incorporate innovative approaches for accelerating progress toultimately align with the CLCPA.**

As described above, Con Edison continued to implement its System Energy Efficiency Plan ("SEEP").[131] Additionally, the Company actively engages with stakeholders to improve program design and implement programs that cost-effectively meet the needs of customers and communities. The Company's current and planned REV demonstration projects and NWS, as well as innovative EE, system peak reduction, and EV programs, align with the shared goals of the Company, Commission, and stakeholders. These efforts continue to result in a more efficient consumption profile while providing reliable, safe, and sustainable energy service.

4) **Summary of information on energy efficiency programs offered by the utility, with direction to annual filings for more detailed information on energy efficiency programs.**

Commercial Sector

The Company offers a range of custom and prescriptive EE programs serving C&I customers. Commercial programs are tailored to suit the needs of specific commercial markets such as large commercial buildings, small commercial buildings, commercial kitchens, and schools.

Commercial & Industrial ("C&I")

The C&I Program provides prescriptive incentives for energy-efficient technologies, such as high-efficiency lighting and controls, chillers, HVAC measures, insulation, and VFDs. The program is currently available to individually metered commercial customers who are billed on a commercial rate schedule.

The program also offers rebates for custom efficiency projects. The custom track is a flexible and innovative equipment replacement program designed to encourage C&I customers to identify energy-saving opportunities and implement cost-effective retrofit projects. Custom projects involve the installation of non-lighting measures that are not qualified for the prescriptive track and, as such, require additional engineering analysis to determine energy savings.

Instant Lighting

The Instant Lighting Program provides point-of-purchase discounts to commercial electric customers for LED lighting upgrades. Customers receive discounts instantly on eligible ENERGY STAR®-certified and Design Lights Consortium-listed lamps at the point of sale when they purchase from one of our program participants.

Small and Medium Business ("SMB")

The SMB Program offers Con Edison's small to mid-size commercial customers with solutions for upgrading existing lighting, HVAC, refrigeration, and gas equipment to more energy-efficient equipment. The SMB Program subsidizes the costs of upgrades and provides direct-installation services, making these types of investments more affordable and

[131] Con Edison 2022 System Energy Efficiency Plan (SEEP) Annual report (filed March 1, 2023): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={704E3987-0000-C71C-899D-50724E47E02C}.

accessible to small commercial customers while having a positive impact on their bottom line by reducing their energy costs.

Small and Medium Business Program participants commonly include restaurants and food stores, retail, offices, healthcare or fitness centers, warehouses and manufacturing, and small services (e.g., coffee shops, nail salons, laundromats, etc.). Small and Medium Business Program operations are managed through an implementation contractor.

Commercial Kitchen

The Commercial Kitchens Program is a midstream program that incentivizes high-efficiency food service and life science lab equipment. As part of the program, Con Edison partners with equipment dealers to offer rebates at the point of sale to commercial customers and to veterans-service and religious organizations on residential rates for the purchase and installation of energy-efficient food service and lab equipment.

Residential Sector

Marketplace

The Con Edison Marketplace is an e-commerce platform that provides Con Edison customers instant discounts for the purchase of LED bulbs, smart thermostats, and advanced power strips.

Residential Weatherization

The Residential Weatherization Program offers incentives to single-family homes to increase the adoption of insulation, air sealing, duct sealing, and learning thermostats in the Company's service territory.

Residential Home Energy Reports ("HER")

The HER Program is a behavioral program designed to motivate customers to use less energy and save money on monthly bills by providing customer-specific energy usage reports, including "neighbor" comparisons and personalized energy-saving advice. This program aims to empower customers to take control of their usage by providing energy-saving recommendations via email and printed mailers. The HER Program also provides Con Edison with measurable and verifiable information about customer behavior. This program delivers HERs to both electric and gas customers.

Smart Kids

The Smart Kids Program is designed to educate fifth grade and high school students across the Company's service territory on the role energy plays in their daily lives and give them the tools to learn real-world energy-saving tactics by providing them with an EE kit, which includes EE measures and a workbook.

Multifamily Sector

The Multifamily Energy Efficiency Program ("MFEEP") promotes EE for existing multifamily electric and gas customers with five or more residential units. The multifamily market consists of nearly 70,000 residential buildings across New York City and Westchester County. The program is designed to help building owners and property managers of multifamily buildings reduce energy consumption and save money on utility bills while also helping to reduce GHG emissions.

The program offers incentives for a range of energy-saving measures, including prescriptive and custom rebates for both

gas and electric measures. In-unit LEDs, faucet aerators, and showerheads are also available through the program. Prescriptive rebates are offered for a list of mainstream EE measures that can be installed by any participating contractor that is qualified under the program. Custom rebates are for an open-ended EE technology category that requires a site-specific analysis to estimate energy savings.

Low- and Moderate-Income Sector

Affordable Multifamily Energy Efficiency Program ("AMEEP")

The Affordable Multifamily Energy Efficiency Program is the statewide LMI multifamily program designed and managed collaboratively by the Joint Utilities in collaboration with NYSERDA. The program offers incentives for the installation of energy-efficient equipment and technology in existing affordable multifamily housing.

Additionally, Con Edison has conducted efforts focused on increasing education and awareness about EE, as well as providing energy efficient equipment for use in the home. In 2022, Con Edison distributed 11,448 kits to customers participating in Con Edison's Energy Affordability Program, which provides bill assistance. This program is an opt-in only program, where eligible customers can claim a kit online. Kits can contain three LED lightbulbs, two faucet aerators, and a low-flow showerhead. Con Edison also collaborated with food pantries to distribute 62,544 packs of four LEDs to low-income customers.

Detailed information on Con Edison-supported EE programs is located in the links below in Table 14.

Table 14: Con Edison Annual Fillings for EE Programs

Report	Link
Con Edison 2022 SEEP Annual Report	https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={704E3987-0000-C71C-899D-50724E47E02C}
Con Edison SEEP (2019-2025)	https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={6424CB37-848B-4627-9BF5-D72905B59D7A}
Statewide LMI Portfolio 2022 Annual Report	https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={405A4887-0000-C534-B80B-78688032A836}

5) **Describe how the utility is coordinating and partnering with NYSERDA's related ongoing statewide efforts to facilitate energy efficiency market development and growth.**

The Company is working with NYSERDA to create innovative, market-stimulating partnerships that take advantage of each organization's strengths. This includes, but is not limited to:

The Retrofit Electrification Pilot – aimed at reducing barriers to electrification adoption in existing affordable multifamily buildings by increasing retrofit opportunities in the NYC HPD Preservation pipeline.

The Clean Heat Program – creating support through the heat pump workforce programs, QA/QC, and providing upstream incentives for heat pump technologies. The Heat Pump Program was designed to help build market capacity to deliver building electrification solutions. For additional details on the Heat Pump Program, see Section 2.6.

Statewide LMI Portfolio – creating a more holistic and coordinated approach to deliver EE to LMI customers and communities in New York while increasing benefits for LMI customers seeking to access clean energy services, reducing

administrative costs, increasing cost-effectiveness, and providing more consistent and streamlined participation for service providers.

The Company will continue this coordination with NYSERDA and other stakeholders to facilitate EE market development and growth. The Company continues to work closely with NYSERDA through innovation sprints and providing solicitation information to NYSERDA's REV Connect portal.[132]

[132] NYSERDA REV Connect Portal: https://www.nyserda.ny.gov/All-Programs/Programs/REV-Connect.

2.8. DATA SHARING

Context and Background

New York is transforming its electricity system to support clean energy goals, system resiliency, and affordability. To accomplish the aggressive goals outlined by the Governor and the CLCPA, utilities, DER providers, and other stakeholders will need access to energy-related data. A combination of customer data and distribution system data, applied to agreed-upon, value-added use cases, could accelerate the adoption and deployment of clean energy solutions across the State.

Significant efforts in data sharing technology and methods have been made since the inception of the 2016 DSIP. The 2018 DSIP provided functional insight into the customer's energy choices and usage patterns and outlined improvements in sharing load and energy forecasts. The 2020 DSIP detailed expanded system data capabilities through hosting capacity map improvements as well as the implementation of GBC.

Data sharing – and adhering to privacy standards and cybersecurity protocols for this sharing – has been the subject of several regulatory orders since the 2020 DSIP. In 2020, PSC centralized data access topics in case 20-M-0082, *Proceeding on Motion of the Public Service Commission Regarding Strategic Use of Energy Related Data*. In 2021, the Commission issued two important data orders within this proceeding – the IEDR Order[133] and the DAF Order.[134]

The IEDR Order approved the phased design and implementation of a statewide IEDR Platform to centralize data access in support of New York's clean energy goals. This included a Phase 1 budget, which will enable the development of at least five priority data use cases over 24-30 months, and a Phase 2 plan that will enable over 40 additional data use cases by 2026.

INTEGRATED ENERGY DATA RESOURCE

The IEDR will be a single statewide platform that securely collects and integrates utility and energy-related data to support New York's clean energy and climate commitment.

DER providers, utilities, government agencies, and energy users alike can leverage the IDER's centralized capabilities for DER market enablement and policy support.

The DAF Order aims to standardize cybersecurity and privacy protections, data quality standards, and customer consent processes for third party access to energy data. Within this Order, the Commission:

- Ordered the implementation of a statewide Data Ready Certification ("DRC") to be administered by a third party vendor. The DRC will be used for third parties soliciting non-public information from the IEDR
- Adopted data quality and integrity standards for data sets delivered by the utility to third parties
- Adopted data performance metrics categories to measure effectiveness of data delivery
- Removed registration for hosting capacity maps

[133] Case 20-M-0082, *Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data* ("Data Proceeding"), Order Implementing an Integrated Energy Data Resource ("IEDR Order") (issued February 11, 2021).
[134] Data Proceeding, Order Adopting a Data Access Framework and Establishing Further Process ("DAF Order") (issued April 15, 2021).

- Removed data fees for customer energy usage under 24 months old
- Adopted a statewide data privacy aggregation standard of 4/50
- Required eight joint and individual utility filings between July-September 2021[135]

Additionally, the Commission has continued progress on the Utility Energy Registry ("UER") first established by a 2018 Order[136] as a vehicle for providing streamlined access to anonymized aggregated community-level energy data. In August 2021, the Commission issued an Order addressing NYSERDA's UER Status Report and directing NYSERDA to form a standing UER working group to manage and publish versions of the NY UER Protocols.[137] This Order also identified refinements and additions to the structure of the reported data fields and rebalanced the application of UER use case-specific privacy screens.

Con Edison recognizes the value of increased data and information sharing. The Company has continued to work with stakeholders and the Commission to investigate more efficient and robust means of exchanging system and customer data through the IEDR and DAF efforts, under the conditions outlined in the Company's data privacy policy. As outlined below, Con Edison has implemented policy guidelines and reasonable organizational, technical, and administrative measures to help safeguard customer information from unauthorized access or improper use.

Data Types

Con Edison considers two types of data sharing, 1) Customer Data, and 2) Distribution System Data. Customer data is further differentiated as customer-specific (non-aggregated) or aggregated.

Customer Data

Customer data consists of customer energy usage data, customer-sited generation data, account, and load profile information. Customer data can be customer-specific or aggregated, such as at the building or community level. Improving data access for customers through the provision of granular and timely usage and cost data can improve energy literacy and empower customers to make better energy choices. It's also important to note that customer consent to the dissemination of customer-specific information to third parties is crucial to maintaining the customers' trust. As described below, Con Edison, along with the Joint Utilities, continues to actively explore ways to enhance data sharing tools and improve access to customer-specific and aggregated data. The Company also works to balance the provision of customer data, particularly energy usage information, with sufficient anonymity and customer privacy controls.

Additionally, improved access to customer data can help DER developers and third parties tailor their products and services and conduct well-informed business development. Access to customer data can help local governments, State agencies, and academic institutions analyze the impacts of policies, track emissions, and create action plans. For these

[135] Filings under Case 20-M-0082, *Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data*, include, among others: The Joint Utilities' Inventory of Available Data Points Omitted from Appendix A of the Data Access Framework Order (filed July 14, 2021); The Joint Utilities' Proposal for an Alternate Method of Account Identification (filed July 14, 2021); The Joint Utilities' Green Button Connect User Agreement and Onboarding Process (filed August 13, 2021); The Joint Utilities' Consent Process Assessment and Customer Consent Engagement Plan (filed September 20, 2021); and The Joint Utilities' Data Access Implementation Plan ("DAIP") (filed September 20, 2021).

[136] Case 17-M-0315, *In the Matter of the Utility Energy Registry* ("UER Proceeding"), Order Adopting Utility Energy Registry ("UER Order") (issued April 20, 2018).

[137] UER Proceeding, Order Adopting Utility Energy Registry Modifications (issued August 12, 2021).

reasons, Con Edison supports easier access to more comprehensive data for customers and third parties with the appropriate privacy and cybersecurity protections.

At Con Edison, the growth in types of customer data and methods for sharing has been tied closely to the deployment of AMI. The Company is nearing completion of its AMI rollout, discussed in **Section 2.11**. Advanced metering enables customers to access and download their near-real time energy usage (i.e., 45-60 minutes after the interval ends), empowering them to make informed choices and adopt clean energy solutions that can reduce their monthly bill. The completion of the AMI rollout means data sharing, through GBC and other methods, will be available to all customers, giving them convenient access to more granular and timely data, and providing energy reports, savings tips, and ways to share their data with third parties.

The Company provides customer data to third parties through a variety of methods, including GBC under Share My Data, Electronic Data Interchange ("EDI") for DER developers, the UER, application program interfaces ("APIs") for Energy Service Companies ("ESCOs"), and is continuing to work closely with NYSERDA to develop and implement IEDR use cases. Additionally, Con Edison provides subscriber level data to CDG Hosts in support of CDG projects, including those participating in Net Crediting – described in greater detail in **Section 2.10**. Moreover, building owners can obtain aggregated consumption data for EE benchmarking, subject to the privacy standards established by the PSC, via the Company's EEB Portal.

Distribution System Data

Distribution system data includes load, voltage, power quality, capacity, equipment, and operating details. Since the Initial DSIP, Con Edison has made significant amounts of system data available through the Company's online data portal, which is accessible through its hosting capacity maps. This data provides greater transparency regarding areas of the Company's system that present high value for DER interconnection as well as lower interconnection costs, and greater visibility into system characteristics and needs, all of which respond to developer requests and foster DER market development.

Con Edison, in collaboration with the Joint Utilities, continues its commitment to expand accessibility and improve presentation of system data on the Joint Utilities' website and the utility online portals to better support stakeholder data needs. The details of new system data included in the hosting capacity maps are described in **Section 2.9**.

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Continued use case collaboration for IPV and MVP planning and deployment between the Joint Utilities, NYSERDA, and the IEDR Program Team.
    - Released 1.0.1 IPV which contains hosting capacity map data and incorporation of priority feedback items collected during User Acceptance Testing ("UAT").
- Provided access to an expanded range of customer-specific data through implementation of GBC Phase II and III on the Share My Data Platform, allowing third parties to access and download customers' near-real time energy usage.
- Increased the system data available through the hosting capacity maps including nodal level data and updated Storage Hosting Capacity Maps.
- Continued collaboration with ESCOs using APIs developed as part of the Share My Data Platform and implemented similar APIs for large customers for ESCOs & large customers.
- Continued discussions with stakeholders to identify the range of system data currently available and to better understand who is using the data, for what purposes, and how often, in order to prioritize future enhancements.

On March 10, 2023, the IEDR Development Team released their user UAT for the IEDR IPV, which is the first public version. Con Edison, along with the Joint Utilities, engaged internal SMEs to participate in the testing, validation, and provision of feedback for the UAT. Based on coordinated input from the Joint Utilities and stakeholders, the IPV version of the IEDR Platform was released on March 31, 2023. The IEDR IPV Platform[138] includes a detailed roadmap of upcoming releases including new or improved functionality.

The Company also continues to increase the breadth and granularity of data available and expand other methods of accessing data. Ongoing investments in AMI, Share My Data, and My Account are resulting in additional data being available in a format that is more usable to customers and third parties. The Company also continues to provide guidance and support to third parties on how to register for data access and receive data through secure, machine-to-machine processes including Share My Data and EDI.[139] For building benchmarking, the Company continues to support a web service to automatically import building data directly into Energy STAR Portfolio Manager® ("EPSM"), which is the Environmental Protection Agency's ("EPA") online tool for benchmarking energy and water consumption with similar buildings nationwide.[140] Lastly, to facilitate public access to aggregated customer data, the Company provides semi-annual data to the NYSERDA UER Platform for its service territory.

Customer-Specific (Non-Aggregated) Data

Con Edison provides a wide range of customer-specific data to customers and third parties through multiple data sharing mechanisms and platforms. Customers can access their account, billing, and usage data through the online My Account

[138] Note 9, *supra*.
[139] Con Edison How to Access Customer Data website: https://www.coned.com/en/business-partners/access-customer-data.
[140] Energy STAR® website: https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

portal, or by calling the Company and requesting up to two years of billing statements. My Account also includes the option for customers to download their usage data to a spreadsheet via the GBD tool.

Third parties are able to access customer-specific data via Share My Data and EDI, which has historically been the mechanism for sharing data with ESCOs for purposes of retail access and was extended to DER providers by the Commission in late 2017.[141] Since 2020, the Company has implemented third party enhancements to My Account Access, with the appropriate customer consent to view a customer's My Account profile, which includes billing, usage, and other customer information, including the ability to export data. All customer data sharing with DER providers is subject to the Uniform Business Practices for DERs ("UBP-DERS").

Share My Data

As required by the Commission,[142] the Company implemented the GBC protocol for sharing interval usage data with DER providers, announced its Share My Data Platform in December 2017, and then expanded the data elements available via Share My Data through continuous enhancements since 2018. Share My Data allows customers to authorize registered third parties to access their energy and account data through an automated process in machine-readable format. As of June 2023, the datasets available include:

- Account number
- Meter number
- Service address
- Energy or net energy usage data (kWh, net kWh, Ccf)
- Reactive power (kVAR)
- Service classification
- Installed capacity ("ICAP tag")
- Total electric and gas bill costs
- Billing history
- Interval usage timestamp
- Reading type (actual versus estimate)
- Subscription ID

Third parties can access 15-minute interval data for electric residential customers with smart meters and 5-minute interval data for electric commercial customers with smart meters.[143] Share My Data provides third parties with up to 24 months of electric usage data in near-real time, defined as 45-60 minutes after an interval ends.

The Share My Data onboarding process includes completing an online registration form, Data Security Agreement ("DSA"), and self-attestation, as well as completing technical onboarding on the system. After completing the onboarding, the third party is listed as a DER provider option in the Share My Data page on My Account and is ready to be authorized by a customer to receive their data. Part of the authorization process includes customers providing explicit consent, pertaining to the release of their data, under the established privacy rules. As of June 1, 2023, 35 third

[141] Case 15-M-0180, *In the Matter of Regulation and Oversight of Distributed Energy Resource Providers and Products* ("DER Oversight Proceeding"), Order Establishing Oversight Framework and Uniform Business Practices for Distributed Energy Resource Suppliers ("UBP-DERS Order") (issued October 19, 2017), p. 28.
[142] Cases 15-E-0050, et al., Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service ("Con Edison 2015 Electric Rate Case"), Order Approving Advanced Metering Infrastructure Business Plan Subject to Conditions ("AMI Order") (issued March 17, 2016).
[143] Customers with legacy electric interval meters are also able to share their 15-minute interval data using GBC.

parties are live on the Share My Data Platform, 35 are in the onboarding queue, and nine are actively working on completion of technical onboarding.

Third Party Access to My Account

Since 2018, the Company has learned from stakeholders that Share My Data and EDI both involve a level of technical sophistication that may not be feasible or necessary for some third parties to provide services to their customers. During this same time period, the Company also identified new customer data use cases for third parties that provide bill monitoring and payment services to utility customers. In April 2021, Con Edison added a third-party export enhancement, providing a list of all accounts associated with their third party profile. As of June 1, 2023, the Company has 353 third parties registered with active customer authorizations on the Third Party My Account Platform. Con Edison will continue to provide enhancements in line with stakeholder feedback.

Aggregated Customer Data

Aggregated customer data is available by whole building, municipality, and zip code, subject to the Commission's privacy standards for aggregated data, discussed below. To date, the primary use cases for aggregated customer data in Con Edison's service territory are whole-building benchmarking, including compliance with LL84 and 133 requirements in New York City, CCA Program development data, community planning, and GHG reporting at the municipal level. Each year, Con Edison provides New York City's largest building owners (i.e., larger than 25,000 square feet) and their authorized agents with aggregated building usage for purposes of complying with the city's benchmarking laws.

Utility Energy Registry ("UER")

The UER is an online platform developed by NYSERDA that provides streamlined public access, subject to privacy standards, to aggregated monthly customer data for electricity and natural gas, segmented by residential, small commercial, and other by municipality, zip code (for New York City), or county (depending on location). Third parties can leverage UER data in combination with system data to develop and better target innovative products and services. On a semi-annual basis, Con Edison continues to supply the UER with four years of monthly data, available at the UER website.[144]

Energy Efficiency Benchmarking ("EEB")

Under New York City's LL84, owners of large buildings are required to annually measure their energy and water consumption as part of the benchmarking process designed to assist building owners with EE planning. In response to LL 84, Con Edison created its Portal for NYC Benchmarking, which is a state-of-the- art solution that supports the automatic uploading of whole building aggregated energy consumption data to the U.S. EPA's ENERGY STAR Portfolio Manager® ("ESPM"). For the 2023 Benchmarking Season, the Company implemented a host of features and enhancements to the EEB Portal including:

- Overall data quality improvements and performance enhancements to existing Benchmarking Portal
- Meter read cycle (billing trip) to monthly calendar conversion to eliminate overlaps in data
- Automation of detection and estimate for unbilled consumption records and gaps

Privacy Standards and Protocols for Sharing Customer Data

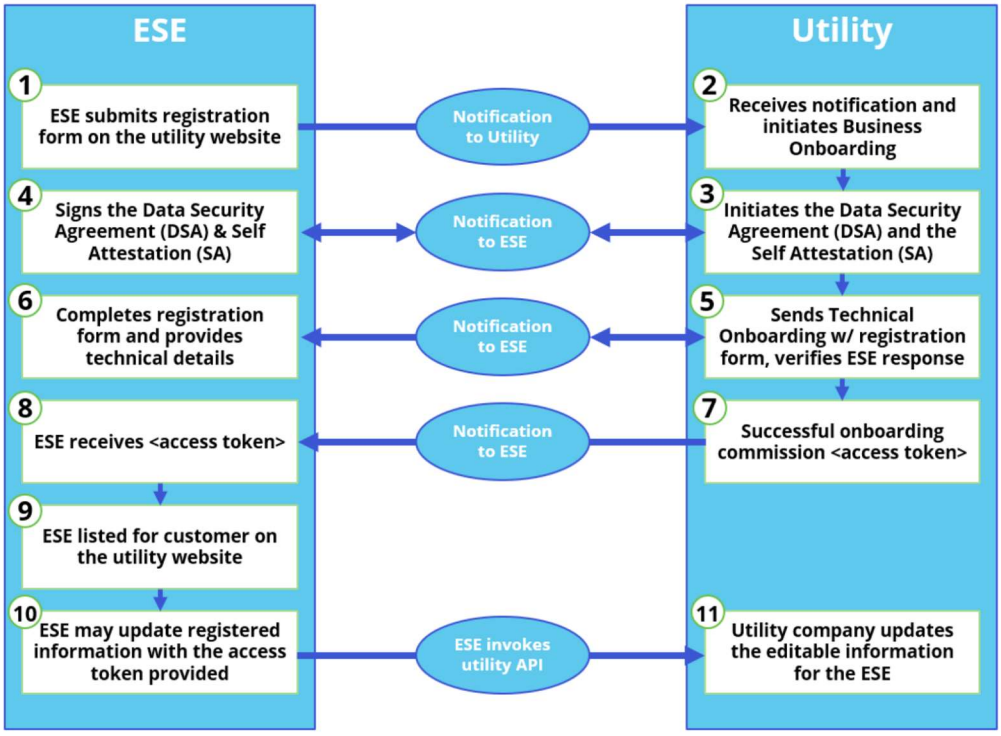
Con Edison considers the protection of customer information, including personally identifiable information ("PII") and confidential customer usage and account data, an important and serious responsibility. For customer-specific data, the

[144] Utility Energy Registry – Supporting Sustainable Communities landing page: https://utilityregistry.org/app/#/.

Company does not share information without customer consent to third parties except where required by Commission order or as described in the Company's privacy policy.

The Joint Utilities' GBC User Agreement and Onboarding Process provides a guide for Energy Service Entities ("ESE") to establish the connections and authorizations necessary for receiving Customer Data.[145] In other words, the Company protects data through an authorization and data security attestation process before establishing the technical interface to exchange data, described in Figure 16, below. These measures will be met or surpassed with the implementation of the DRC.

Figure 16: GBC Initial Connection Setup



For access to customer-specific data via Share My Data or EDI, the Company requires parties to execute a DSA and complete a technical onboarding and testing process prior to receiving customer data. The DSA includes a self-attestation form that is designed to expeditiously identify any material gaps in a third party's cybersecurity controls. The most recent Commission-approved DSAs were filed by the Joint Utilities in Case 18-M-0376 for generalized ESEs on January 8, 2020 and on July 10, 2020 specific to the New York State Office of General Services ("OGS").[146] A slightly

[145] The link for an ESE to register with Con Edison can be found here: https://www.coned.com/en/accounts-billing/share-energy-usage-data/become-a-third-party/registration-form.

[146] Cases 18-M-0376, *et al*., *Proceeding on Motion of the Commission Regarding Cyber Security Protocols and Protections in the Energy Market Place* (filed January 8, 2020). The form is also available on the Company's website at: https://www.coned.com/-/media/files/coned/documents/business-partners/business-opportunities/business-energy-pro/data-security-agreement-and-self-attestation.pdf.

different variation of the DSA is also used in conjunction with CCA data requests to protect customer-specific data, as required by the Commission.[147] [148] [149]

The Company continues to collaborate with the Joint Utilities, stakeholders, and DPS Staff to strike a balance between advancing the State's clean energy objectives and protecting customer privacy and data security, using actual data user needs and requests to inform proposed privacy standards. The Company has been leveraging best practices and expertise for data privacy from other industries, such as banking, and continues to engage in robust discussions centered on these challenges. As Con Edison and the Joint Utilities continue to make more customer data available, the Company shares the Commission's interest and long-standing policy of protecting the confidentiality of customer information and carefully evaluating disclosure exceptions on a case-by-case basis.[150] The protection of customer information, including (but not limited to) energy usage data, account numbers, assistance program participation, and PII, is part of Con Edison's core responsibilities and commitment to its customers.

Additionally, Con Edison gives its customers choices in how their information is used and disclosed to third parties, as outlined in the Con Edison Privacy Statement.[151] Specifically, customers may unsubscribe from the list of customer information that the Company shares with third parties, unsubscribe directly from any emails sent to them by other third parties, or call the Company at 718-802-6079 to unsubscribe.

Data Privacy Standards for Aggregated Data

On April 20, 2018, the Commission adopted the Joint Utilities' proposed 4/50 privacy standard for whole building data aggregations[152] and directed the utilities to file proposed uniform terms and conditions ("T&C") for building data. A 4/50 standard requires that a data set must include at least four customers, with no one customer accounting for more than 50 percent of the total consumption. The Joint Utilities filed proposed T&C on June 19, 2018, [153] which the Commission approved with modifications on January 2, 2020. [154] Con Edison has implemented these T&C as part of its building benchmarking program. In the DAF order, the Commission establishes a statewide aggregated data set privacy screen of 4/50 to be applied generally to all aggregated data sets reporting monthly or annual energy usage totals. This 4/50 privacy screen will replace all existing Commission approved privacy screens.[155] The 4/50 screen will serve as the starting point from which use case specific screens may be developed.

[147] Cases 14-M-0224, et al., *Proceeding on Motion of the Commission to Enable Community Choice Aggregation Programs*, Order Approving Community Choice Aggregation and Utility Data Security Agreement with Modifications (issued October 19, 2017).
[148] Case 20-M-0082, *Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data*, Joint Utility Petition to Modify Self Attestation (filed May 3, 2022): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7EB0B8C8-9DA2-4004-A5BC-095142AE88C2}.
[149] The Joint Utilities have a pending request with the Commission to update the DSA.
[150] Cases 07-M-0548 *et al*., *Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio,* Order on Rehearing Granting Petition for Rehearing (issued December 3, 2010), pp. 3-5, 17-21.
[151] Con Edison Privacy Policy website: https://www.coned.com/en/conedison-privacy-statement.
[152] DSIP Proceeding, Order Adopting Whole Building Energy Data Aggregation Standard (issued April 20, 2018).
[153] DSIP Proceeding, Joint Utility Aggregated Whole Building Data Terms and Conditions (filed June 19, 2018).
[154] DSIP Proceeding, Whole Building T&C Approval Letter (issued January 2, 2020).
[155] In previous Orders, the Commission had approved 15/15 and 6/40 privacy screens, which the 4/50 screen now replaces.

Distribution System Data

Con Edison currently provides extensive system data as part of its hosting capacity maps and the Joint Utilities' system data portal. Interested parties can locate the hosting capacity maps through multiple channels, including Company's hosting capacity website,[156] the Joint Utilities' website,[157] and internet searches. Con Edison's DSP website[158] is the entry point for the Company's hosting capacity maps, which allows users to access relevant system data by location.

The hosting capacity maps provide substation, feeder, and nodal level data requested by stakeholders, including substation name, queued and connected DG, substation peak load, NYISO load zone, and 8,760 load profiles. This data provides greater transparency into locations on the distribution system where DER integration may have higher value relative to other locations, greater insight into areas with potentially lower interconnection costs, and greater visibility into system characteristics and needs, which fosters market development**.** A detailed description of hosting capacity map enhancements can be found in **Section 2.9**.

Third parties can also access system data from a central portal maintained by the Joint Utilities. The central portal includes company-specific links to an expanded range of useful information, including DSIPs, Capital Investment Plans ("CIP"), planned resiliency and reliability projects, reliability statistics, and hosting capacity maps.

Con Edison has engaged stakeholders to understand their current and future needs regarding access to system data. Based on feedback, stakeholders are generally satisfied with the level of system data available as it relates to their current needs, and that the most incremental value in making enhancements lies in further refining data visualization, formats, and accessibility.

Future Implementation and Planning

Summary of Future Actions

- Collaborate with NYSERDA through the IEDR Advisory Committee and Utility Coordination Group ("UCG") to develop MVP use cases.
- Continue to iterate through IEDR enhancements in support of Phase 2 use case implementation.
- Consider additional Share My Data datasets as need arises based on stakeholder feedback.
- Continue to develop the Hosting Capacity Roadmap and prioritize use cases based on stakeholder feedback.
- Continue to develop and implement EEB Portal enhancements for the 2024 Season and beyond, including work that will leverage AMI data to provide hourly aggregated consumption details.
- Engage stakeholders, in collaboration with the Joint Utilities and the Information Sharing Working Group ("ISWG") to continue expansion of the statewide data sharing best practices.

The Company will continue to enhance its data-sharing capabilities based on stakeholder feedback while complying with approved customer data protections and actively participating in customer data-related proceedings. Con Edison will continue to engage in the various IEDR Working Groups (e.g., ISWG, UCG, Customer Consent Working Group ("CCWG") ITWG, and, LWG) which focus on updates to online portals and refining and/or expanding system data use cases to better meet stakeholder needs. As the centralized data resource, the IEDR use cases will be the source of most near-

[156] Note 39, *supra*.
[157] Note 40, *supra*.
[158] Con Edison Distributed System Platform website: https://www.coned.com/en/our-energy-future/our-energy-vision/distribution-system-platform.

term future actions. Since MVP use cases will contain non-public data, the deployment of this development work is contingent upon several critical path tasks, including implementing data sharing agreements between the various parties and developing data sharing tools and processes. Con Edison's support for the IEDR will focus on the IPV and MVP use cases described in greater detail in Table 15 and Table 16 below.

Table 15: Initial Public Version ("IPV") Use Cases[159]

Launch	Use Case	Description
IPV Q1 2023	Consolidated Hosting Capacity Maps	This use case supports DER developers, DER owners and/or utilities to view all hosting capacity maps for the entire State in one map view with consistent data, so that users can site new DERs and monitor the state of DER development in New York accurately. Foundational functionality will be implemented in the IPV, with enhancements to hosting capacity maps expected to be developed in future releases.
IPV Q1 2023	Large Installed DERs	This use case supports ESE and/or government staff members who want to view all installed DERs that utilities have data on (e.g., over 300kw), so they can site new DERs or monitor the state of DER development in New York. This use case also provides access to the necessary information pertaining to installed DERs, including attributes, location, and status in a consistent format across the entire utility service territories.
IPV Q1 2023	Large Planned DERs (Interconnection Queue)	This use case supports ESE and/or government staff members who want to view and monitor all planned DERs that utilities have data on (e.g., over 300kw), so they can site new DERs or monitor the state of DER development in New York. This use case also provides access to the necessary information that pertains to large planned DERs including attributes, location, and status in a consistent format across the entire utility service territories.

Table 16: Minimum Viable Product ("MVP") Use Cases[160]

Launch	Use Case	Description
MVP Q2-Q4 2023	DER Siting – Environmental, Community, Terrain, Land, and Property Assessment	This use case will support local governments and community solar developers who want to accelerate the process for identifying, selecting, and negotiating site agreements for community solar projects, by providing access to environmental, community, and property data (in addition to electrical infrastructure information, which was foundationally covered in the IEDR IPV release). This will allow users to reliably identify feasible sites for solar development, to deploy available capital more quickly and increase the amount of clean energy available to New York State electricity customers.
MVP Q2-Q4 2023	EIAT (Electronic Infrastructure Assessment Tool) Hosting Capacity & DER Map Enhancements	This use case will support DER developers, DER owners and utilities to better understand and accelerate the interconnection approval process for DER systems, by providing a clearer understanding and evaluation of the process of siting the location of a DER installation, so that DER projects can deliver clean energy to customers as soon as possible. Features that will enable the function of this use case include enhancing existing hosting capacity maps through standardization, interconnection approval process duration, interconnection cost information, utility upgrade project information, and corresponding forecast of hosting capacity updates.

[159] New York State Integrated Energy Data Resource Stakeholder Use Cases: https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program/Use-Case-Development.
[160] *Ibid*.

MVP Q2-Q4 2023	Efficient and Effective Access to Existing Customer Billing Data	This use case will grant access electronically for a list of properties at the time of energy manager and data services contract signing, with no additional action required on behalf of the customer for the data services provider to access data for those properties at a later point (within the authorized timeframe). Currently, separate actions are required for each customer account at the time of the authorization request. Ideally, customer consent can be granted both in advance and at the time of the request and via mobile phone. This use case would also help improve the timeliness of bill payment, reduce late fees, and verify customer savings.
MVP Q2-Q4 2023	Find and Filter Rate Options Across New York State IOU Utilities	This use case will allow ESE or government staff members to view a list of rates/tariffs across New York State utilities filterable by key criteria (e.g., rate name, rate type, location, etc.), to quickly navigate to pertinent rate information. This use case will also enable access to rate and tariffs information in a consistent and machine-readable format; removing the need to manually review individual PDFs over time or visit individual utility websites to see what the available rates are. Users will be able to export the list in order to use it for analysis and integration with their own analysis tools.
MVP Q2-Q4 2023	Access to Basic Rate Data and Tariff Book for Individual Rate	This use case will allow users to see all information about a single rate in one place; enabling those estimating energy customer bills to access relevant data more easily and precisely than they currently can. Specific features of this use case include making rate parameters that change slowly (rate periods, holidays, seasons, minimum and other fixed charges, and baseline allowances aka tiered block rates) available in structured format, and facilitating easier navigation to the section of the tariff where parameters for a given rate can be found (which includes easier navigation to both the most recent version of the tariff book itself and historical versions of the tariff).

In addition to the Company's IEDR efforts, work is underway to develop a full system redesign for Con Edison's existing EEB Portal. For the 2024 Season and beyond, the Company intends to leverage AMI data to provide hourly aggregated consumption details in support of LL97 and address other stakeholder requests.

Risks and Mitigation

The implementation of any future use cases for the IEDR or other data sharing protocols and mechanisms could be affected by system integration issues, cybersecurity risks, and changing priorities. Transmitting and storing protected customer data in the IEDR presents a data loss risk. Con Edison, working with the Joint Utilities, petitioned the Commission to clarify requirements for sharing protected data sets. The Company is closely monitoring implementation of the IEDR use cases and will assist in addressing potential issues where there are risks to customer data loss.

With the increase in data sharing, there is also the risk of security breaches, including loss of customer data. Loss of customer data poses both legal and reputational risks for the Company and IEDR Administrators. As of April 2021, the Commission issued the DAF Order to serve as a single source for statewide data access requirements.[161] Con Edison follows current cybersecurity practices to protect individual customer data, which require express customer consent for data to be released to parties other than utility contractors or vendors or by law or Commission order. The Joint Utilities have also developed a common Cyber and Privacy Framework to manage cybersecurity risks that apply to the expanded data sharing in the evolving DSP environment.[162] The framework focuses on people, processes, and technology as being the foundation for comprehensive cybersecurity and privacy governance program.

[161] Note 134, *supra*, p. 2.
[162] Note 18, *supra*, pp. 148-160.

Additionally, the Company manages data security risks by requiring non-contracting parties using or accessing utility systems to sign the DSA, an agreement between the utility and third party that governs the exchange of customer data. The DSA T&C include, but are not limited to, a statement that the third party has received the customer's consent to access the data and the notice requirements in the event of a data security incident. The DSA also includes a data self-attestation, whereby third parties attest to meeting the data security procedures and requirements listed.

Stakeholder Interface

Con Edison will continue to engage with stakeholders through the Joint Utilities' ISWG to provide updates on customer data sharing mechanisms, implementation updates, and gather their feedback on processes or new data requests. In addition, the Company, as part of the ISWG, remains open to have one-on-one stakeholder meetings to explore any additional use cases that are relevant to advancing DER market development.

The Company participates in the monthly Joint Utilities' IEDR Technical Working Group meetings which provide a forum to share approaches to data architecture and data transfer and discuss open questions to guide the development of the IEDR design and implementation. In addition, Con Edison participates in Joint Utilities' LWG and CCWG meetings to create a unified approach for legal agreement(s) between the utilities and the IEDR platform vendors, as well as the data transfer processes and considerations related to customer privacy and security. The Company also chairs the UCG, the IEDR Advisory Committee, and actively contributes to stakeholder meetings, workshops, webinars, technical conferences, and working groups associated with IEDR efforts.

Additional Detail

This section responds to the questions specific to data sharing.

1) **Provide a functional overview of the planned IEDR;**

On February 11, 2021, the Commission issued an Order approving the design and implementation of a statewide IEDR platform to centralize data access, including utility data (customer and system data) and other energy-related data (i.e., EV registration, building characteristics, DER operations) in support of New York's clean energy goals. Phase 1 will enable the development of at least five priority data use cases over 24-30 months (Q4 2023), while Phase 2 will enable 40+ additional data use cases over 30-36 months (2026). The New York State Energy Research and Development Authority was identified as the program sponsor for this effort and formed the Steering Committee with DPS Staff. The Order approved Phase 1 budget of $67.5 million for the utilities and NYSERDA, and described a program schedule, governance structure, and reporting requirements.

2) **Provide an overview of NYSERDA's IEDR implementation program, including information pertaining to stakeholder engagement;**

On May 24, 2021, NYSERDA, as the IEDR Program Sponsor, issued a notice inviting stakeholders to provide comments identifying, characterizing, and prioritizing a preliminary set of potential use cases for Phase 1 implementation of the IEDR. The Joint Utilities and other stakeholders submitted IEDR Use Case comments on July 23, 2021. The Joint Utilities proposed use cases that would benefit stakeholders across the State from their perspective, as noted by NYSERDA's instructions, but emphasized that the IEDR should prioritize use cases from developers and other stakeholders that maximize societal value. The New York State Energy Research and Development Authority guided the prioritization and selection of the Use Cases to move forward with Phase 1 of the IEDR design and implementation.

The IEDR Program Team selected and released the following use cases for the IPV in Q1-2023:

- Large Installed DERs
- Large Planned DERs (Interconnection Queue)
- Consolidated Hosting Capacity Maps

The IEDR Program Team selected the following use cases for the IEDR MVP to be released during Q4-2023:

- DER Siting – Environmental, Community, Terrain, Land, and Property Assessment
- EIAT Hosting Capacity and DER Map Enhancements
- Efficient and Effective Access to Existing Customer Billing Data
- Find and Filter Rate Options Across New York State Investor-Owned Utilities ("IOU")
- Access to Basic Rate Data and Tariff Book for Individual Rate

In Q3 2022, NYSERDA announced the selection of E Source Companies, LLC (E Source)[163] to lead the Development Team for the IEDR. The Development Team, led by E Source, includes UtilityAPI, Flux Tailor, TRC Companies, and HumanLogic. Together, the team is responsible for designing, building, and operating the IEDR platform to accomplish the policy goals and program outcomes as described in the Commission's IEDR Order in a cost efficient and expeditious manner. The Development Team leverages E Source's OneInform and UtilityAPI's GBC offerings to enable the data access, governance, querying, analysis, and consent processes that are required to deliver the full benefit of stakeholder submitted use cases.

3) Provide the web link to NYSERDA's IEDR home page along with a summary of the information provided therein;

A list of NYSERDA's IEDR homepage resources are located below in **Table 17.**

Table 17: NSYSERDA IEDR Home Page Resources

Type of Information	Link
IEDR Program - NYSERDA	https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program
Milestone Schedule	https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program/Program-Milestones
Use Case Development	https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program/Use-Case-Development
Meetings	https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program/Get-Involved
Program Participants	https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program/About-IEDR/Program-Participants
IEDR Resources	https://www.nyserda.ny.gov/All-Programs/Integrated-Energy-Data-Resource-Program/IEDR-Resources

[163] Con Edison was not involved in the bidding and selection process for the IEDR Development Team.

4) **Describe the utility's role in supporting IEDR design, implementation, and operation;**

Initially, Con Edison filled out the IEDR Data Survey and submitted results at the end of October 2021. To facilitate ongoing coordination, the Company collaborated with NYSERDA and DPS Staff by attending the UCG monthly meetings and additional workshops. Topics discussed during UCG meetings include:

- Utility to IEDR data transfer methodology
- Customer consent considerations and the impact of policy and statutory requirements on the IEDR Platform, including but not limited to indemnity and liability issues, state legislation indicating opt-in approaches may be required, federal legislation on data sharing requirements, and other regulatory requirements governing privacy policies and data sharing responsibilities
- Data availability of a small subset of requested data elements
- Consistency of data element nomenclature across all utilities
- Sensitivity of certain requested data elements

On February 28, 2022, each utility submitted responses to the Notice of Utility Data Requirements ("UDR") issued by NYSERDA on February 7, 2022. The UDR requested an approach to deliver preliminary data elements to the IEDR by May 2022. While the Company is fully supportive of sharing useful information to achieve New York's clean energy goals, customer privacy and cybersecurity guides the Company's decision making. As such, Con Edison and the Joint Utilities coordinated additional discussions with DPS Staff and NYSERDA to put in place the necessary mechanisms consistent with New York and other privacy laws and regulations.

The Company and Joint Utilities collectively developed internal processes to collect and process the data, and ultimately transfer it to a secure, central location in accordance with appropriate legal and privacy considerations. The Company continues to coordinate discussions with DPS Staff and NYSERDA to protect customer privacy and mitigate cybersecurity concerns. On December 1, 2022, Con Edison, in concert with the Joint Utilities, petitioned for clarification seeking Commission direction regarding the direct sharing of protected customer data with the IEDR administrator.

Con Edison and the Joint Utilities submitted their first round of test data on June 17, 2022, to help the IEDR Program Team build out the platform. The Joint Utilities sent a second round of IPV Test Data for hosting capacity maps and DER use cases in November/December 2022. This assisted the IEDR Development Team in understanding the structure and format of utility data, which aided implementation of the IPV use cases and overall development of the IEDR Platform that launched on March 31, 2023.

5) **Describe the utility's progress, plans, and investments for generating and delivering its system and customer data to the IEDR;**

The Company helped develop and enhance the architecture designed for IPV use case data delivery, which was informed by working closely with the IEDR Development Team to refine the delivery method and formatting. Several enhancements have been added, with development performed by both employees and additional contracted labor, which include the ability for the platform to not only support ingestion and manipulation of data but also to output data on a schedule and in a greater variety of file formats.

The data governance initiative described in the Company's IEDR Utility Quarterly Reports[164] produced helpful artifacts, such as an IEDR data dictionary, which not only continues to aid the project team in its obligations but also serves to

[164] Data Proceeding, IEDR Utility Quarterly Report Q4 2022 (January 30, 2023).

inform the future implementation of Con Edison's Data Governance Program. The data governance office will continue to work alongside the IEDR team as both initiatives develop to align on data cataloging and data quality standards.

The Company anticipates active engagement with stakeholders throughout the remainder of 2023 as MVP use cases are being refined and implemented. The Company will continue to work with the IEDR Development Team to refine and further develop data transfer processes and protocols. Con Edison also continues to coordinate with the Joint Utilities to standardize and benchmark as needed.

6) **Identify and characterize each type of data to be delivered to the IEDR;**

The customer data Con Edison has and will deliver to the IEDR, pending data sharing agreements, includes legacy interval, AMI, and/or register-read meters, customer account details, and billing data. There are differences in the type and granularity of the customer load and supply data the Company acquires based on customer type and metering configuration. In some cases – generally C&I customers – the Company will also acquire additional data, such as demand (kW) and reactive power (VAR) data, as required for billing under the applicable tariff.

The IPV use cases harnessed hosting capacity and planned and installed DER system data. Future use case iteration using system data delivered to the IEDR, which is also available on the Company's data sharing portal, could include:

- Planned resiliency and reliability projects
- Reliability statistics
- Hosting capacity
- Beneficial locations
- Load forecasts
- Historical load data
- NWS opportunities
- Queued and installed DG
- SIR pre-application information

7) **Describe the resource(s) and method(s) used to deliver each type of data to the IEDR;**

Con Edison works with the IEDR Development Team to refine data exchange specifications for each dataset and then coordinates with internal SMEs to source and transform the data from internal systems. The Company also accounts for privacy and security concerns associated with sharing each data element from specified datasets and the incremental risk incurred from integrating additional data into a common repository.

8) **Describe how and when each type of data provided to the IEDR will begin, increase, and improve as IEDR implementation progresses; and,**

Phase 1 IEDR implementation is comprised of two sub-phases: the IPV and the MVP. Use cases inform the IEDR through subsequent progression and refine the necessary data and system functionality required for statewide adoption. The IPV focused on three use cases that appeal to key users of the IEDR, are critical for subsequent use cases, and can be done quickly, having an immediate impact. The IPV use cases employ publicly accessible energy system data used by DER providers, developers and aggregators, and government agencies. The IPV was launched on March 31, 2023. Minimum Viable Product use cases will require non-public data and the necessary data sharing agreements in place. Minimum Viable Product use cases will contain sufficient features and updates to maintain program momentum for comprehensive implementation. In other words, successive completion of use cases will further enhance the development of IEDR functionality and data transferred across the platform. The MVP use cases are slated to launch during Q4-2023.

9) **Identify and characterize any existing and future utility efforts to share system and customer data with customers and third parties through means that are separate from the IEDR.**

The Company continues to employ a suite of customer data sharing technologies, securely sharing data with third parties and DER providers including Share My Data, EDI, third party access to My Account, and the EEB Portal. In preparation for the 2024 Season, Con Edison is planning a full system redesign for the EEB Portal that will employ AMI data to provide aggregated building consumption details in support of LL97, with the goal of making the platform scalable for future benchmarking and data sharing requirements. Additional details on platform technologies are discussed in greater detail above.

For distribution system data, the Company published new hosting capacity map elements on April 1, 2023, including sub-feeder level data for the storage hosting capacity map, nodal constraints (criteria violations) on PV solar and hosting capacity maps, and a new field to reflect DG connected at the feeder and substation level since the last hosting capacity refresh. Additional details on hosting capacity maps and functionality are discussed in Section 2.9.

2.9. HOSTING CAPACITY

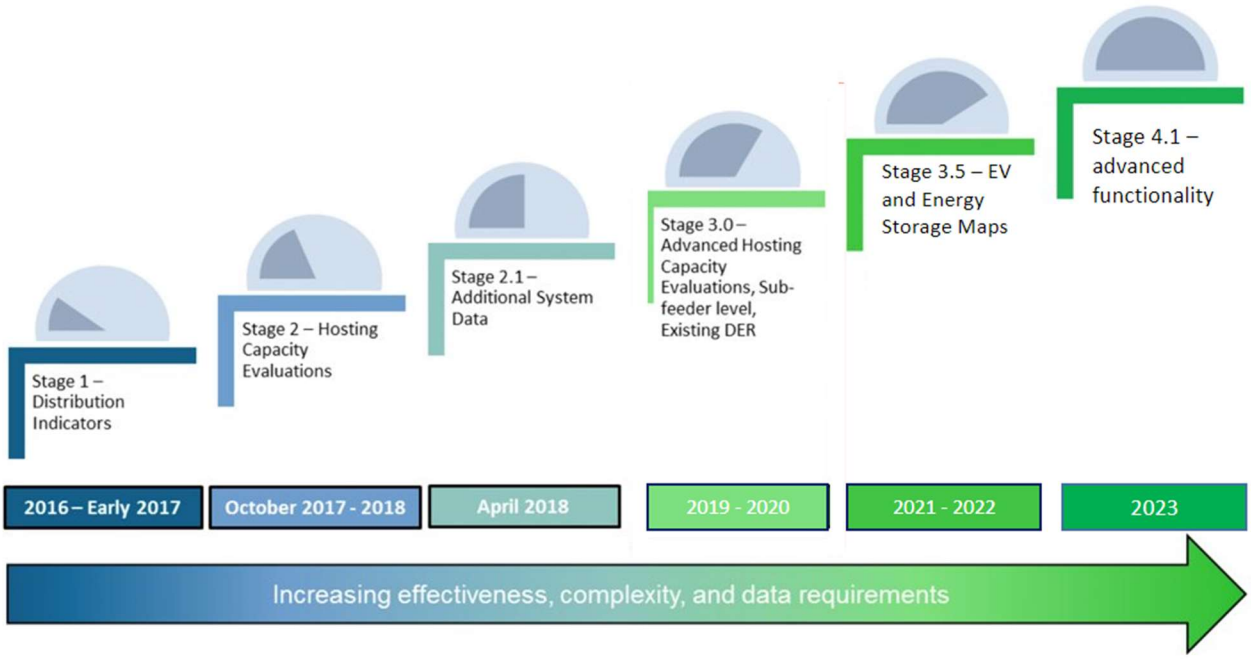
Context and Background

Con Edison continues to advance its hosting capacity capabilities and make additional system data available to third parties. These actions support DER integration and DER market growth by guiding investments to areas of the grid where the costs of interconnection are likely to be the lowest, thus allowing prospective interconnection customers to make more informed business decisions prior to committing resources to an interconnection application.

Hosting capacity is defined as the amount of DER that can be accommodated without adversely impacting power quality or reliability under existing control configurations and without requiring infrastructure upgrades to the primary line voltage and/or secondary network system.[165] The Joint Utilities calculate each circuit's hosting capacity by evaluating the potential power system criteria violations as a result of interconnecting large PV solar systems to three-phase distribution lines.[166] The Joint Utilities selected this approach to deliver usable information in a timely manner to the DER developers most active in the State.

Figure 17 below shows the Joint Utilities' multi-phase approach for developing HCA capabilities, which is paced with the evolution of hosting capacity tools, models, and processes. With each stage comes increased granularity but also complexity.

Figure 17: Joint Utilities Hosting Capacity Roadmap



[165] EPRI, *Defining a Roadmap for Successful Implementation of a Hosting Capacity Method for New York State*, Report Number 3002008848 ("EPRI Roadmap"): http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002008848, (June 2016), p. 2.

[166] This refers to solar generation with an AC nameplate rating starting at and gradually increasing from 300 kW.

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Published Updates to the Hosting Capacity Maps including:
  - Stage 1 of the Storage Hosting Capacity data as part of the Stage 3.5 Hosting Capacity Roadmap, including feeder-level hosting capacity, downloadable feeder level summary data, existing DER, and sub-transmission lines available for interconnection.
  - Stage 2 of the Storage Hosting Capacity data including sub feeder level data.
  - Additional map updates including REST API data, criteria violations on PV and Storage maps, DG connected since last refresh, and Cost-Sharing 2.0 information.
  - EV Charging capacity map.
- Convened six stakeholder meetings since the 2020 DSIP to familiarize stakeholders with the release of the hosting capacity map updates and tools.
- Continued roadmap progression with definition of Stage 4.0 and plan for delivery.

The Company continues to add new functionalities to the hosting capacity platform with the goal of maximizing the value of the hosting capacity map for developers.

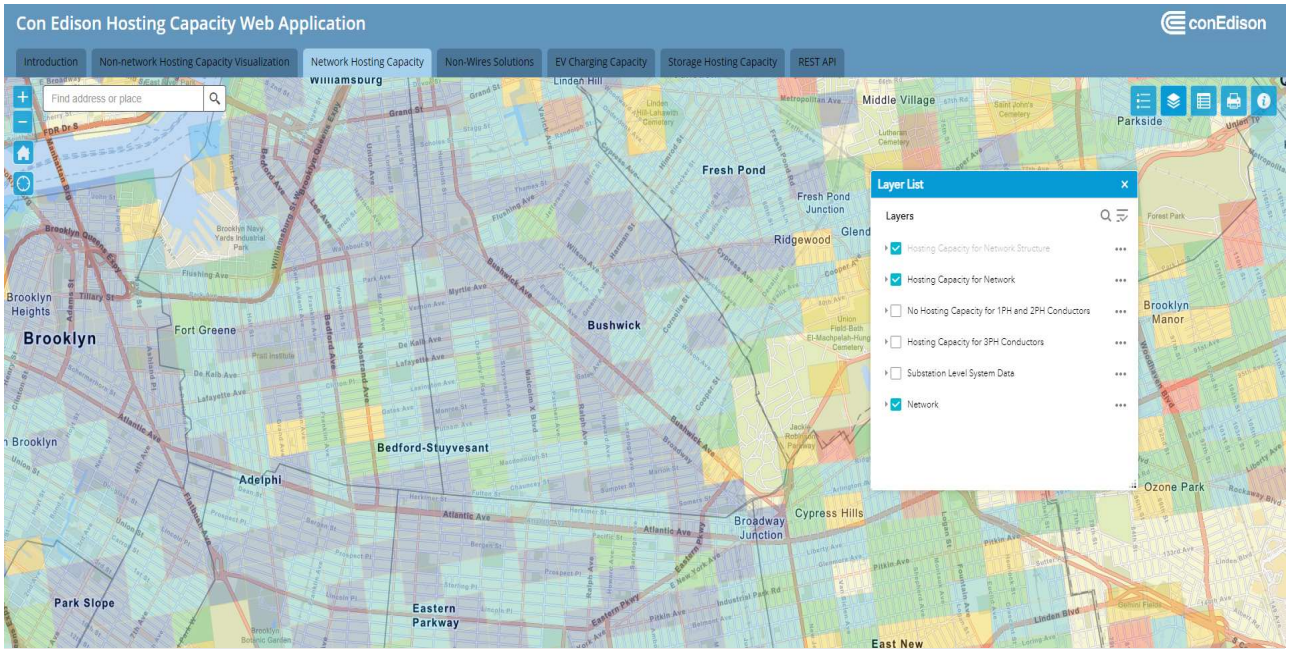
Con Edison Hosting Capacity Web Application Tabs

Stage 3.5 represents continued progress since issuing a static low-voltage network hosting capacity map for network and non-network distribution circuits in June 2016. Since that first map, the Company published a new hosting capacity map on October 1, 2017, which provided a visual representation using color coding standardized across the Joint Utilities of estimated available feeder-level hosting capacity for non-network circuits at 12 kV and above.[167] Con Edison published hosting capacity on 4 kV overhead circuits in December 2017 and the complete network and non-network hosting capacity map in June 2018. The network map is based on site-specific load flow studies and presents hosting capacity at the service box and secondary service level, making it the only hosting capacity map in the country for network systems.[168] Developers can narrow searches to available customer or project locations instead of receiving high-level distribution network values that may or may not accurately reflect the values observed at the true point of interconnection. The entry screen for the map contains tabs for non-network hosting capacity, network hosting capacity (selected), NWS, EV charging capacity, and storage hosting capacity, in addition to allowing users to select different layers to display additional data.

[167] Con Edison ArcGIS login: http://coned.maps.arcgis.com/apps/webappviewer/index.html?id=ce32722defd04152b16b594c36795490.

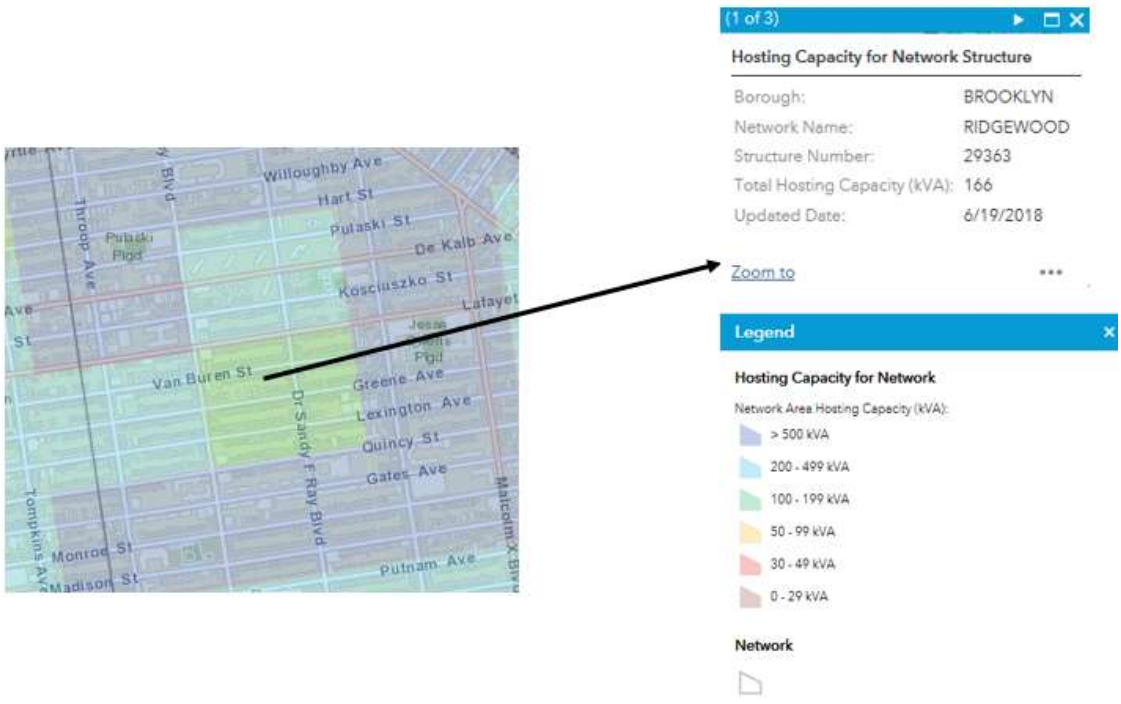
[168] The Stage 2 analysis was completed using the EPRI DRIVE tool. The DRIVE tool leverages existing circuit models in a utility's native distribution planning software to carry out a streamlined analysis of hosting capacity. Because EPRI's DRIVE tool was designed for analyzing radial (non-network) circuits and is not configured to provide hosting capacity in the Company's low-voltage mesh grid, the Company worked internally to modify the static network maps to present network hosting capacity values on the mesh network.

Figure 18: Network Hosting Capacity Map



The colored squares visible in Figure 18 above and Figure 19 below provide a view of the main and service ("M&S") plate. M&S plate calculations are based on the locational capacity of distribution transformers geographically located in that area. By clicking on the square, a user can access additional data at that level, including hosting capacity and available system data.

Figure 19: Network Hosting Capacity View at the M&S Plate Level

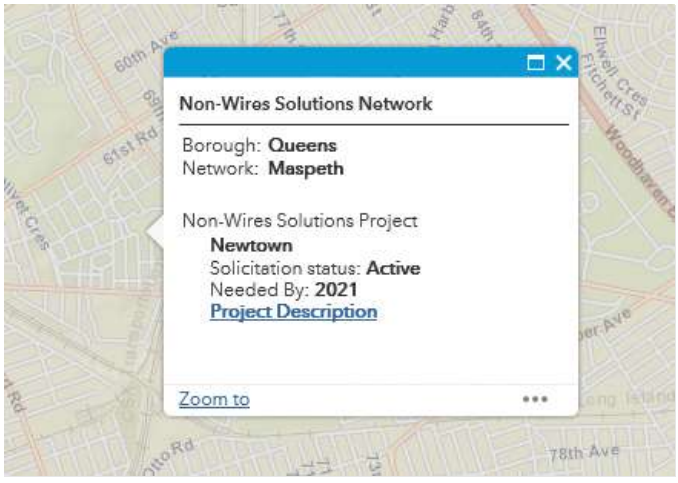


Users can further zoom in on the network area to view hosting capacity for individual structures, as shown in Figure 20.

Figure 20: Hosting Capacity for Individual Network Structures

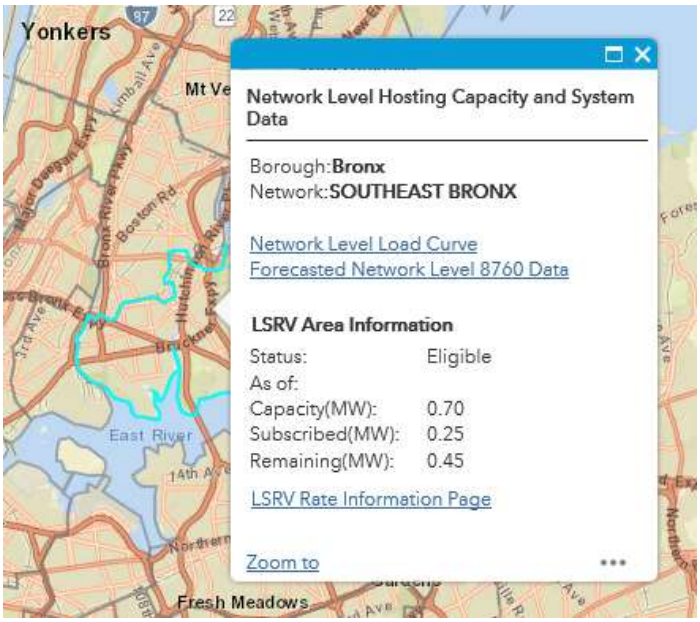
In addition to granular network and non-network hosting capacity, the platform displays areas targeted for NWS and areas with positive LSRV, providing a more comprehensive view of beneficial locations. LSRV information in the system data pop-up boxes includes eligibility status, remaining capacity, and a link to the rate information page on the Company's website. As shown in Figure 21 below, the NWS tab of the hosting capacity map displays an NWS-eligible area at the network level, the affected feeders, and the relevant system information, as well as a link to the project description.

Figure 21: NWS View



As shown in Figure 22 below, the Company added LSRV information to the system data pop-up boxes, including eligibility status and remaining capacity, as well as a link to the rate information page on the Company's website.

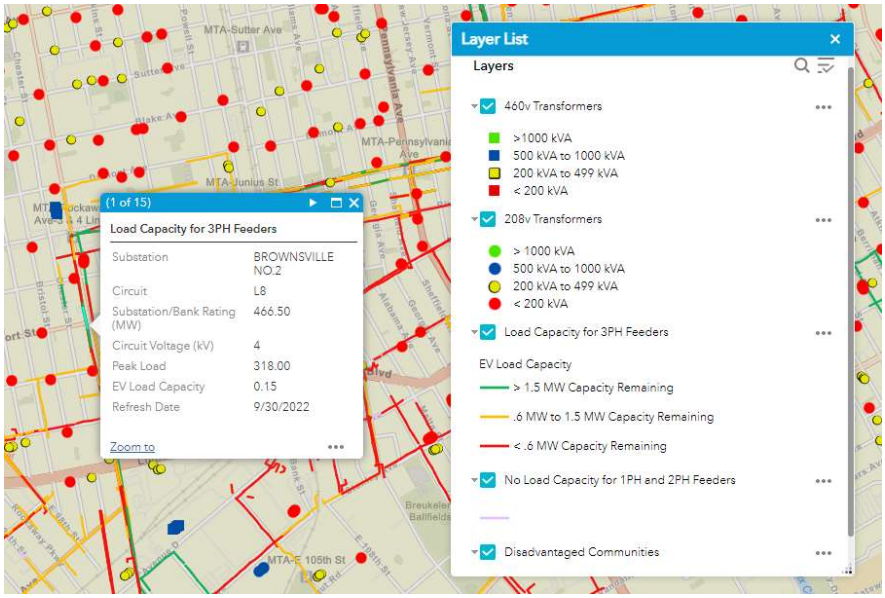
Figure 22: LSRV View



Providing this multi-faceted view allows developers to more readily see where there is higher potential value to be captured across the Con Edison distribution system, through supplemental LSRV value streams as part of the VDER tariff or NWS payment streams, and compare that to the hosting capacity of those areas for a more complete assessment of business opportunities.

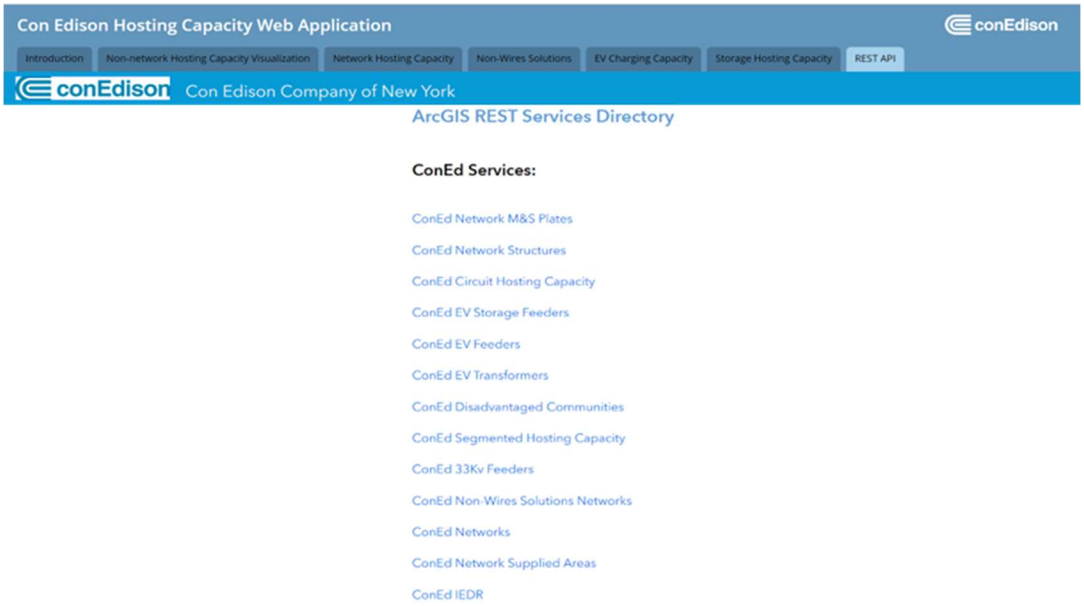
The EV charging capacity tab of the hosting capacity map, as shown in Figure 23 below, includes a robust layer list with optionality for 460v and 208v transformers, load capacity for three-phase feeders, no load capacity for one- and two-phase feeders, and a layer for DAC. The EV maps display an estimate of the remaining circuit and substation load capacity, to help indicate areas in the service territory with potentially higher interconnection costs for DCFC development.

Figure 23: EV Charging Capacity View



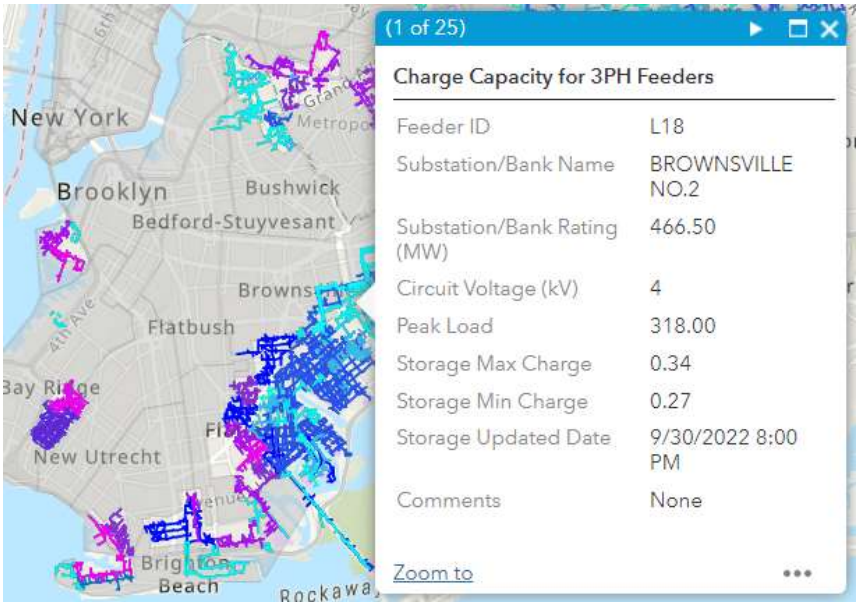
In addition, Con Edison provides the REST API tab, allowing third parties to overlay existing hosting capacity data with their own geographic information system ("GIS"), as shown in Figure 24 below. Under the Services Directory in the REST API tab, stakeholders can select the desired data and layers to utilize from the maps.

Figure 24: Con Edison REST API Tab View



The storage hosting capacity tab has separate displays for load and generation and is color-coded based on the minimum level of the maximum hosting capacity calculated for the feeder. The minimum level of the minimum hosting capacity calculated appears on the draw-down pop-up in Figure 25.

Figure 25: Storage Hosting Capacity View



In 2021, before the Storage Hosting Capacity Maps were launched, the JU held stakeholder sessions to better understand developer needs. Additional functionality suggested by stakeholders included:

- Showing the additional storage connected on a monthly basis consistent with how PV is presented
- Adding sub-transmission circuits that can host DG to the map
- Showing output consistent with the Cost-Sharing 2.0 Order[169]

After the JU published the first iteration of the Storage Hosting Capacity Maps, stakeholders requested that the maps utilize use cases that reflect developer business models. Currently, use cases for the storage capacity map are worst-case scenarios. To share use cases that better reflect developer business models, the Joint Utilities have invited stakeholders to share their business use cases with the ITWG. While these will not be interconnection use cases, the goal will focus on creating alignment on the approach to information between interconnection and the hosting capacity maps.

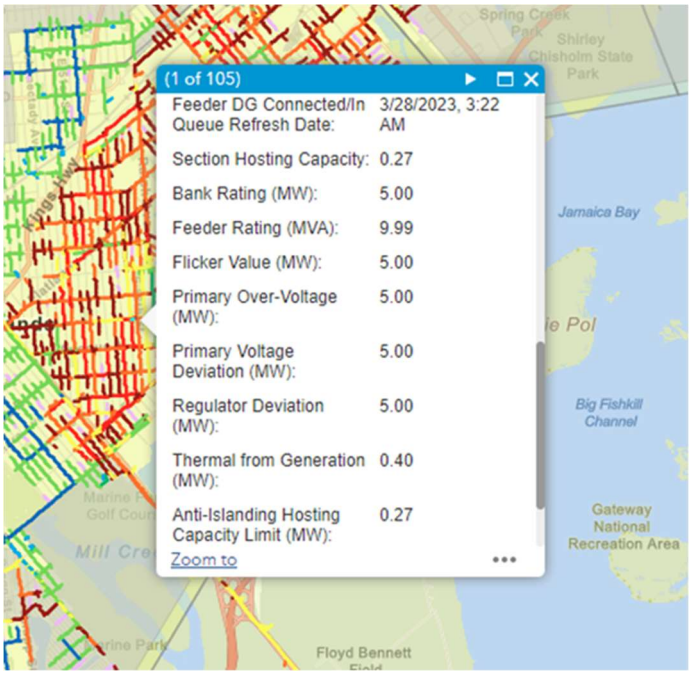
As part of Stage 3.5 of the Hosting Capacity Roadmap, Con Edison published Stage 1 of Storage Hosting Capacity Maps in spring 2022. This map displays the functionality of feeder-level hosting capacity (min/max), additional system data, downloadable feeder-level summary data, sub-transmission lines available for interconnection, and reflects existing DER in circuit load curves and allocations.

On April 1, 2023, Con Edison published new map elements including sub-feeder level data for the Storage Hosting Capacity Map, nodal constraints (criteria violations) on PV solar hosting capacity maps, and a new field to reflect DG connected at the feeder and substation level since the last hosting capacity refresh.

Nodal constraints on PV solar and storage hosting capacity maps, depicted in Figure 26 below, are displayed by color range for daytime minimum load and peak. As is consistent with the PV map, colors reflect the minimum value of hosting capacity. The nodal pop-up provides a more detailed breakdown of criteria violations as shown below.

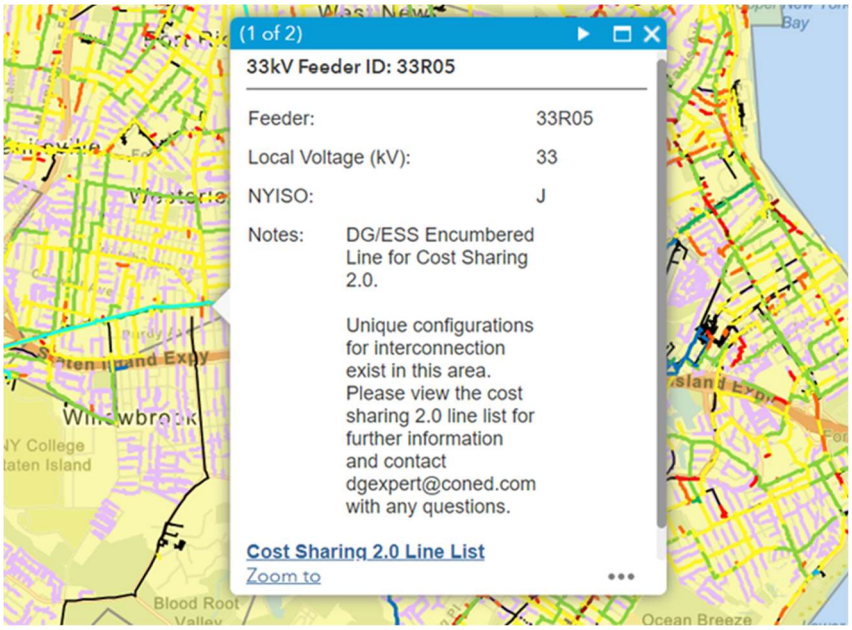
[169] Case 20-E-0543 and 19-E-0566, *Order Approving Cost-Sharing Mechanism and Making Other Findings*, (issued and effective (July 16, 2021): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={73FC964F-A7C2-45D0-BB06-8FB2720F9C5C}.

Figure 26: Criteria Violation Nodal View



Information on cost-sharing 2.0 projects is available for relevant feeders as shown in Figure 27 below.

Figure 27: Cost-Sharing 2.0 View



Future Implementation and Planning

Summary of Future Actions

- Refresh hosting capacity maps in October 2023 as part of the annual refresh.
- Conduct stakeholder engagement and training sessions.
- Incorporate feedback from stakeholder engagement meetings into decisions for further defining the details and assumptions used in Stage 3.5 and beyond.
- Continue to explore avenues to advance the Hosting Capacity Roadmap to enhance the value of the information provided.

The next milestone, scheduled for October 2023, is the annual refresh of the maps. The Company will continue to work toward advancing its datasets and enhancing granularity throughout the next stages of the Hosting Capacity Roadmap.

The Joint Utilities will evaluate options for forecasting hosting capacity that considers the accuracy of such an analysis given the uncertainty in the location, timing, and configuration of DER adoption forecasts, projected changes to individual customer loads, and any upgrades or changes to the utility system. The roadmap for forecasting hosting capacity must incorporate models of future utility system configurations, gross load forecasts, and DER forecasts. Each of these items has its own roadmap and consideration of scenario-based planning, probabilistic, and deterministic approaches. These concepts must be integrated to produce a forecast, and the appropriate level of granularity must be determined before the level of uncertainty rises significantly.

Additionally, Con Edison is committed to evolving hosting capacity to meet changing policy and evolving technologies. As the grid evolves, operating parameters change, and policy direction shifts, hosting capacity will also need to evolve into a more integrated planning tool that continues to take additional inputs into account. System constraints that may present challenges to interconnection, such as voltage exceedance, may be mitigated over time as smart inverters and grid edge controls provide greater operational flexibility. Similarly, over time, advancements in integrated planning may allow for a broader range of inputs to hosting capacity calculations, including DER in the queue that may address system constraints at a given location. As a result, what today appears as an area with limited hosting capacity could reflect these broader considerations and increase the available hosting capacity indicated on the map. In this scenario, it is the ability to modify inputs on a more dynamic basis that leads to improved information.

The Joint Utilities are actively coordinating with the EPRI and other utilities in North America on the Distribution Resource Integration and Value Estimation (“DRIVE”) tool roadmap in order to evaluate options for including aspects such as upstream constraints and operational flexibility in future Stage 3 and 4 releases and beyond.

Risks and Mitigation

The software and calculation tools used for HCA are evolving. The timeline for the development of tools necessary for more advanced analysis and their integration with utility systems could impact the timeline for future releases. Con Edison continues to engage with EPRI on refining its DRIVE tool in the continued development of the roadmap.

Stakeholder Interface

The Joint Utilities work with stakeholders to familiarize them with any updates to the hosting capacity maps and solicit input on desired features, and have held six stakeholder engagement sessions since the 2020 DSIP. The Joint Utilities will continue to engage stakeholders to further inform the continued expansion of the Hosting Capacity Roadmap and

deliver the highest value maps for users. The Joint Utilities typically hold between two and three stakeholder sessions annually, and plan to hold stakeholder engagement sessions corresponding with the release of each stage to provide an update to stakeholders on progress to date and solicit input on future stages.

Additional Detail

This section responds to the questions specific to hosting capacity.

1) **Describe the utility's current efforts to plan, implement, and manage projects related to hosting capacity. Information provided should include:**

   a. **a detailed description of each project, existing and planned, with an explanation of how the project fits into the utility's long-range hosting capacity plans;**

Con Edison has an internal hosting capacity project team that is responsible for translating the Joint Utilities' Hosting Capacity Roadmap into work streams and deliverables. The cross-functional team is made up of SMEs familiar with relevant policy goals and standards, distribution planning, and engineering, as well as the mapping and visualization platforms needed to externally present calculated data points. A description of the team's existing and planned projects is below.

Con Edison continues to iterate and refine hosting capacity processes that fall into two main groups – calculation methodology and geospatial visualization. Currently, efforts around calculation include progress toward automation and model/data refinement and cleanup. The Company is confident in our approach to calculation, and additional work on the methodology will include, but is not limited to, the incorporation of additional use cases, as well as evolving technologies that may require a different definition of what a "costly upgrade" may constitute, with the primary example being smart inverter technology. Con Edison's visualization team continues to improve the mapping databases and portal production processes, as these efforts are folded into the longer-term roadmap for GIS functionality.

<u>Stage 2.0 Radial Hosting Capacity</u>

Con Edison published a full streamlined HCA for overhead circuits operating at a voltage class greater than 12 kV in October 2017, followed by analysis for 4 kV circuits in December 2017.

In addition to traditional utility load flow modeling, the Company worked on the mapping and visualization platforms necessary to refine the data elements needed to present hosting capacity in a geospatial environment. This is an ongoing effort throughout future stages of HCA.

<u>Network Level Hosting Capacity</u>

Because 87 percent of load is served through underground low-voltage networks, the Company worked through 2017 and into 2018 to develop an approach around network-level hosting capacity calculation and the data visualization strategy that leveraged the established overhead color and data schemes to improve the customer experience.

Con Edison's network level map allows the user to navigate different sections of a network by hosting capacity color and view existing and queued DG values. Once users locate a larger geographic area of interest, they can navigate to the street level and observe values at the various points that would be available for interconnection. Users can also search by prospective project address to view these more detailed values. This network-level map was released in June 2018.

Stage 2.1 Hosting Capacity

Throughout the 2017 stakeholder engagement sessions for both hosting capacity and system data, developers requested values for queued and connected DG projects, total DG (i.e., the sum of queued and connected DG), historical peak load values, and status of zero sequencing voltage ("3V0") upgrades (i.e., scheduled and completed) at the substation level.[170] During spring 2018, Con Edison, along with the Joint Utilities, prioritized this work as "Stage 2.1" and Con Edison published its available data to the hosting capacity and system data portal in April 2018.

Stage 3.0 Hosting Capacity

On October 1, 2019, Con Edison released its Stage 3.0 HCA, which presented results at the sub-feeder level to increase granularity and considered existing solar PV to improve accuracy. The Stage 3 map shows changes in hosting capacity along a feeder using the previous color coding. The sub-feeder hosting capacity is noted as "Local Hosting Capacity for PV" when line segments are selected in the displays. The analysis also explicitly modeled existing PV and other installed DG in the circuit load curves and load allocations, which provides a more accurate view of available capacity.

Stage 3.1 Hosting Capacity

The Joint Utilities released Stage 3.1, which makes available downloadable .csv or .xlsx files of feeder-level summary data currently included in the map pop-ups. Con Edison preceded the Joint Utilities in this functionality, incorporating it into a 2018 release. Con Edison made incremental adjustments as part of Stage 3.1, including adding notes on circuit-specific conditions for greater clarity and explanation.

Stages 3.2-3.4 Hosting Capacity

The next several iterations of hosting capacity functionality updates covered a broad spectrum of platform enhancements including NWS, LSRV, EV charging capacity, and REST API views. Each view and its associated level of functionality are covered in greater detail above.

Stage 3.5 Hosting Capacity

In the spring of 2022, the Joint Utilities released Stage 1 Storage Hosting Capacity Maps as part of the Stage 3.5 HCA. Following the Stage 1 release, the Joint Utilities released Stage 2 in April 2023. Additional information on the Stage 3.5 release can be found in the *Current Progress* section above.

Future Stages of Hosting Capacity

Subsequent stage releases will further enhance the information provided on the hosting capacity portal. The Joint Utilities are evaluating options to further improve the analysis and will continue to solicit input from stakeholders on the continued development of the Hosting Capacity Roadmap. Possible enhancements in upcoming stages include:

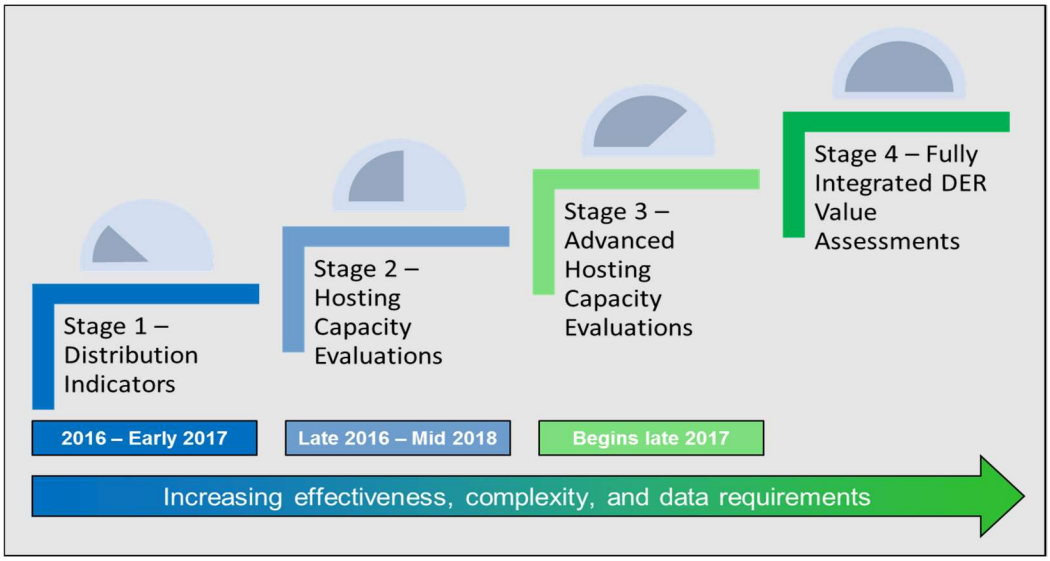
- Additional map functionality
- Forecasted hosting capacity
- Circuit reconfiguration assessments and operation flexibility
- Increased temporal granularity
- Annotated circuit notes – additional system data on upstream constraints

[170] 3V0 upgrades are not applicable to Con Edison's network system.

b. the original project schedule;

The Joint Utilities adopted a multi-phased approach for developing HCA capabilities that are paced with the evolution of hosting capacity tools, models, and processes. Figure 28 details the original project schedule as included in the Supplemental DSIP.

Figure 28: Original Joint Utilities Hosting Capacity Roadmap from Supplemental DSIP[171]



c. the current project status;

Con Edison has completed Stage 3.5. The Company, along with the Joint Utilities, are evaluating further refinements based on stakeholder needs and ongoing tool development.

d. lessons learned to-date;

The hosting capacity work streams have created numerous processes for not only the refinement of data, but also the ways in which it is exchanged between systems and utilized for calculations and visualization. Con Edison used lessons learned from Stage 2 to inform the more granular Stage 3 calculations and visualizations at the line segment level. Lessons from Stage 3 implementation, including reconciliation processes between mapping and modeling data, are also expected to inform future hosting capacity development by allowing greater automation, timeliness of updates, and identifying areas in datasets that will be further refined on the GIS Roadmap.

Con Edison has been able to leverage the calculation and visualization tools developed throughout the hosting capacity process in creating not only secondary screening tools for interconnection, but also applications that can be used by engineers when performing system impact studies at various stages in the SIR process. Additionally, many of the database and visualization learnings were direct inputs into the design and structure of the DERMS pilot. The lessons learned in regard to identifying systems of record and data formats provided a foundation of understanding when

[171] Note 18, *supra*, p. 48.

determining which DERMS POC modules may be ready for development versus which modules would require initial data refinement.

The consistent use across the Joint Utilities of Esri's ArcGIS tool for displaying hosting capacity has also facilitated additional knowledge sharing on best practices and implementation challenges. [172] Con Edison continues to coordinate with the other utilities on a consistent coloring scheme for each utility's hosting capacity map, making it easier for developers to interpret information for each utility.

Additionally, by engaging directly with stakeholders and monitoring activity within the hosting capacity maps, Con Edison learned that while some developers leverage the hosting capacity maps to inform business development activities, others rely primarily on the interconnection process to meet business needs. Given the Company's simultaneous efforts to enhance the interconnection process, Con Edison learned that, in many cases, the timely results achievable through the interconnection process obviate the need for developers to utilize the hosting capacity maps.

e. project adjustments and improvement opportunities identified to-date; and

In addition to lessons learned through internal work, Con Edison benefited from stakeholder input. One recurring element from the development community related to the value of data visualization. In response to stakeholder feedback, Con Edison and the Joint Utilities prioritized the analysis and development of sub-feeder level hosting capacity as part of Stage 3.0. This complemented the previous incorporation of NWS, LSRV areas, and various system data elements into the hosting capacity and system data mapping environment. The Company's experience with Scenic Hudson has also expanded potential hosting capacity scope to the extent that third party community advocates and planners can play an active role in shaping the bounds of hosting capacity. An embrace of CLCPA values means a greater reliance on such stakeholders to provide valuable data and input from community and municipality perspectives, helping to guide projects not only to areas that may have economic value for a developer, but to also meet the energy needs and values of the communities where these projects reside in an effort to promote environmental justice.

f. next steps with clear timelines and deliverables.

Per the annual refresh cycle, Con Edison will refresh its HCA in October 2023. The Company plans to review additional scenarios based on the ITWG collaboration with stakeholders, working toward advancing its datasets and enhancing granularity throughout the next stages of the Storage Hosting Capacity Roadmap.

2) Describe where and how DER developers/operators and other third parties can currently access the utility's hosting capacity information.

Information regarding hosting capacity and access to the hosting capacity and system data portal can be found on the Company[173] and JU[174] hosting capacity websites, respectively.

3) Describe how and when the existing hosting capacity assessment information provided to DER developers/operators and other third parties will increase and improve as work progresses. This should include discussion of the transition of hosting capacity information access from the utility's current hosting capacity information portal to the statewide hosting capacity solution in development on the IEDR.

[172] Esri ArcGIS landing page: https://www.esri.com/en-us/arcgis/about-arcgis/overview.
[173] Note 39, *supra*.
[174] Note 40, *supra*.

Responding to requests from the developer community, Con Edison has delivered EV capacity, energy storage capacity, and REST API data in the hosting capacity portal. Con Edison also anticipates that continued model and data refinement will further clarify existing values as work progresses to meet these objectives.

The Company is transmitting and sharing all of its data from hosting capacity with the IEDR. The current IEDR functionality is more limited than the Company's hosting capacity portal. Con Edison anticipates that IEDR functionality will continue to improve through use case iteration; however, the Company also expects that its customers will continue to look to its hosting capacity portal for information.

4) **Describe the means and methods used for determining the hosting capacity currently available at each location in the distribution system.**

Con Edison, along with the Joint Utilities, employed a streamlined approach to hosting capacity calculations that focused on the siting of larger commercial PV installations. This decision was made to guide developers toward areas on the distribution system that would be more accommodating to commercial-scale projects. The values produced on a circuit-by-circuit basis can also be valuable to site smaller rooftop solar projects as well.

The Joint Utilities validated and utilized the DRIVE tool to facilitate the calculation of the overhead and radial portions of the service territory. Con Edison created and refined minimum load flow cases based on historically observed values at the area substations and distribution transformers, where applicable. The minimum daytime load is used to most accurately simulate a low-load condition when PV generation is generating at a significant portion of its nameplate capacity in order to determine the hosting capacity limit during "worst case" conditions. These minimum load cases were coincident with peak PV output times between 11:00 a.m. and 2:00 p.m. The resulting datasets from these load flow simulations were exported to the DRIVE tool, where centralized DER was applied until the circuits reached excursion thresholds for voltage, loading, and protection concerns. To support consistency in approach, the Joint Utilities adopted a common set of specifications to inform the analysis.

Con Edison validated the results of the DRIVE tool during the overhead calculation process and worked to incorporate the specification and threshold elements of the tool into the Company's network-level HCA. The DRIVE tool is not built to evaluate secondary mesh distribution systems. However, Con Edison was able to incorporate the same thresholds and methodologies into the utility load flow program to produce results consistent with the overhead analysis. The load flow tool builds the same minimum load case (11:00 a.m. to 2:00 p.m.) based on historical interval data that is observed at the distribution transformers. For structures in the network that would accommodate an interconnection application, nearby distribution transformer loads are analyzed and algorithmically distributed to the various sites for analysis against potential PV. The program compares the load flows to the same EPRI values or voltage, load, and protection excursions to determine a maximum hosting capacity value.

For the Storage Hosting Capacity Maps, each circuit's hosting capacity is determined by evaluating the potential power system criteria violations as a result of charging and discharging systems. The analyses represent the overall feeder level hosting capacity only, and do not account for all factors that could impact interconnection costs. To calculate the hosting capacity, the output change for voltage deviation was input as 100 percent and therefore assumes the ESS will not operate at a full power flow charge (i.e., full charge to full discharge). The analyses also assume energy storage operation between 10am-8pm only.

5) **Describe the means and methods used for forecasting the future hosting capacity available at each location in the distribution system.**

Consistent with the 2023 DSIP Guidance, the Joint Utilities will continue to evaluate options for forecasting hosting capacity that take into account the accuracy of such an analysis given the uncertainty in the location, timing, and

configuration of DER adoption forecasts; projected changes to individual customer loads; and any upgrades or changes to the utility system. When forecasting hosting capacity, the addition of generation at various points on a feeder can significantly impact the circuit-level hosting capacity. Additionally, it is more complex to forecast hosting capacity down to the individual property level, as HCA can be sensitive to changes in a single customer's load.

The roadmap for forecasting hosting capacity must incorporate models of future utility system configurations, gross load forecasts, and DER forecasts. Each model has its own roadmap and consideration of scenario-based planning, probabilistic, and deterministic approaches. These concepts must be integrated to produce a hosting capacity forecast, and it must be decided what level of granularity is appropriate before the level of uncertainty rises significantly. Going beyond the initial HCA to forecast these values will require an even greater level of complexity on top of a process that already entails high levels of variability in results.

6) **Describe how and when the future hosting capacity forecast information provided to DER developers/operators and other third parties will begin, increase, and improve as work progresses.**

The Joint Utilities continue to hold stakeholder engagement sessions to solicit input from developers on additional enhancements to the hosting capacity portal, including increasing the frequency of updates to the analysis and providing additional information such as forecasted hosting capacity evaluations. The stakeholder engagement sessions in 2021 and 2022 furthered the considerations of providing hosting capacity forecasts and the timing of its release. Forecasted hosting capacity and other enhancements will continue to be discussed with stakeholders for inclusion in subsequent releases through 2023 and beyond.

7) **Summarize the utility's specific objectives and methods for:**

   a. **identifying and characterizing the locations in the utility's service area where limited hosting capacity is a barrier to productive DER development, directing users to the CGPP filing for further information; and**

Con Edison's experience indicates that the dense urban nature of its load area is a primary factor in considering the capacity to host DG. Given the load density, Con Edison can host a significant amount of DG without hitting system constraints. That said, the urban environment also limits the land and structures available to cost-effectively site larger DG systems. While land and roof space may be more available in Con Edison's outlying suburbs, these areas are often characterized by a distribution design using 4 kV feeder circuits, which can limit hosting capacity. The ongoing VVO Program will help increase hosting capacity in these areas by effectively managing system voltages to accept higher levels of PV without hitting high voltage constraints. The Company has completed the installation of VVO controllers and communicating modems at 4 kV unit substations. Con Edison will upgrade pole top voltage regulators with remote M&C capabilities to provide more precise and flexible voltage regulation.

Con Edison's low voltage meshed grid in its dense urban areas requires separate review given the different constraints involved with limiting hosting capacity. In these areas, the primary constraint involves tripping a local breaker when reverse power flow occurs in a distribution transformer. Con Edison has taken innovative steps in research and design to accommodate this reverse power flow due to PV systems and thus has significantly increased hosting capacity.

Hosting capacity focuses on the amount of DER accommodation that will not adversely impact power quality or reliability and will not require infrastructure upgrades. Where limited hosting capacity exists in the Company's service territory, the CGPP will help address electric grid expansions that will enable the unlocking of renewable generation capacity. The CGPP will also provide headroom analyses available on the existing LT&D systems and additional capacity and energy headroom that would be created by implementing solutions on local system constraints. The current CGPP

Proposal[175] and associated cycle implementation, filed on January 5, 2023, provides a detailed approach to the State's electric grid using a 20-year planning horizon.

b. timely increasing hosting capacity to enable productive DER development at those locations, directing users to the IEDR platform when applicable for more information.

As noted above, VVO is expected to provide advanced voltage management, which will allow for increased hosting capacity in Con Edison's non-network design areas. Additionally, as discussed above, the Company has introduced new design standards in low-voltage meshed designs to allow for bi-directional power flow in these systems typical of dense urban areas. This innovative design change to the network protector relay standards will result in an increase to hosting capacity. The Company has an active program to upgrade protective relays in support of its Grid Modernization Plan.

The Company has also begun internal efforts to evaluate smart inverter functionality as a potential solution for monitoring and autonomous control that may alleviate the need for more costly solutions. The Company is transmitting and sharing all its hosting capacity data with the IEDR. The Company's customers continue to use the current Hosting Capacity Web Application site in the near-term.

[175] Note 27, *supra*.

2.10. BILLING AND COMPENSATION

Context and Background

Billing is a core utility function and a primary channel for customer engagement. The bill represents the result of the customers' interactions with DER providers and/or utility programs. For instance, customers that participate in EE programs will see reduced consumption and positive savings on their monthly bills. Similarly, customers that subscribe to a CDG project will see a credit for their share of the facility's production. Con Edison recognizes that monthly bills are often the only interaction customers have with their local utility. For the Company, this means that effective and efficient billing and compensation procedures remain a key component of the core business. Billing and compensation methods must be timely, provide a sense of transparency, and reflect a high degree of accuracy based on levels of consumption or generation.

In order to meet the clean energy targets emphasized in the CLCPA[176], New York State will need to continue to accommodate increased levels of DER. Supporting increased sources of renewable generation necessitates robust DER-related billing and compensation programs designed to bolster program participation and continue momentum toward State policy objectives.

Identifying the locational and temporal value of DER to the electric distribution system has long been a focus of the REV Proceeding. In general, the value of a DER is higher in constrained areas and during times of the system peak relative to the same type of DER deployed in an unconstrained area operating off-peak. The Company has proactively engaged with DER providers and DPS Staff to develop and implement compensation for DER programs that reflect their value to the electric system. Developing compensation mechanisms for these DER programs often varies based on the type of program or technology, and policy for these programs has been advanced in several proceedings.

On March 9, 2017, the PSC issued the VDER or ("Value Stack") Transition Order, enabling the "transition to a distributed, transactive, and integrated electric system by compensating DERs based on the actual value provided by those resources"[177] as envisioned in the REV Proceeding[178]. The Value Stack methodology compensates DERs for the calculable benefits they provide in injecting energy into the utility's system. Values are calculated based on the overall utility costs that DERs offset. Under the VDER Transition Order, the Commission established guidance for the Joint Utilities to transition from the net energy metering ("NEM") tariff to the VDER Phase One NEM. Following the VDER Order, the Commission established the VDER Implementation Order outlining the details for effective tariffs based on the Value Stack compensation methodology.[179] To further refine this methodology, on April 18, 2019, the Commission issued the

[176] Note 13, *supra*.
[177] Case 15-E-0751, In the Matter of the Value of Distributed Energy Resources ("VDER Proceeding"), *Order on Net Energy Metering Transition, Phase One of Value of Distributed Energy Resources, and Related Matters* ("VDER Transition Order") (issued March 9, 2017).
[178] Case 14-M-0101, Reforming the Energy Vision, *Order Adopting Regulatory Policy Framework and Implementation Plan* (issued February 26, 2015) ("Track One Order"); *Order Adopting a Ratemaking and Utility Revenue Model Policy Framework* ("Track Two Order") (issued May 19, 2016).
[179] VDER Proceeding, *Order on Phase One Value of Distributed Energy Resources Implementation Proposals, Cost Mitigation Issues, and Related Matters* ("VDER Implementation Order") (issued September 14, 2017).

Order Regarding Value Stack Compensation.[180] In summary, the order aimed to improve the Value Stack by providing "appropriate price signals and compensation so that developers and customers design and invest in projects that provide net benefits to the electric distribution grid and will result in appropriate compensation for those benefits".[181]

Compensation for CDG projects has been further defined in the Consolidated Billing for DER Proceeding[182]. On December 12, 2019, the Commission issued its Order Regarding Consolidated Billing for CDG[183], directing the Joint Utilities to implement net crediting as a consolidated billing option for all CDG projects, both existing and new. Under the net crediting model, CDG Sponsors or developers of eligible generation projects such as solar PV, are paid a monthly subscription fee by members sharing a particular CDG project, which could consist of fixed or variable rates. When a CDG Sponsor's project injects electricity into the utility's distribution system, the utility will apply a credit to the customer's or CDG Member's bill commensurate with the CDG Savings Rate designated by the Sponsor. The utility also adds the CDG Sponsor's monthly subscription fee to the customer's bill. Net crediting is intended to reduce customer acquisition and financing costs, particularly enabling low-income customers' participation in the State's clean energy efforts. Net crediting was also designed to reduce the confusion associated with two separate bills and payment requirements that may discourage CDG participation.

Implementation Plan, Schedule, and Investments

Current Progress

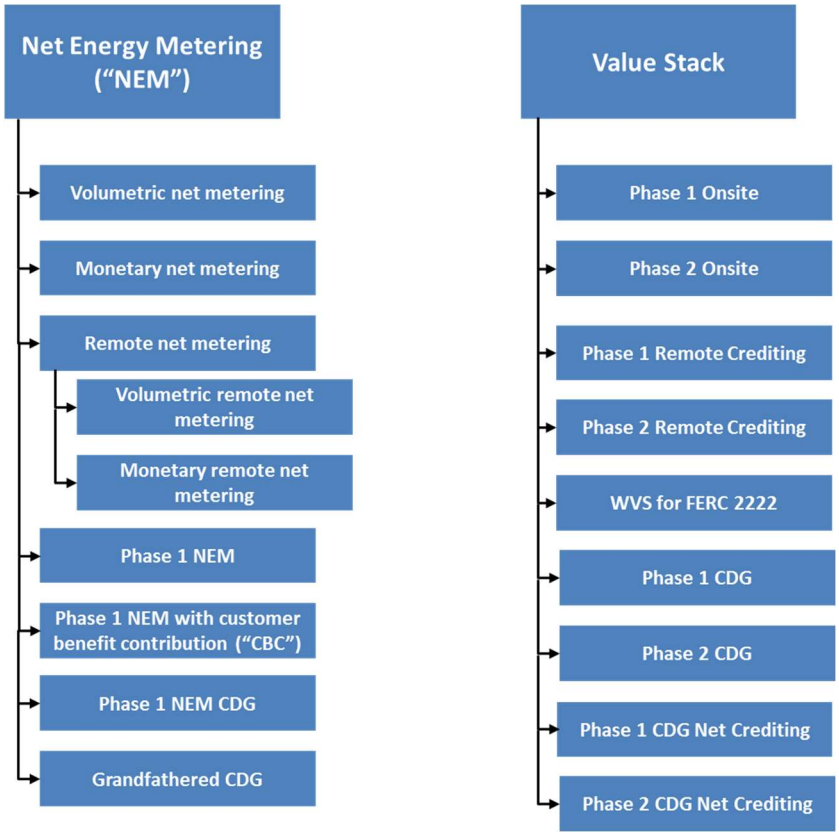
Summary of Achievements

- Developed and launched numerous DER compensation programs, such as Value Stack Remote Crediting.
- Completed early phases of the implementation of a new CSS.
- Enrolled over 100 projects and their subscribers in net crediting.
- Collaborated with stakeholders and the Joint Utilities in the CDG Billing & Crediting Working Group.

Con Edison currently maintains the following compensation programs in **Figure 29** below:

[180] VDER Proceeding, *Order Regarding Value Stack Compensation* (issued April 18, 2019).
[181] *Ibid*, p. 35.
[182] Case 19-M-0463, In the Matter of Consolidated Billing for Distributed Energy Resources ("Consolidated Billing for DER").
[183] Consolidated Billing for DER, *Order Regarding Consolidated Billing for Community Distributed Generation* (issued December 12, 2019).

Figure 29: Con Edison Compensation Programs



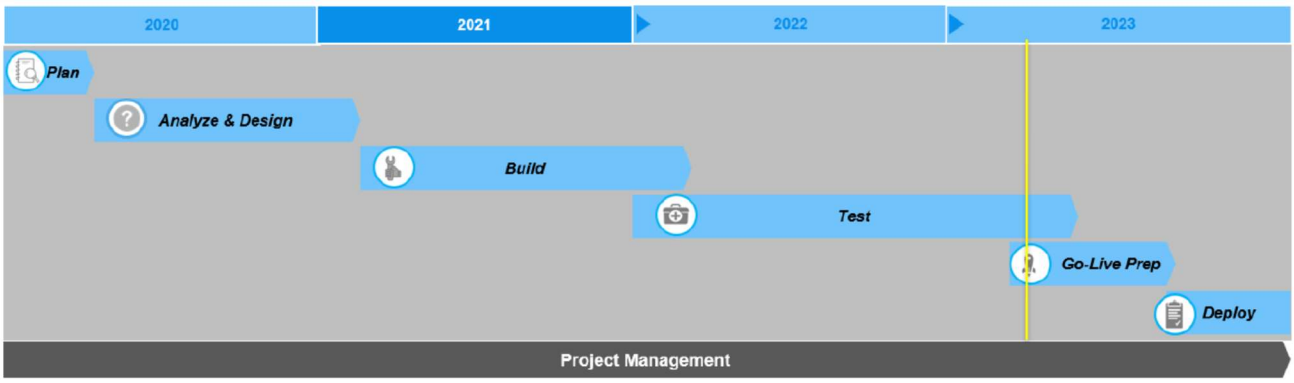
The Company began offering Net Crediting (also known as Consolidated Billing) for monetary Value Stack customers in October 2020, providing an alternative payment and crediting methodology for CDG Hosts and CDG Satellites and eliminating the need for a separate participation payment from the CDG Satellite to the CDG Host. The program facilitates crediting the CDG Satellite's bills directly for the net credit and paying the CDG Host the remaining value of the credit, less a utility administrative fee. However, the same program rules do not apply to grandfathered volumetric projects that currently allocate kWh to CDG Satellites. Con Edison is currently working with DPS Staff and stakeholders to develop an alternative Net Crediting Program for these types of projects.

In 2017, the Company created the Value Stack mechanism to compensate DERs based on when and where they provide electricity to the grid. This program compensates enrolled resources for their eligible contributions to Energy Value through the Location Based Marginal Price ("LBMP"), Installed Capacity ("ICAP"), Environmental Value, Demand Reduction Value ("DRV"), and Locational System Relief Value ("LSRV").

The Company's new WVS tariff seeks to maximize dual participation opportunities and avoid duplicative compensation issues for customer-generators, granting them the ability to receive energy and capacity payments through the NYISO directly or through aggregation. Moving energy and capacity payments from the Company to the NYISO allows customer-generators to continue receiving VDER non-capacity and non-energy payments from the Company.

The Company's implementation of its CSS is central to its ability to automate DER billing processes. Since 2020, Con Edison has been pursuing a phased deployment of its CSS and is currently in the Testing phase.[184] The details of the project timeline can be seen in below Figure 30.

Figure 30: CSS Project Timeline

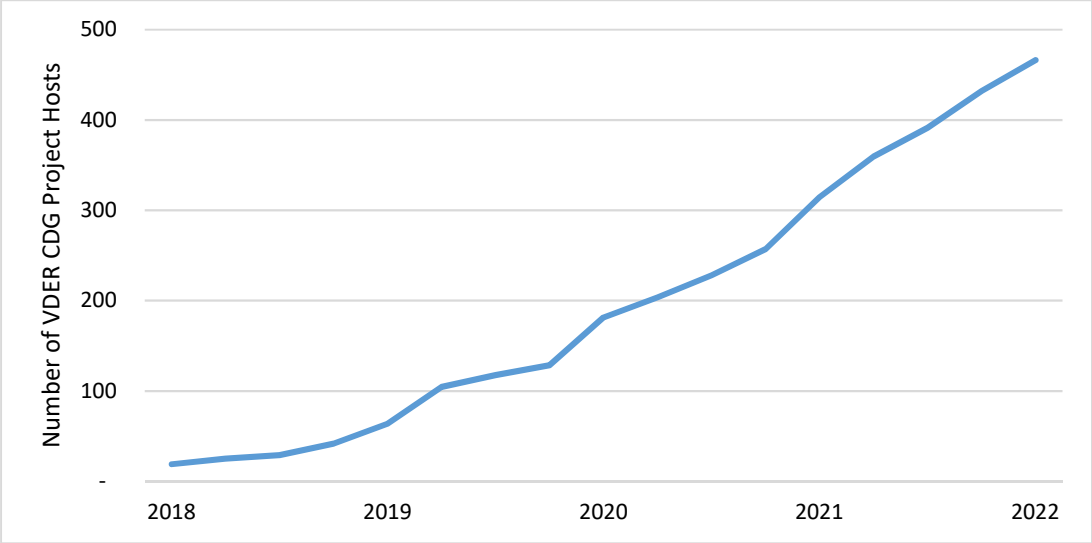


- **Plan:** Define project plans for major workstreams and conduct final preparations for Analyze & Design phase.
- **Analyze & Design:** Break down the detailed business process flows into more granular individual activity and steps to determine how the process changes should be designed to support the defined To-Be business processes.
- **Build:** Refine the system requirement, configuration, integration, extension, and data conversion designs until they are concrete and detailed enough to be built.
- **Test:** Test every aspect of the solution to ensure that the end-to-end product works as expected. Training also begins during this phase so that future system users are given the foundational knowledge required to smoothly transition to the new system at Go-Live.
- **Go-Live Prep:** Once the system is fully tested, the effort can shift from building and testing the solution to preparing for it to be put in place.
- **Deploy:** Conduct all Go-Live activities and manage any system issues or defects that may arise once the system is live will so as to address and resolve them during this phase. In addition, this phase will extend beyond the "go-live" date to support operations as the new system is deployed.

Billing automation is necessary to support the widespread adoption of CDG projects in the Con Edison's service territory and provide timely and accurate billing for customers. From 2020-2022, the number of VDER CDG project hosts has more than doubled as shown in Figure 31 below. In January 2023, the Company filed its most recent implementation plan detailing its progress toward automation of crediting and billing of CDG.[185] The plan detailed the billing system constraints, the changes necessary to effectuate automated CDG billing, and the steps and timeline to achieve full automation of CDG billing.

[184] Quarterly status reports on the Company's CSS implementation can be found in Case 19-E-0065.
[185] Consolidated Billing for DER, *Con Edison CDG Billing & Crediting Automation Plan Update* (filed January 17, 2023).

Figure 31: Cumulative Number of CDG VDER Project Hosts



Future Implementation and Planning

Summary of Future Actions

- Launch the CSS in late 2023.
- Execute plans for developing automated processes and capabilities (e.g., Net Crediting billing or Opt-Out CDG) in the Company's new CSS.
- Support DER participation in the NYISO wholesale markets with the initial April 2023 launch and prepare for the 2026 FERC Order 2222-compliant model.
- Continue to promote market growth and DER utilization through tariffs.
- Continue collaboration with CDG Billing & Crediting WG on key topics including expanding existing programs and further developing the net crediting model.

In addition to existing compensation programs, an additional program – volumetric net crediting – will be implemented as early as year-end 2024, subject to applicable tariffs approved by the Commission. The Company continues to devote the appropriate time and resources to support each of these programs from design, programming, and implementation to ongoing IT and administrative maintenance. The Company also devotes substantial work, along with stakeholders, to considering the interaction between these and other non-DER related programs such as time of use and budget billing, as well as opting-in, opting-out, switching, and banking.

In collaboration with the Joint Utilities, Con Edison has been working toward automation of the Value Stack billing process in its legacy Customer Information System ("CIS") and new CSS since late 2017. This includes the programming of all aspects of Value Stack compensation, including the calculations of each of the Value Stack component for onsite projects, Remote Net Metered (now Remote Crediting) projects, and CDG projects, as well as the details of transferring

credits to subscribers and satellites, tracking each Value Stack component in customer banks, and compiling information for both host and satellite accounts. Given the limitations of the legacy CIS, many of these steps have been accomplished manually.

Future implementation efforts are underway for several different programs. The Company will support wholesale market developments to address FERC Order 2222. Additionally, the Company will continue to refine new retail programs, like the Host Community Benefit Program and the new Solar for All Program, giving its customers increased clean energy optionality. Each of these programs are discussed in further detail below.

Wholesale Market Developments

Con Edison has continued to interface with the NYISO after the launch of the DER Aggregation Market. The NYISO launched its initial market at the end of April 2023 and will expand the market for full compliance with FERC Orders 2222 and 841 by 2026. Discussions between the Joint Utilities and the NYISO have centered on developing processes and handoffs between the NYISO and the utilities to enroll, assess, track, monitor, and compensate DER aggregations participating in the market. Through these discussions, the Company has continued to evolve internal processes, including those related to compensation and billing systems administration. The Company is implementing the appropriate changes in its internal billing systems administration and is prepared for the NYISO's market launch this year.

Con Edison has reviewed and identified tariff changes that will be necessary to further enable the NYISO's April 2023 market launch and future expansion. The Company received approval for its proposed retail tariff changes in March of 2023.[186] The changes are intended to preclude dual market participants from receiving duplicative compensation in both wholesale and retail markets concurrently. The NYISO expects DER aggregators to transact in the NYISO markets in late 2023. Accordingly, the Company plans to file proposed changes to its existing WDS with the FERC in mid-2023. Moving forward, Con Edison will continue to interface with the NYISO as it prepares for the 2026 market expansion. In parallel, the Company will continue to assess and implement as appropriate any supporting utility compensation and billing practices to enable expanded DER participation in the 2026 market launch.

Host Community Benefit Program

This program will provide an annual bill credit to residential electric utility customers with premises located in a renewable Host Community for each of the first ten years that a "Major Renewable Energy Facility" (greater than or equal to 25 MW) operates in that Community. The Renewable Owner of a Facility will fund the credits by paying an annual fee of $500 per MW of nameplate capacity for solar facilities, and $1,000 per MW for wind facilities. The fees paid by the Facility, less utility administrative fees, will be distributed equally among the residential utility customers within the Host Community. The Company filed its Implementation Plan with draft tariff leaves on September 30, 2021, as directed by the *Order Adopting a Host Community Benefit Program,*[187] issued on February 11, 2021. Con Edison is awaiting further approval by the Commission of the Implementation Plan and tariff leaves.

[186] Case 22-E-0549, In the Matter of the Federal Energy Regulatory Commission (FERC) Order Nos. 2222 and 841, to Modify Rules Related to Distributed Energy Resources, *Order Approving Tariff Modifications* (issued and effective March 17, 2023): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={2066F086-0000-C919-82EE-FFA3F907A5BF}.
[187] Case 20-E-0249, In the Matter of Renewable Energy Facility Host Community Benefit Program, *Order Adopting a Host Community Benefit Program* (issued February 11, 2021).

Expanded New Solar for All

On May 19, 2023, DPS Staff issued a proposal[188] for a statewide Expanded Solar for All ("E-SFA") Program with a target to commence credit distribution to customers in 2025. Expanded Solar for All is a New York State utility bill assistance program for income-eligible households that aims to offer access to community solar. DPS Staff's proposal also recommended the inclusion of retail energy storage to address markedly lower availability of solar capacity in the Company's service territory compared to the number of customers participating in its Energy Affordability Program ("EAP"). The inclusion of retail energy storage would help reduce and possibly eliminate community solar siting constraints that inhibit the savings range for EAP customers. Con Edison continues to work with New York State entities and stakeholders to develop an E-SFA implementation plan.

CSS Go Live

The Company is in the process of replacing Con Edison's legacy billing systems with a single instance of Oracle's Customer Care and Billing ("CC&B"). By utilizing an off the shelf software product, the Company will benefit from regular base product upgrades and support. The new CSS will enable the Company to better respond to growing business demands, new policy initiatives, and meet customer expectations. The CC&B system allows for more dynamic customer and rate configuration, permitting the Company to rely less on customized enhancements to meet new business needs. The Company is currently working through remaining testing and preparing for system deployment.

The new system is a transition away from the Company's current premise-based billing system to a customer-based model. The customer-based model allows for multiple service contracts to be associated with an individual customer or company. This new system architecture will enable the development and analysis of enhanced customer energy usage characteristic to be used in the development of new services.

Risks and Mitigation

The primary risk to timely implementation is the complexity of the changes to billing that are often needed. New programs or program requirements generally require changes to the billing system. The Company's legacy systems are designed for comparatively simple and straightforward billing based on customer usage; however, new program compensation designs often require significant changes or upgrades. Each new change can interact with other recent changes to add further complexity. Furthermore, custom programming requires multiple iterations of testing, and subsequent changes to billing can restart the testing process. Implementation may require manual efforts while automations are planned, developed, tested, and deployed.

Additionally, manual shadow billing is required until new systems are verified to work as intended. Integrating large numbers of customers and scaling quickly for increased rates of adoption prior to the automation process presents additional challenges. Con Edison mitigates these risks by engaging additional resources to complete the work and communicating with stakeholders and regulators about the process to establish full understanding of the steps and timeline involved.

Stakeholder Interface

The Company recognizes that stakeholder engagement and developing inclusive regulatory policy to achieve desired outcomes is an important part of customer satisfaction. The Company has hosted or participated in many stakeholder

[188] Case 19-E-0735, *Petition of New York State Energy Research and Development Authority Requesting Additional NY-Sun Program Funding and Extension of Program Through 2025*, Department of Public Service Staff Proposal on a Statewide Solar for All Program (issued May 19, 2023).

engagement sessions to continually provide information to customers and industry participants. Past and planned presentations, webinars, and workshops centered on various utility program topics, such as net crediting, value stack, and remote crediting. Collaboration between the Joint Utilities, the NYISO, and stakeholders is ongoing for the DER Participation model and FERC 2222 implementation.

The Company participates in monthly meetings for the CDG Billing and Crediting Working Group. Con Edison also participated in the stakeholder conferences on CDG billing and crediting hosted by the Commission in November 2022 and February 2023.

Additional Detail

This section responds to the questions specific to billing and compensation.

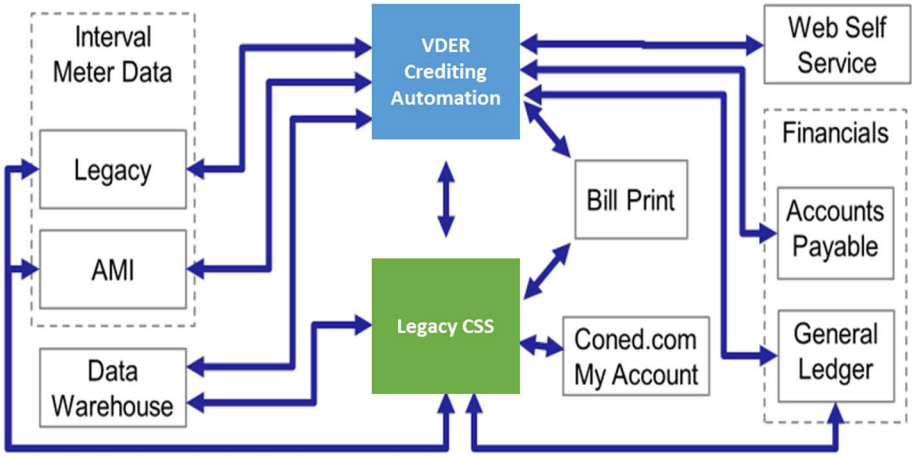
1) **Describe the various DER-related billing and compensation programs (including demand response) implemented or revised by the utility since the last update. For this first inclusion in the DSIP, describe developments that have occurred since the beginning of NEM, RNM, CDG, and VDER.**

See the discussion above under *Current Progress* which details the DER-related billing and compensation programs implemented and revised by the Company.

2) **Describe the customer billing/compensation functions and data generally needed to expand deployment and use of DERs in the utility's service area. Include descriptions of the existing and planned components (processes, resources, and data exchanges) that will support those needs. For planned components, provide the sequence and timing of key investments and activities required for component implementation.**

The customer billing functions that Con Edison leverages for billing and compensation of its DER programs include billing and crediting, program management, call center support, accounting, rate engineering, data sharing, and reporting. Specific data needs vary depending on the program, but generally include meter data from the AMI data repository, account information from the CSS, DER information from the PowerClerk® interconnection portal, and financial data. Additionally, specific data needs from NYISO- and NYSERDA-managed systems focus on the reporting and synchronization of customer registration. A simplified view of the VDER system architecture and data sets is shown below in Figure 32.

Figure 32: Simplified VDER System Architecture



Planned investments to enhance these functions include the Company's new CSS, going live later this year, and those described above in the 'Future Implementation and Planning' section.

3) **Describe the customer billing/compensation functions and data needed to enable DER participation in the NYISO's wholesale markets for energy, capacity, and ancillary services. This should include information regarding the utility's implementation of its Wholesale Distribution Service (WDS), Wholesale Value Stack (WVS), and related non-wholesale value stack (VDER without wholesale energy and capacity components). Also include descriptions of the existing and planned components (processes, resources, and data exchanges) that will support those needs. For planned components, provide the sequence and timing of key investments and activities required for component implementation.**

The customer billing and compensation functions described in "2)" above also apply to NYISO wholesale market participants. In addition, because wholesale market participants will receive energy payments and capacity payments, as applicable, from the NYISO, coordination, verification, and settlement functions are also needed. Design of these new functions require involvement from the Company's rate engineering, customer operations, and CES program teams.

4) **Describe the utility's plans to implement or modify DER-related billing and compensation capabilities, including automation, to address the Community Distributed Generation (CDG) billing and crediting problems that were the focus of the Commission's September 15, 2022, Order in Cases 19-M-0463, et. al.[189]**

The Company provides detailed implementation and modification plans in case 19-M-0463, *In the Matter of Consolidated Billing for Distributed Energy Resources*.[190] Links to supported filings are located below in Table 18. The Company will continue to develop updated implementation plans until it achieves the full automation of DER billing and compensation functions.

Table 18: Con Edison Consolidated Billing for DER Resources

Supported Filing	Link
CDG Billing & Crediting Automation Implementation Plan	https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bAFBFD1B7-B767-481D-B54A-C290AC900271%7d
Updated Automation Implementation Plan	https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b60F83887-0000-C115-ACE3-63274952ACF7%7d
Annual Net Crediting Report	https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b90483987-0000-C111-9D96-B55664820B1F%7d

5) **For each type of DER billing and compensation, including for CDG and wholesale market participation, describe the current information system constraints preventing full automation of DER billing and compensation.**

Con Edison has been actively engaged in addressing concerns and automation constraints for Value Stack CDG projects in the interim CC&B automated crediting process and in its new CSS. Full automation will also include net metering for

[189] Case 19-M-0463, In the Matter of Consolidated Billing for Distributed Energy Resources, *Order Establishing Process Regarding Community Distributed Generation Billing* (filed September 15, 2022).
[190] Case 19-M-0463, In the Matter of Consolidated Billing for Distributed Energy Resources (opened June 18, 2019): https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=19-M-0463.

CDG. Automation will address the current manual billing processes for migrating projects, such as review and resolution of all outstanding credits and bills for CDG Host and CDG Subscribers. Some projects also require additional meter programming and updated allocation forms submitted by the CDG Host. The Company continues to focus on these topics, applying dedicated resources to support automation efforts and filing quarterly updates on its implementation plans.

6) **Describe how DER billing and compensation affects other programs such as budget billing, time of use rates, and consolidated billing for Energy Service Companies (ESCOs).**

Generally, DER billing and compensation does not prevent a customer from participating other billing programs such as budget billing, time of use rates, and utilizing an ESCO and/or participating in utility consolidated billing for ESCO supply. When implementing new or updated compensation methodologies, the Company evaluates their impact on other programs. Additionally, some DER programs require customers to take certain rates (or vice versa). For example, a Value Stack customer with an energy storage system that has a peak capacity at least 115% larger than the customer's onsite load is required to take Mandatory Hourly Pricing for supply.

7) **Describe the utility's means and methods – existing and planned – for monitoring and testing new or modified customer billing and compensation functions.**

After the CC&B system is put into production, new rates will be configured in a non-production environment and rate validation will be performed before they are migrated to production. If a new rate or customer compensation can't be implemented utilizing current functionality, system enhancements will be needed to support the new initiative. The Company will work with its CC&B support vendors and internal business and system SMEs to implement the enhancement or functionality. The new enhancement process for CC&B will follow a process similar to the current legacy system. Once a system enhancement has been identified, a process of requirements gathering, solution design and development, validation of the solution in a non-production environment, and finally promotion of the solution to the production system would be followed.

8) **Describe the utility's means and methods – existing and planned – for supporting customer outreach and education, including where and how customers, DER developers/operators and other third-parties can readily access information on the utility's billing and compensation procedures.**

The Company provides a suite of general information that supports customer outreach, education, and billing and compensation procedures for customers, DER developers and operators, and other third parties below in Table 19.

Table 19: Con Edison Billing and Compensation Resources

Resource	Link
About Your Bill & Rates	https://www.coned.com/en/accounts-billing/your-bill
TOU Rates	https://www.coned.com/en/accounts-billing/your-bill/time-of-use
Rates and Tariff Rulings	https://www.coned.com/en/rates-tariffs/rates
Rate Calculators	https://www.coned.com/en/accounts-billing/your-bill/rate-calculators
How to Read a Bill	https://www.coned.com/en/accounts-billing/your-bill/how-to-read-your-bill
FAQs	https://www.coned.com/en/accounts-billing/your-bill/how-to-read-your-bill/understanding-your-bill-faq
Using Private Generation Energy Sources	https://www.coned.com/en/save-money/using-private-generation-energy-sources

19-M-0463, *In the Matter of Consolidated Billing for DERs*	https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Matterc aseno=19-M-0463

9) Describe the utility's means and methods – existing and planned – for receiving, investigating, and monitoring customer complaints and/or inquiries regarding billing and compensation issues related to DERs.

The Company has an established process for addressing billing complaints through its Customer Operations team. Customer complaints or inquiries regarding DER billing and compensation issues are addressed through these established processes with dedicated resources that support DER programs. Customers can access these resources through the contact information listed on their bill.

2.11. DER INTERCONNECTIONS

Context and Background

Bringing DER online quickly and cost-effectively is critical to increasing DER deployment. Hosting capacity maps, described in detail in **Section 2.9**, are valuable tools to help developers with initial project screening and decision-making, but it is greater automation of the interconnection process that will drive enhanced value by quickly advancing viable projects through interconnection by passing the State-developed screens or using screening results to promptly verify the need to perform a CESIR. Greater automation is part of the Commission's vision under the REV initiative for utilities to streamline their interconnection processes for DG projects, increase the transparency of their interconnection approval process, and continue to integrate more significant amounts of DG and storage deployment.[191]

To define the process improvements necessary to streamline the interconnection process, the Commission and NYSERDA engaged the EPRI to assess interconnection procedures in 2016's *New York Interconnection Online Application Portal Functional Requirements* ("IOAP Report"),[192] which served as an initial reference guide for increasing the automation of the online portal. The IOAP Report includes a three-phase roadmap for achieving increased automation:[193]

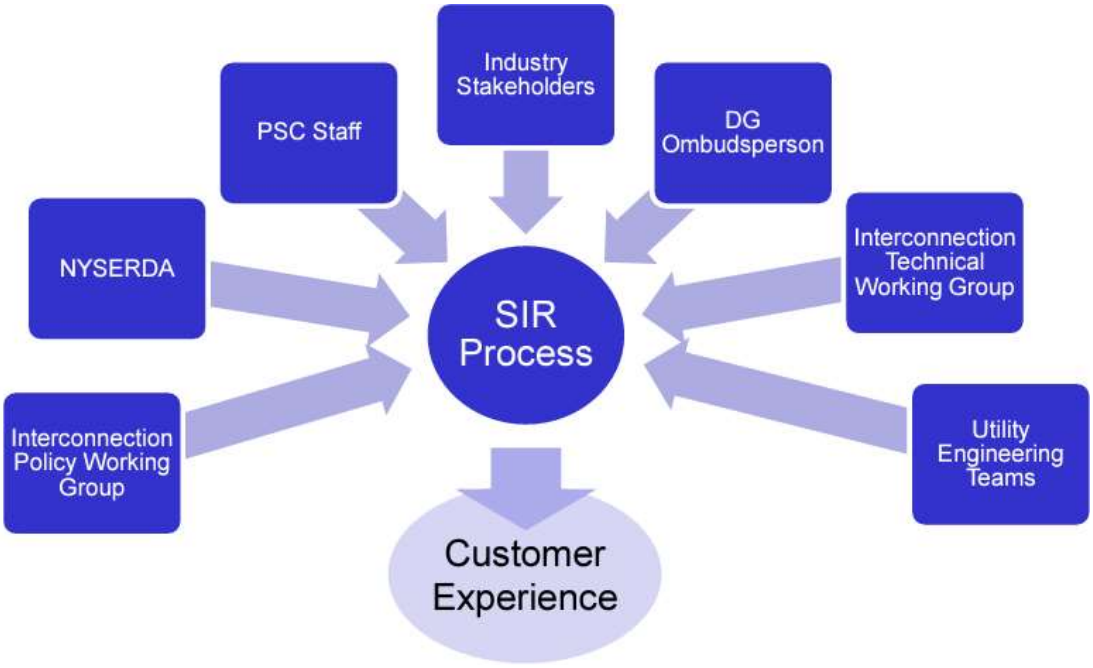
- Phase 1: Automate Application Management
- Phase 2: Automate SIR Technical Screening
- Phase 3: Full Automation of All Processes

The goal of Phase 1 is to automate the application management portion of the process, including application submittal, validation, tracking, and approval. The second phase focuses on automation of the SIR technical screens for projects above 50 kW, including but not limited to a review of the point of common coupling, certification status of specified equipment, and compatibility of the line configuration with the interconnection type. Phase 2 requires integrating multiple utility systems, such as billing, CIS, work management systems, and load-flow software programs, to allow for the push and pull of data in standard formats between systems. This phase also requires calculating SIR screens A to F based on utility data and returning a pass or fail determination.[194] Finally, Phase 3 calls for automating all processes, including integrating the interconnection process into the broader distribution system planning process.

Process improvements occur within the context of the SIR.[195] Established by the Commission in 1999, the SIR provides an evolving framework for processing applications to interconnect DG systems to the State's IOUs' electric distribution systems. The SIR is informed on an ongoing basis by a combination of DG developers and stakeholders, regulatory staff, NYSERDA, utility-led working groups, and ombudspersons.

[191] REV Proceeding, Track One Order, pp. 88-89.
[192] EPRI, *New York Interconnection Online Application Portal Functional Requirements* ("IOAP Report") (issued September 2016): http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/dcf68efca391ad6085257687006f396b/$FILE/EPRI%20Task%201%20Memo%20Report_Final%209-9-16.pdf.
[193] *Ibid,* pp. 13-17.
[194] *Ibid*, p. 24.
[195] New York State SIR: http://www3.dps.ny.gov/W/PSCWeb.nsf/All/DCF68EFCA391AD6085257687006F396B.

Figure 33: Interconnection Process Inputs



Since the 2020 DSIP filing, the SIR has been revised twice, in 2021 and 2022. These updates will help provide greater clarity for developers and enable more DG and ESS to interconnect to the utilities' electric distribution systems. In the most recent revision, the Joint Utilities proposed additional edits to the SIR to incorporate language related to the adoption of Underwriters Laboratories ("UL") 1741-Supplement B ("SB") and IEEE Standard 1547-2018. This work builds off of the Joint Utilities' Smart Inverter Roadmap and the companies' plans to utilize smart inverter technologies.[196] As UL 1741-SB certified and IEEE 1547-2018 compliant inverters start to become available in 2023, the JU will work to have the tools and capabilities in place to fully realize the benefits of this technology, including grid resiliency and reliability and improved situational awareness. Providing guidance for developers in the SIR requires that compliant devices are installed in New York from that point forward, allowing the benefits of those systems to be realized both for system operators and customers[197].

Another meaningful policy change that impacts DER interconnection is the cost-sharing of utility system upgrades. In October 2020, the IPWG filed a petition requesting amendments to the system upgrade cost-sharing provisions contained in the SIR, to supplant the existing cost-sharing methodology which had been in place since January 2017.[198] The changes proposed by the IPWG would remove significant financial burdens imposed by the "first-mover" projects. Under the original cost-sharing mechanism, the "first-moving" or "triggering" project interconnection would bear 100 percent of costs for substation upgrades (i.e., transformer bank upgrades or replacements) to be reimbursed by subsequent projects interconnected on the same substation and benefiting from the same upgrades. However, the original cost-sharing mechanism provided no guarantee for "first-movers" that following interconnection projects would

[196] Joint Utilities of New York, *Distributed System Platform ("DSP") Enablement Quarterly Newsletter*, Smart Inverter Roadmap (November 2021): https://jointutilitiesofny.org/sites/default/files/FINAL%20JU%20NEWSLETTER%20November%202021.pdf.
[197] Additional guidance is available at the DPS website: https://dps.ny.gov/distributed-generation-information.
[198] Case 20-E-0453, *Petition of the IPWG Members Seeking a Cost-Sharing Amendment to the New York State Standardized Interconnection Requirements for New Distributed Generators and Energy Storage Systems 5 MW or Less Connected in Parallel with Utility Distribution Systems* (issued October 29, 2020): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4B2B2DC0-5C29-4E32-9C28-C6946EEA72E6}.

materialize on the same substation and provide cost reimbursement. In essence, "first-mover" DG and ESS project benefits were non-existent in distribution-saturated areas of the Joint Utilities' respective service territories.

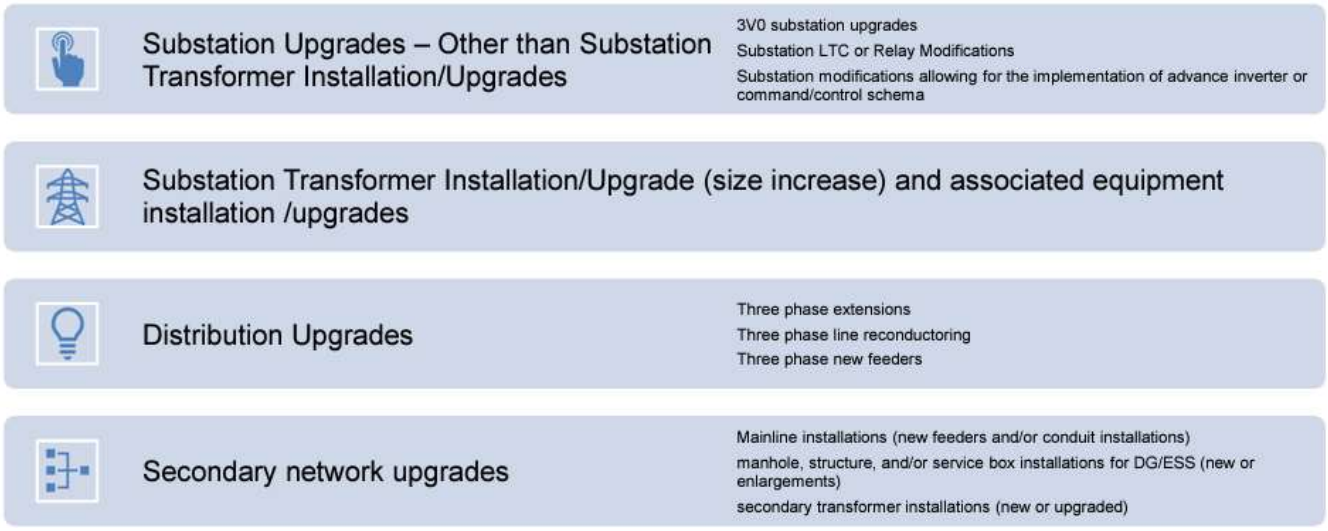
The Cost-Sharing 2.0 Proposal addresses significant financial burdens for certain types of upgrades utilizing a pro-rata concept. This mechanism helps spread the cost of system upgrades equitably to each DG and ESS project interconnecting on the same substation and provides cost certainty at the outset of each project. The Cost-Sharing 2.0 Proposal applies to two categories of distribution upgrades as follows:

- **Utility-Initiated DG/ESS Upgrades** – when a substation transformer bank installation/replacement is in a utility's CIP, the utility will consider options to upgrade the equipment for greater hosting capacity rather than a mere replacement-in-kind.
- **Market-Initiated DG/ESS Upgrades** – when a qualifying upgrade is required to interconnect a project, the utility will perform a detailed study to develop a cost estimate and construction schedule for the upgrade. Through the CESIR, the utility will assign the Triggering Project and any Sharing Project its share of the upgrade charges. For distribution, sub-transmission line, and underground secondary network upgrades, the utility will charge the Triggering Project the full cost estimate, and later projects will be charged a pro rata share and the Triggering Project will be reimbursed based on the benefit granted to the second mover(s).

This proposal was codified by the Commission in a series of Orders. On July 15, 2021, the Commission directed the Joint Utilities, in concert with the IPWG and DPS Staff, to develop and file revisions to implement Cost-Sharing 2.0 with additional modifications.[199] Under the original Joint Utilities' Petition, qualifying upgrades with a gross cost of less than $250,000 would be excluded from Cost-Sharing 2.0 – the Commission recommended a similar application for Con Edison's underground secondary networks as part of the Order Approving Cost-Sharing Mechanism. Finally, on April 14, 2022, the Commission approved the proposed SIR language filed with the IPWG Petition[200] including protections to the ratepayer and a five-year moratorium on free ridership. A detailed explanation of the Cost-Sharing 2.0 mechanism can be found in the New York State SIR.[201]

[199] Case 20-E-0543 and 19-E-0566, *Order Approving Cost-Sharing Mechanism and Making Other Findings* (issued and effective July 16, 2021): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={73FC964F-A7C2-45D0-BB06-8FB2720F9C5C}.
[200] Case 20-E-0543 and 19-E-0566, *Order Approving Compliance Filings, with Clarifications* (issued and effective April 14, 2022): https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={AC049600-CDB0-44D1-8873-B56786DA8670}.
[201] New York State Standardized Interconnection Requirements and Application Process (effective May 1, 2022): https://dps.ny.gov/system/files/documents/2022/11/may-2022-sir-final-dmm.pdf.

Figure 34: Cost-Sharing 2.0 - Market Driven Upgrades



Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Achieved milestone of 500 MW of interconnected DG in March 2023.
- Implemented a series of process improvements in PowerClerk® in response to developer feedback.
- Launched publicly accessible Clean Energy Update in 2022. This quarterly effort tracks the deployment of solar, battery storage, EVs and charging stations, and clean heat projects giving customers access to more renewable information progress.
- Developed Cost-Sharing 2.0 mechanism with the Joint Utilities and DPS Staff, addressing the financial barriers associated with the legacy "first-mover" cost structure for upgrades to utility-owned equipment in the interconnection process.
- Engaged developers through the DER Forum and focus groups to understand user experience and identify potential improvements.
- Supported development of SIR revisions that facilitate interconnection of energy storage, increase flexibility for developers, and clarify interconnection process steps.
- Developed several technical documents and templates to clarify and formalize aspects of the interconnection process.

Building on the significant strides over the last few years to streamline and improve transparency, the Company continues to refine and enhance the interconnection process in response to developer feedback and user experience. Con Edison continues evolving IOAP capabilities and contributing to SIR revisions through Joint Utilities' working groups. In March 2023, the Company celebrated interconnecting 500 MW of DG, in support of the State's policy goal of 10 GW of distributed solar by 2030.

Interconnection Process Improvements

IOAP

The Company continues to leverage the PowerClerk® interconnection software, the Company's ongoing interconnection experience, and developer feedback to identify potential process improvements and create innovative solutions. In response to an increasing volume and complexity of interconnection applications and developer feedback from focus groups convened in 2020, 2021 and 2022, the Company made additional enhancements to the PowerClerk® platform and supporting back-office systems. These enhancements now allow for the following:

- Expansion of fast track (solar projects 25kw or less)
    - The expansion of fast track assists small DG interconnections. In 2022, Con Edison realized over 1,800 additional projects that were able to be fast tracked versus a manual process.
- Internal inquiry system
    - In 2022, distributed energy services partnered with distribution engineering to develop an internal inquiry tool. This allowed customer concerns to be better tracked and managed with internal parties.
- Automation of preliminary screening analysis, tagging notes to cases, and cancelling projects outside of SIR compliance.

Con Edison has also worked with the Joint Utilities to improve the interconnection process and the material available to DER developers. These implementation efforts support stakeholder needs and State clean energy goals and result in increased efficiency in the interconnection application and study processes. Specifically, the Company has re-examined the CESIR study process and provided detailed information on the screens for overvoltage, undervoltage, voltage regulator correction capability on feeders and substations, excessive regulator movements, and voltage flicker for PV. Through this effort, the Company publicly provides detailed data on the number of interconnection studies that pass CESIR screens. These improvements are anticipated to lead to a greater volume of interconnected DERs. The Company also refreshed the DER technical guidance, requirements, and cost matrices to provide up-to date-information.

Technical Guidance and Standardization

Con Edison is leveraging its experience of interconnecting DER to support ongoing learning and standardization. For example, the Company continues participating in the ITWG and IPWG and coordinating with the Joint Utilities on interconnection issues.

Since filing the 2020 DSIP, the Joint Utilities, as part of the ITWG, developed several technical documents addressing ITWG priorities, including the treatment of energy storage and clarifying and formalizing aspects of the interconnection process:

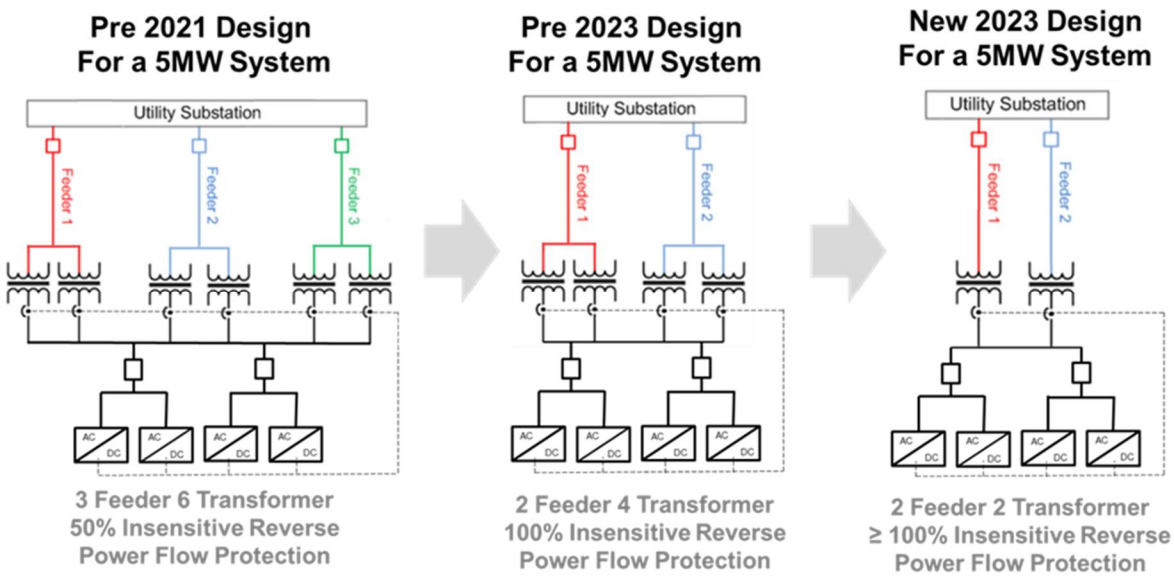
- JU Smart Inverter Frequently Asked Questions ("FAQ")
- UL 1741 SB Certified Equipment List
- Auxiliary Metering Guidelines
- Interim Solar + Storage Guidelines
- Material Modifications Guidelines
- Supporting documentation to update the preliminary and supplementary screens accordingly (e.g., network screens and voltage flicker)
- Cost-Sharing 2.0 mechanism
- Updated technical guidance matrix for integrating DER

The guidelines above are available on the DPS' DG website.[202] In addition, Company-specific guidelines on costs (including costs to perform CESIRs), requirements for the high-tension non-network distribution system, and smart inverter and synchronous machine settings are available on Con Edison's website.[203]

The Company is actively engaged in interconnecting customers of all configurations across all circuit topologies (radial, loops, underground networked, 4kV grids, etc.). Customer interconnections range from developing unique microgrid designs and associated specifications, installing EVSE and piloting V2G, and interconnecting solar and energy facilities of all sizes, both standalone and hybrid.

The company has developed and implemented a dynamic curtailment protection scheme using local SCADA communications and hardwire connections. By monitoring the network protector's open/close operation, the system will appropriately curtail the DER. This allows for more DER to interconnect at the site, and reduces the export based on system conditions. Additionally, the Company has continued to evolve its design standards to lower the cost for DER interconnections by increasing infrastructure utilization for projects connecting to the underground system under the SIR. Through a new protection scheme that employs SCADA communication with new logic for protective relays, the same DER capacity can be accommodated with fewer transformers. By adjusting the reverse power flow settings, this design enables the DER system to fully utilize the transformer capacity. Con Edison's evolution in interconnection design is shown in Figure 35. The Company is also in the late stages of developing a first-of a kind vacuum recloser switch to enable high tension interconnections to 33 kV wye grounded systems prevalent in Staten Island.

Figure 35: Evolution of DER Interconnection Designs to Provide System Protection with Reduced Infrastructure Costs



[202] Department of Public Service Distributed Generation website: http://www3.dps.ny.gov/W/PSCWeb.nsf/All/DCF68EFCA391AD6085257687006F396B?OpenDocument.
[203] Con Edison Guides and Specifications for Private Generation: https://www.coned.com/en/save-money/using-private-generation-energy-sources/specifications-for-private-generation.

DER Interconnection Data Sharing

The DER landscape remains vital to achieving the State's clean energy objectives as outlined in the CLCPA.[204] The necessity for more granular and useful energy data has accompanied the surge of interconnections, particularly serving as an input for the State's centralized IEDR platform discussed in **Section 2.8**. Additionally, the Company launched the publicly accessible Clean Energy Update[205] in 2022, which provides a quarterly update and tracks the deployment of solar, battery storage, EVs and charging stations, and clean heat projects, giving customers access to more information on renewable information progress.

Future Implementation and Planning

Summary of Future Actions

- Continue adapting the interconnection process to accommodate new technologies and configurations.
- Refine the interconnection process through ongoing innovations in the PowerClerk® Platform.
- Continue to engage with Company-specific focus groups and JU-led working groups (e.g., ITWG and IPWG) to receive feedback and provide technical guidance on upcoming topics like smart inverters, seasonal protection, and flexible interconnection technologies.
- Participate in EPRI P174 working group (DER Integration Working Group) on interconnection issues with projects that assess interface devices, analytics, system studies, monitoring, special applications, and maintenance for effective interconnection and integrated operation of distributed generation resources.
- Continue developing enabling technologies to further decrease interconnection costs and facilitate additional dynamic modes of operation.

Con Edison's future efforts focus on adapting the interconnection process to accommodate new technologies such as energy storage, and continuously refining the interconnection process through innovations in the PowerClerk® platform (as available and permitted by the SIR), internal process reviews, and ongoing dialogue with developers. For instance, the Company is developing a PSN-4 case type that will streamline the process for larger projects greater than 5 MW. The Company will also develop a case type to better track and manage V2G applications.

Additionally, the SIR is expected to continue to evolve as interconnection applications increase, further experience is gained, and utility and developer needs evolve. Potential modifications to the SIR are vetted through the ITWG and IPWG forums. Con Edison and the Joint Utilities will remain engaged with these working groups on upcoming items, including defining and reviewing flexible interconnection technologies, smart inverters, and seasonal protection. Similar to the technical decisions developed for anti-islanding and M&C, the ITWG will post future requirements online.

Distributed energy resources remain critical in meeting New York's carbon reduction goals while providing direct benefits to the public, including greater customer choice for energy supply, reductions in line loss and congestion, decreased reliance on local gas generation, and local economic development. The integration of the PowerClerk® IOAP with the Company's DERMS (see **Section 2.3** for further information) will provide an important source of DER asset information. The data generated by DER assets can also enable consumers to participate more proactively in the wholesale energy market. Additionally, the data will serve as an enabler of IEDR use cases.

[204] Note 11, *supra*.
[205] The Clean Energy Update is available at: https://www.coned.com/en/about-us/media-center/clean-energy-update.

Risks and Mitigation

As noted above, Phase 3 of the IOAP Roadmap involves automating all processes capable of automation and integrating the interconnection process into the broader distribution system planning process. One factor that could affect this timing is the technical issue of creating the system integration and functionality necessary to automate all processes fully. Another potential issue is the ability of automated processes to provide the same assurance that the interconnected equipment will not impact system reliability or safety. Finally, changes to IOAP technical screens may affect the timeline of automation improvements.

Increasing complexity of studies is another potential risk. As the type and number of energy storage use cases that the JU are required to study in the CESIR process increases, the complexity of the CESIR study process may also increase. To mitigate this risk, the JU may need to develop new procedures to verify ESS settings and control schemes, and ensure these are appropriately documented and readily available to stakeholders.

Stakeholder Interface

Con Edison will continue to engage as part of the IPWG and ITWG and seek regular developer feedback on the interconnection process and tools and develop SIR revisions. As part of the ITWG, the Company's role is to help promote consistent standards across the utilities to address technical concerns affecting the DG community and interconnection procedures. Through work with the Joint Utilities, working groups, and industry researchers, the Company has shared CESIR study methods, amended voltage flicker calculations, developed a technical report on effective grounding practices and policies, and formed a voltage regulator subgroup to investigate voltage regulator tap movements in the presence of DER. Additionally, Con Edison continues to support the IPWG by exploring non-technical issues related to the processes and policies relevant to the interconnection of DG in New York.

The Company annually convenes a developer's focus group to solicit feedback from developers and considers more frequent informal sessions to address emerging issues. The Company also supports a Distributed Generation Developer's Workshop, typically on an annual basis, separately from the CUNY workshop held in the spring.

In July 2022, Con Edison hosted a DG Developers Workshop to share updates on Cost-Sharing 2.0, SIR revisions, tariff updates, and NWS, among other topics. The Company also invited developers to provide feedback based on their ongoing experience with the interconnection process.

Continued collaboration will help Con Edison continue to identify and implement improvements. The Company is constantly reviewing opportunities to incorporate developer feedback into PowerClerk® and Customer Project Manager System ("CPMS") functionality and updates the developer community on these improvements via periodic webinars and meetings hosted by Con Edison, and interconnection related working groups.

Con Edison also partners with other organizations to reach a broad audience on issues relevant to interconnection. For example, in December 2022, the Company hosted the fourth annual Con Edison Energy Storage Day in partnership with NY-BEST. This event focuses on opportunities for energy storage installers, vendors, and project developers interested in developing energy storage in the Company's service territory.

Additional Detail

This section responds to the questions specific to DER interconnections.

1) **Describe in detail (including the web URL) the web portal that provides efficient and timely support for DER developers' interconnection applications.**

Con Edison maintains a dedicated website for customers applying for interconnection of private generation resources, which provides the necessary resources for DER interconnection applications.[206] This web portal offers links to appropriate forms and documentation according to the DG size thresholds in the SIR. In addition to the necessary interconnection application documentation and guidelines, the website provides example materials, such as a copy of the customer authorization letter, standardized contract, and the DG documentation checklist. The DG application portal, PowerClerk®, provides links to reference materials and a tutorial on how to use the PowerClerk® portal, as well as contact information for the appropriate parties at Con Edison to address any questions or concerns.

2) **Describe where, how, and when the utility will implement and maintain a resource where DER developers and other stakeholders with appropriate access controls can readily access, navigate, view, sort, filter, and download up-to-date information about all DER interconnections in the utility's system. The resource should provide the following information for each DER interconnection:**

   a. **DER type, size, and location;**
   b. **DER developer;**
   c. **DER owner;**
   d. **DER operator;**
   e. **the connected substation, circuit, phase, and tap;**
   f. **the DER's remote monitoring, measurement, and control capabilities; and**
   g. **the DER's primary and secondary (where applicable) purposes; and,**
   h. **the DER's current interconnection status (operational, construction in-progress, construction scheduled, or interconnection requested) and its actual/planned in-service date.**

The Commission website includes a range of information on DER interconnections and is updated monthly.[207] The information currently available on the Commission's website consists of the following:

- DER type and size
- DER developer
- Connected substation and circuit
- DER's current interconnection status (operational, construction in-progress, construction scheduled, or interconnection requested)
- Actual in-service date

Each of the Joint Utilities provides the following information to DPS on a monthly basis: DER location, owner, and operator via an SIR inventory report. Due to customer privacy and competitive development concerns, the utilities file redacted and unredacted versions of the report, with only the redacted version posted online. Each utility does not generally collect information regarding phase and tap, DER's remote monitoring, measurement, and control capabilities and DER's primary and secondary purpose(s) during the interconnection process. The Company is open to exploring collecting and disclosing additional information, with appropriate customer consent, if requested by developers and other stakeholders.

[206] Con Edison Applying for Private Generation landing page: https://www.coned.com/en/save-money/using-private-generation-energy-sources/applying-for-interconnection.
[207] New York State Public Service Commission Distributed Generation landing page: https://dps.ny.gov/distributed-generation-information.

3) **Describe the utility's means and methods for tracking and managing its DER interconnection application process and explain how those means and methods ensure achievement of the performance timelines established in New York State's Standardized Interconnection Requirements.**

The Company's PowerClerk® system tracks the timeliness of each application by using built-in timers associated with each task in the SIR to track the progress of an application and generate automatic reminder emails if an application appears pending, which alerts Company personnel to outstanding items. To effectively manage the application status of each interconnection relative to the SIR timelines, Con Edison also maintains an internal dashboard to track project status through each step of the SIR.

4) **Describe where, how, and when the utility will provide a resource to applicants and other appropriate stakeholders for accessing up-to-date information concerning application status and process workflows.**

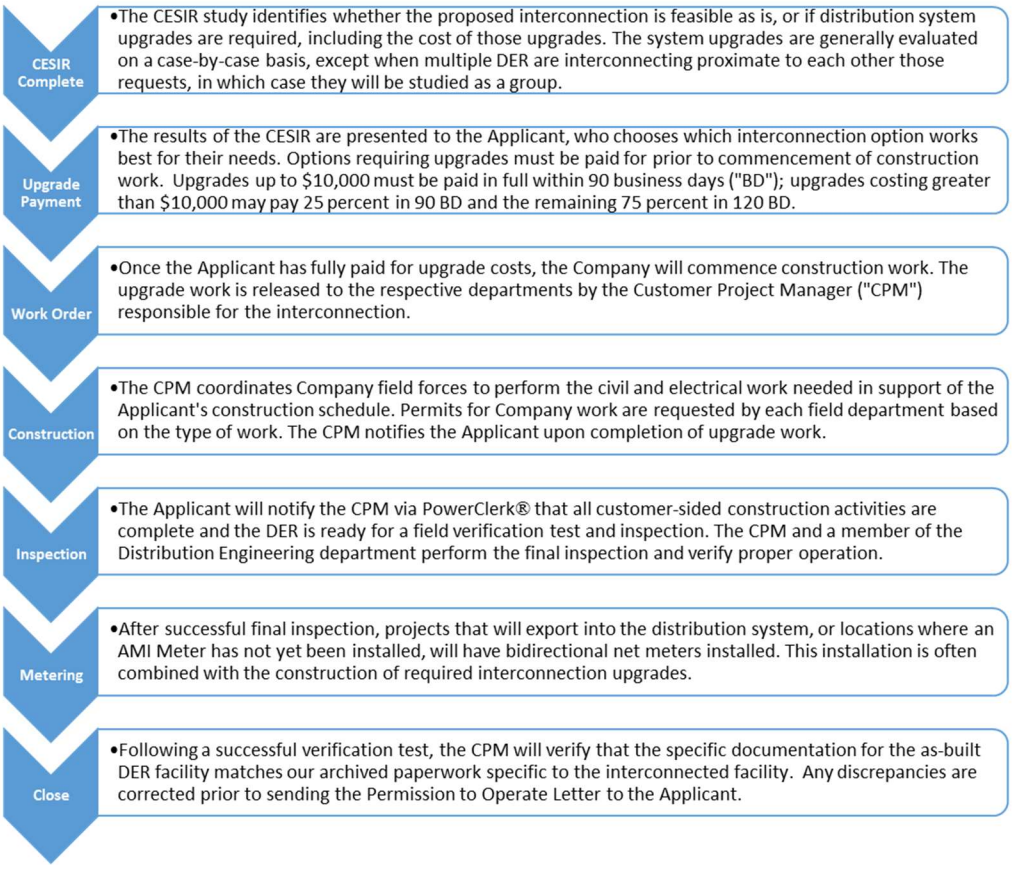
Con Edison provides up-to-date information to applicants via the IOAP and PowerClerk®. The IOAP offers greater accessibility and transparency and is more user-friendly for applicants seeking information on their current application status. General process workflows are on the Company's interconnection web portal.[208] Con Edison limits the sharing of details of specific applications and their application status to the applicant to protect privacy.

5) **Describe the utility's processes, resources, and standards for constructing approved DER interconnections.**

The Company manages construction for interconnections requiring upgrades to the utility system. This could include creating a new service for FTM-type interconnections, upgrading service for increased hosting capacity, installing SCADA controllers to monitor and control export onto the distribution system, or upgrading network protector relays to allow for increased export onto Con Edison's secondary network distribution system. Figure 36 shows the general process.

[208] Con Edison May 2022 NYS SIR – Simplified Process Flow Chart 50kW – 5MW: https://www.coned.com/-/media/files/coned/documents/save-energy-money/using-private-generation/simplified-process-flow-chart.pdf?la=en.

Figure 36: Process for Managing Construction for Interconnection Upgrades



6) Describe the utility's means and methods used for tracking and managing construction of approved DER interconnections to ensure achievement of required performance levels.

Con Edison has identified the tracking and managing of system upgrades related to DER interconnection as an emerging need, driven by the increase in DER interconnections. To better coordinate DER installations with system upgrades, the Distributed Energy Services group was created to manage both the interconnection process and the system upgrades resulting from that process.

7) Describe how and when the utility will deliver and maintain its DER interconnection information to the IEDR.

Con Edison is transmitting and sharing all of its data from PowerClerk® with the IEDR. Once the Company enables key features to the IEDR site, developers will have the ability to view this data through the IEDR.

2.12. ADVANCED METERING INFRASTRUCTURE

Context and Background

On November 16, 2015, Con Edison filed a detailed business plan to deploy AMI and associated communications network and back office IT systems to manage the two-way communications enabled by AMI.[209] On March 17, 2016, the Commission approved this plan, which included the rollout of approximately 4.7 million advanced electric and natural gas meters.[210] AMI provides customers with the information necessary to help manage their energy usage, control costs, and become more active energy consumers, making informed energy decisions. The robust communications network, implemented before meter deployment, provided a critical communication link with the smart meters. It allows operators to dispatch and control specific resources as DER markets continue developing and the supporting IT infrastructure is built.

The Company also filed its AMI Customer Engagement Plan on July 29, 2016, detailing how it will engage customers and third parties and help them understand and take advantage of the benefits of investments in AMI and DCX.[211] The engagement plan activities facilitate greater customer participation in the Company's DR programs, provide for other energy management opportunities offered through innovative value-added products and services by third parties, and increase access to EE tools.

The rollout of AMI provides customers with valuable consumption information and enables more innovative pricing and demand response capabilities. This consumption information is central to several regulatory proceedings, notably the IEDR and tracking and benchmarking building EE measures related to New York City LLs 84 and 97. AMI also serves as an enabler to GBC customer-consented data sharing and new time-variant rate structures.[212]

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Successfully implemented AMI Business Plan, including installation of over 4.7 million electric and gas smart meters as of May 2023.
- Released a revised design of My Account in August 2022 based on customer feedback, improving scalability and navigation functionality.
- Implemented CVO across entire service territory as of September 2022.
- Leveraged AMI system to perform pings and on-demand reads on affected AMI meters to verify outage status and deploy crews more efficiently. Since April 2018, the Company avoided 44,566 truck rolls for false outages, resulting in fuel savings and reduced GHG emissions.

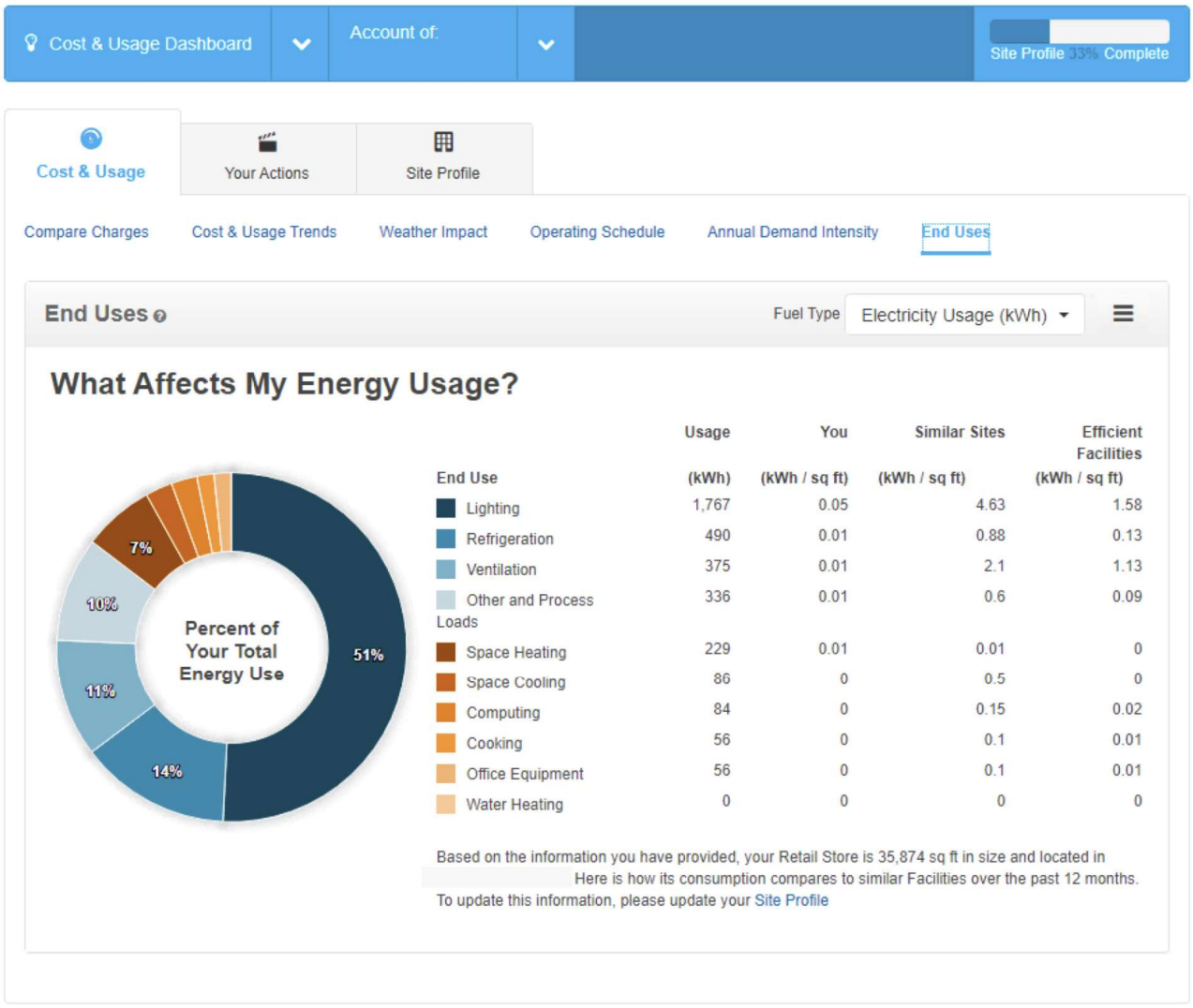
As of March 2023, Con Edison has nearly completed the installation of approximately 4.7 million meters across the Company's service territory and 21,200 communication devices. To complete the AMI rollout, the Company is now

[209] Con Edison 2015 Electric Rate Case, AMI Business Plan (filed November 16, 2015).
[210] Note 142, *supra*.
[211] Con Edison 2015 Electric Rate Case, AMI Customer Engagement Plan (filed July 29, 2016).
[212] These topics are discussed at greater length elsewhere in the document. The IEDR and GBC are discussed in **Section 2.9 – Data Sharing**, EE benchmarking and emission savings tracking are discussed in **Section 2.7 – EE Integration and Innovation**, and the Company's Innovative Pricing Pilot ("IPP") is discussed in **Section 2.10 – Billing and Compensation**.

pursuing hard-to-access locations. The near-complete rollout of AMI across the Company's customer base has provided energy consumption insights to its customers as well as efficiency benefits to the electric system.

Approximately two weeks after a customer receives an AMI meter, they get access to tools on their My Account that track energy use and identify opportunities to save. For residential customers, this includes billing and usage information, comparisons and analysis, and instructions on how to share their energy usage data with contractors and other third parties. Commercial and complex billing customers are also eligible for My Account to get access to in-depth interval data, personalized energy insights, and more. Examples of the insights available to commercial customers are shown in Figure 37, below. In 2022, the Company released a revised design of its My Account page, informed by customer feedback with improvements to the site's scalability and navigability.

Figure 37: My Account Cost and Usage Insights



End Use	Usage (kWh)	You (kWh / sq ft)	Similar Sites (kWh / sq ft)	Efficient Facilities (kWh / sq ft)
Lighting	1,767	0.05	4.63	1.58
Refrigeration	490	0.01	0.88	0.13
Ventilation	375	0.01	2.1	1.13
Other and Process Loads	336	0.01	0.6	0.09
Space Heating	229	0.01	0.01	0
Space Cooling	86	0	0.5	0
Computing	84	0	0.15	0.02
Cooking	56	0	0.1	0.01
Office Equipment	56	0	0.1	0.01
Water Heating	0	0	0	0

Con Edison's rollout of AMI continues to provide visibility into system conditions at the customer level and operational flexibility to strategically reduce targeted demand and avoid system overloads that could lead to long-term outages.

Voltage data from AMI allows the Company to optimize voltage regulation across the electric system and reduce losses in electricity. Conservation Voltage Optimization is the adjustment of area substation supply voltages to a lower value while providing adequate voltage levels for all customers. CVO reduces the amount of energy consumed by end use customers to power a given load, resulting in energy savings. The target for AMI-enabled CVO is 3.0 percent voltage reduction, which equates to approximately 1.5 percent energy savings. CVO is now enabled in all 82 of the Company's networks.

The communications network of the AMI system provides a valuable platform for monitoring sensors. In October 2018, the Company began a pilot to deploy 9,000 natural gas detectors ("NGDs") to identify concentrations of methane above a threshold of 10 percent Lower Explosive Limit ("LEL") or 0.5 percent gas-in-air. The successful testing of the pilot and the positive stakeholder feedback led to a mass deployment of NGDs, starting in September 2020. As of March 2023, the Company has installed more than 190,000 NGDs and detected more than 2,100 leaks.

AMI has enabled operational efficiencies and enhancements to outage management. The Company has been using the AMI system to perform pings and on-demand reads on affected AMI meters to verify outage status and deploy crews more efficiently. In total, the Company has avoided 44,566 truck rolls for false outages since April 2018. At the end of 2020, the Company implemented an outage validation system that leverages AMI restoration events and automatically pings meters to confirm power has been restored when customer outage tickets are closed or their status is updated to 'restored'. This system provides a better end user experience for customers by reducing the number of inaccurate restoration calls. In June 2021, the Company began leveraging this system to proactively identify nested outages and reduce reliance on customer reporting of outages. At the end of 2021, the Company implemented multiple customer outage integrations (transformer level or higher) with the OMS and System Trouble Analysis and Response ("STAR"). This integration creates tickets for multiple service electric outages automatically, resulting in reduced reliance on customer reporting and allowing the Company to better understand the full scope of any outages impacting smart meter customers. On September 29, 2022, a service filter logic enhancement was implemented and, with this new logic, only outages that affect two or more services from a structure (service box, manhole or transformer) will be sent to the OMS.

The Company has continued to improve outage management efforts through leveraging available AMI data. For example, the company has developed a cross-organization data integration with New York City Transit to send electric outage and voltage events for subway system meters in near real-time. Con Edison has also implemented a custom dashboard system that allows operators to monitor real time power status of various critical customer types. This system can be configured to provide push email notification when an outage occurs. Additionally, the Company has created a surgical load-shedding system that leverages the AMI remote disconnect functionality to reduce load during a system emergency. This system can be leveraged during an emergency to prevent a cascading network failure or a variety of other overload conditions.

Summary of Future Actions

- Refine the value-added features enabled by AMI, including outage notifications, high bill alerts, enhanced customer data sharing, and pricing pilots.
- Continue to deploy NGDs and investigate opportunities to deploy additional value-added sensors on the AMI network as the need arises.
- Continue to improve access to AMI data to add value to end-use organizations (i.e., control centers, engineering, and others).
- Collaborate with the IEDR use case stakeholders to provide energy consumption and customer billing data through AMI features supporting the IEDR Phase 2 launch.

Con Edison will complete the rollout of all AMI meters by the end of 2023. The Company plans to continue the deployment of NGDs through 2025 and will also continue to monitor other value-add technology solutions that the AMI network can enable.

As deployment of AMI meters completes, the Company's focus shifts to value-add features and optimal use of the data produced by AMI meters. The Company will continue its customer education and stakeholder interface efforts, which it will account for in future account access interfaces. Additionally, the Company will perform software enhancements from 2023-2025 to improve data connectivity across information systems and optimize for additional processing needs.

The Company will continue to find new ways to innovate and leverage AMI data to improve its core business. The Company anticipates this to continue well beyond the completion of AMI rollout. Con Edison plans to create an additional enhancement to the AMI-OMS integration to leverage AMI restoration data to automatically close tickets that no longer require company attention. This technology will reduce the burden on operators and allow them to maintain focus on restoring customers as quickly as possible. Additionally, the Company plans to build a system that leverages AI technology and AMI data to aggressively locate and identify power signatures of unreported customer-sited solar or other DG installations, as well as EV chargers or electric heating systems. This technology will further ensure that the system operates at peak efficiency.

AMI Business Analytics

The goal of this project, launched in May 2022, is to design and deploy a suite of data analytics use cases to assess customer load profiles and patterns, leveraging the Company's AMI data and other internal and external data sources. Through this integrated application, Con Edison will build predictive insights into specific customer trends, reconciliation of weather-adjusted peaks of the electric and gas systems, and uptake of load-modifying technologies. Additionally, AMI Business Analytics will assist the system planning process, which is designed to identify current and future operating requirements, risks, and potential solutions to provide safe, reliable, and resilient systems.

The AMI Business Analytics project will leverage the EDAP, to provide information needed for use cases. The program will identify additional analytics to be performed on the data already existing in EDAP, and also integrate new data sources to unlock additional insights and deliver new analytics use cases. These use cases will focus on data integration for customers employing emerging technologies such as EV, heat pumps, DERs, and other systems incentivized by policies like the CLCPA and New York City's LL97.

Con Edison's AMI Business Analytics project will help enhance a variety of functions, including the integration of AMI data into the existing forecasting process flow, consolidation of data sources into a single platform, planning for future needs that support clean energy targets, and the continued pursuit of automation tools and advanced analytics.

The Company will also continue its efforts with the IEDR, described in greater detail in Section 2.8. Advanced metering data will be shared under the appropriate consent and privacy standards.

Risks and Mitigation

Con Edison deployed AMI in four logical phases to reduce planning complexity and maximize project control. The Company continues to leverage best practices to provide an optimal customer experience and reduce operational risk as it completes the deployment of AMI meters. Residual levels of risk for ongoing operations and maintenance and the development of complementary features are monitored closely by the Company. Environmental risks, such as severe storms, could affect meters and local network performance.

Stakeholder Interface

As noted above, the Company filed a Customer Engagement Plan describing a range of activities to raise awareness of the benefits of AMI and address customer questions and concerns. [213] To date, Con Edison has informed all customers in its service territory on AMI implementation. Approximately 50,000 customers in the Company's service territory do not have smart meters, primarily due to lack of vendor install access.

For DER developers, GBC facilitates sharing more granular data from AMI through an automated process in a machine-readable format, supporting developers' business planning, marketing, and project scoping. Additionally, the Company has seen a substantial increase in residential customers participating in DR programs.

Additional Detail

This section responds to the questions specific to AMI.

1) **Provide a summary of the most up-to-date AMI implementation plans, including where AMI has been deployed to date.**

The AMI Order approved the Company's proposal to deploy 4,715,000 smart meters across its service territory between 2017 and 2023.[214] As of March 2023, Con Edison has deployed approximately 4,729,276 electric and gas smart meters, representing over 98 percent of total deployment. AMI meter installation began in June 2017 for new business customers and business-as-usual replacements. AMI mass deployment is completed and the Company will continue to work with its customers and vendors where access issues or, in some instances obstructions, have prevented the mass deployment vendor from installing the meter in spite of making in most cases more than five attempts. Table 20 shows the current AMI communications network and meter deployment schedule:

[213] Note 211, *supra*.
[214] Case 19-E-0065, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Con Edison AMI Metrics Report (May 1, 2023).

Table 20: AMI Meter Deployments by Region (Initial Target versus Actual Number)

Phase	Region	Initial Meter Deployment Target	Actual Number of Meters Deployed
1	Staten Island	182,000	187,810
2	Westchester	605,000	614,900
3	Brooklyn	988,000	1,034,874
	Bronx	787,000	786,590
4	Manhattan	1,144,000	1,080,772
	Queens	1,009,000	1,024,330

2) Provide a summary of all new capabilities that AMI has enabled to date, and how these capabilities benefit customers, including, as applicable, customer engagement, energy efficiency, and innovative rates.

As discussed above, AMI enables the delivery of personalized energy consumption insights through the My Account portal, as well as operational efficiencies such as CVO, outage management enhancements, and the deployment of NGDs to improve public safety. The Company has developed load shed capabilities and tools, which can isolate portions of the network if or when issues occur within the local distribution system.

3) Describe the AMI-acquired data and information that is planned to be available through the IEDR.

The Company will be providing AMI data to the IEDR, such as 15-minute utility customer energy consumption data, day after, and 12-month historic data, pending the results of the Commission's petition on data sharing and a Memorandum of Understanding ("MOU") with the IEDR Developer. Once Con Edison receives confirmation of the petition and MOU, the Company will highlight technical details associated with AMI-acquired data and information planned for use through the IEDR.

4) Describe where and how DER developers, customers, and other stakeholders can access up-to-date information about the locations and capabilities of existing and planned smart meters.

The Company continues to communicate the benefits of AMI to customers proactively. Additionally, the AMI rollout plan is publicly available through the Company's website[215] and was promoted through extensive outreach activities, as described in previous sections.

5) Provide a summary of plans and timelines for future expansion and/or enhancement of AMI functions.

As discussed above, the Company plans to incorporate software enhancements, a complete hardware refresh, and implementation of AMI Business Analytics as part of the 2022 rate case. Software enhancements include upgrades to

[215] Con Edison Smart Meters website: https://www.coned.com/en/our-energy-future/technology-innovation/smart-meters.

the Meter Data Management System ("MDMS"), Meter Asset Management System ("MAMS"), and Profiled Encore smart meter installation and support application starting in 2024.

The Company began work on the AMI Business Analytics application in March 2022 and anticipates an estimated in-service date of December 2025. Under AMI Business Analytics, Con Edison will assess customer load profiles and patterns, leveraging the Company's AMI data and other internal and external data sources, ultimately enhancing a variety of reporting analytics.

6) **Describe where and how each type of AMI-acquired data is stored, managed, and shared with, and used by other utility information systems such as those used for billing/compensation, customer service, work management, asset management, grid planning, and grid operations.**

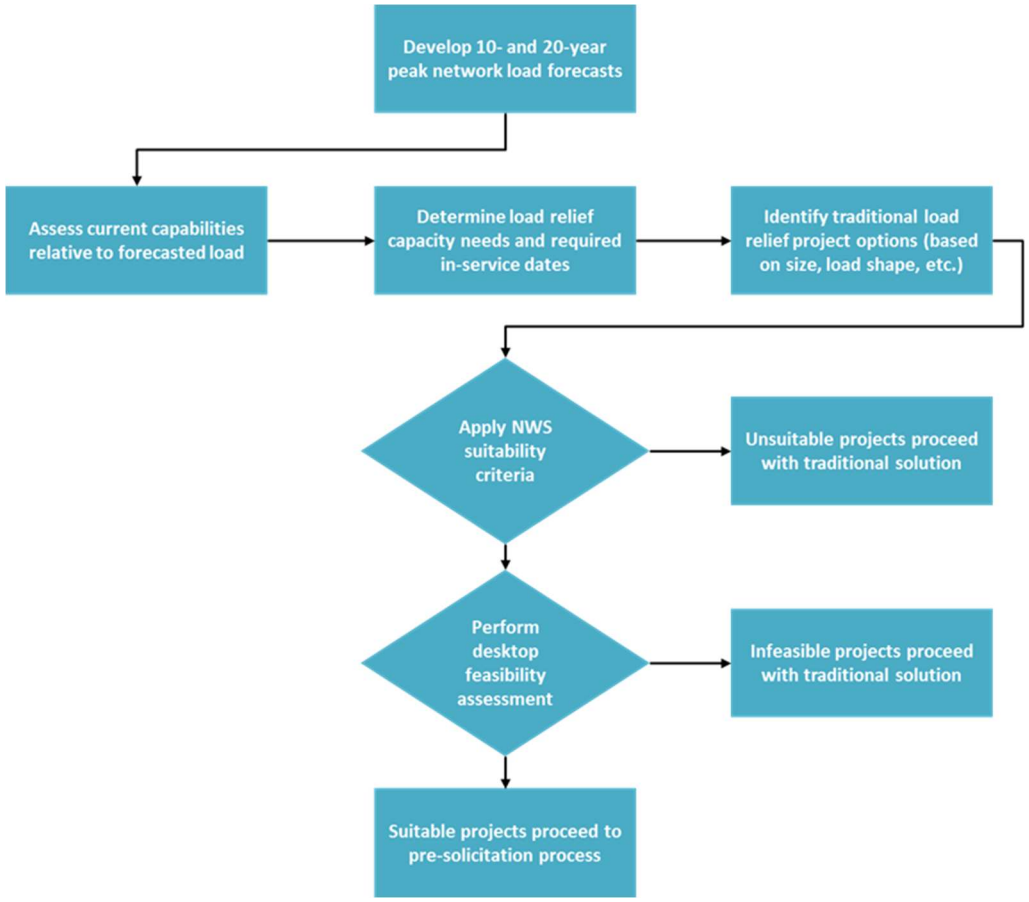
AMI Interval data is measured and collected every 5 or 15 minutes (depending upon meter/customer type). Interval data is collected and stored in the AMI Head End System ("HES") for a period of 45 days. Every 15 minutes, interval data is sent to the MDMS where it is stored for 24 months. Long-term AMI data is stored in the Company's EDAP. Currently, all meter data is retained permanently. Data is shared with other systems through various integrations with HES, MDMS and/or EDAP, depending upon the data requirements. Meter trap event data is collected and transmitted in real-time and stored in the same locations.

2.13. BENEFICIAL LOCATIONS FOR DERS AND NON-WIRES ALTERNATIVES

Context and Background

Beneficial locations are locations where there is a potential for localized DER deployment to address projected system needs, specifically for load relief, and defer or avoid traditional utility infrastructure investments.[216] Beneficial locations are generally identified through the Company's capital budgeting process. Company planners use load flow modeling, network reliability modeling, and modeling of system performance to assess the current capability of existing distribution and substation assets to meet the forecasted load based on the design criteria, type of asset, thermal ratings, and local power factors. For assets that are determined to be at risk of becoming overloaded during system peak conditions and under various contingencies, traditional and possibly NWS load relief project options are identified to mitigate the deficiency[217] Figure 38 provides a simplified diagram of the NWS identification steps within the capital planning process.

Figure 38: NWS Identification in Capital Planning Process



[216] Note 18, *supra*, p. 40.

[217] Other areas of system need identified through distribution modeling include risk reduction programs, new business projects to interconnect new customers, storm hardening or resiliency projects, emergency response and replacement, IT solutions to meet strategic business needs, and public works projects to re-route Company equipment due to municipal right-of-way.

The feasibility assessment is a new step in the process. This desktop analysis evaluates customer demographics across customer segments, customer energy consumption patterns, and the potential for load management from EE, DERs, and other NWS projects. It also estimates costs based on previous NWS RFPs. As shown above, suitable and feasible projects are advanced to the solicitation process, where the need is defined in terms of the total MW of load relief required to replace the traditional capacity, the applicable time of day the load relief must be available, and the in-service date(s). This information, along with additional demographic information and project-specific detail, is included in the NWS solicitation. Based on responses, the Company evaluates the viability of implementing an NWS portfolio to meet the MW needs within the required timeframe and conducts a benefit-cost analysis informed by the BCA Handbook.[218]

If the Company can assemble a feasible portfolio to meet the MW need and the NWS passes the Societal Cost Test ("SCT") in the BCA, the Company procures the necessary solutions, files the BCA results, and begins implementation. If the Company is unable to assemble a feasible portfolio of cost-effective solutions, the Company pursues a traditional solution.

Con Edison's approach to NWS has been informed through its experience and a series of regulatory orders. In 2014, the Commission issued its Order approving Con Edison's BQDM Program.[219] The BQDM Program set the necessary conditions to establish a framework for the Company's evolution of the Targeted Demand Management Program ("TDM"), which would target networks reaching capacity due to increasing demand. In December 2015, the Commission approved the TDM Program, allowing the Company to implement load relief in targeted areas through customer-side solutions when it would cost-effectively enable deferral of new infrastructure investments.[220]

The Company's approach to NWS has continued to evolve based on experience with the BQDM Program and other needs. Based upon the BQDM Program's success, the Commission approved the Company's petitions to extend the BQDM Program beyond 2018[221] and obtain additional demand reductions beyond 2018 without additional funding.[222]

NWS has become a core business function within the capital planning process and remains an essential mechanism for bringing DER onto the system. Non-wires solutions continues to offer opportunities for developers to propose innovative solutions to meet a clearly defined system need while delivering customer and environmental benefits. To date, market response has been strong, with many proposals testing novel concepts and incorporating advanced technologies. Con Edison continues to learn from its experiences and the collective experience of the Joint Utilities and is pursuing creative options to expand opportunities for NWS.

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[218] The Company's BCA Handbook was filed concurrently with the DSIP under Case 16-M-0411, *In the Matter of Distributed System Implementation Plans*, Con Edison Electric BCA Handbook v4.0 (filed on June 30, 2023): https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=16-M-0411.

[219] Case 14-E-0302, *Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn Queens Demand Management Program* ("BQDM Petition Proceeding"), Order Establishing Brooklyn/Queens Demand Management Program (issued December 12, 2014).

[220] Case 14-E-0302, *Petition of Consolidated Edison Company of New York, Inc. for Implementation of Projects and Programs that Support Reforming the Energy Vision*, Order Implementing With Modification the Targeted Demand Management Program, Cost Recovery, and Incentives (December 17, 2015).

[221] BQDM Petition Proceeding, Petition for Extension of Time to Implement Brooklyn Queens Demand Management Program (filed January 19, 2017).

[222] BQDM Petition Proceeding, Order Extending Brooklyn/Queens Demand Management Program ("Extension Order") (issued July 13, 2017).

Implementation Plan, Schedule, and Investments

Current Progress

Summary of Achievements

- Continued to implement portfolios to defer traditional solutions in Newtown and BQDM.
- Completed the implementation of the Water Street Program in 2023.
- Launched Prescriptive Energy Storage Program to target additional projected overloads in BQDM territory.
- Released RFP to address projected overload in Jamaica substation area.
- Added a new project step for post-suitability feasibility assessment in the NWS solicitation process, enhancing cost-effective solutions in an appropriate timeframe.
- Shared information on beneficial locations by: (1) supplying information on past, present, and expected future NWS solicitations on the Company's website, the Joint Utilities' website, and REV Connect, and (2) displaying NWS target areas and LSRV zones as part of the Company's hosting capacity maps.

NWS Market Opportunities

Con Edison has continued to identify opportunities for NWS, bring those opportunities to the market, and work to implement portfolios assembled around these opportunities. Since the 2020 DSIP, the Company has continued to implement programs in the Newtown, Water Street, and BQDM areas. The Company has also identified a need for the Jamaica substation area and issued an RFP. Finally, the Company continues to evaluate and refine its BQDM project, launching a prescriptive ESS incentive in that area.

Newtown Load Transfer Project

The Company released two RFPs to defer or eliminate a traditional solution identified for the Newtown area substation. The traditional solution included a load transfer implemented by 2021 to relieve projected forecast constraints on the Newtown area substation and the sub-transmission feeders supplying the substation. The first RFP was released July 6, 2018, with an energy-storage specific solicitation announced June 14, 2019. From these RFP responses, the Company developed a portfolio of customer-side solutions with EE and ESS that defer the traditional solution.

The Company began implementing adders to its EE programs in late 2019 and will continue those programs through 2024 in addition to working with developers to install contracted energy storage expected to be operational in 2024. The Company is implementing customer-sided load relief to defer the traditional solution through 2026.

Water Street Cooling Project

The Company completed implementation of a portfolio to meet the combined load relief needs of the Water Street and Plymouth Street substations. This portfolio required load relief between the summer of 2019 and the summer of 2021. The Company achieved this load relief through EE adder programs, DG, and ESS.

Jamaica Substation Project

In March 2023, Con Edison issued an RFP seeking load relief solutions for the area served by the Jamaica substation in Queens. Based on Company analysis, to eliminate the need for traditional load relief solutions, the Jamaica network will load relief as soon as 2026. Qualified and experienced vendors with the capability to deliver DER solutions and

customer-sited Power Factor Correction ("PFC") that provide sub-T&D system load relief through the NWS Program were encouraged to apply. The Company seeks to procure CSS to provide load relief as early as 2023. Con Edison closed the RFP in May 2023 and is evaluating submissions.

BQDM

The Company continued implementing a portfolio of customer-side EE, distributed generation, and energy storage technologies to reduce peak demand in the BQDM targeted area. In 2022, Company launched the BQDM Prescriptive Energy Storage Incentive Offering to provide additional load relief by summer 2026. The program offers incentives for grid-connected systems and load-following systems. The program will have a rolling application period, with a "first come-first reviewed" queue through December 2023 or until the MW cap is reached.[223]

Best Practices and Process Improvements

Developing and managing solicitations has provided valuable experience that is being leveraged to refine the Company's internal operating procedures and improve the solicitation process for developers and third parties. Process improvements included:

- Added a new project step for post-suitability feasibility assessment in the NWS solicitation process.
- Designed prescriptive energy storage program to address identified gaps in market.
    - Creating two separate incentive streams for FTM and BTM with a higher incentive rate for BTM necessary to drive market enablement – encouraging vendors to work with customers for load management while de-risking use cases.
    - Discontinuing revenue sharing requirement with the Company for any additional revenue streams – developer maintains 100 percent.
    - Engaging projects later in the development process to increase project certainty – contracts are awarded after paying 100 percent of the interconnection costs.
    - Increasing lead time for project development
- Collaborated with AHJs to streamline permitting for ESS
- Conducted market studies to expand incentive offerings for new EE technology types

While it is possible to standardize many of the NWS procedures, Con Edison has observed that each NWS is unique in terms of size, nature of the need, and the types of technology solutions to be evaluated, which is driving continued learning. For example, the Company has created internal processes to help develop and analyze portfolios quicker, improving portfolio and BCA analysis tools to analyze suitable NWS solutions more quickly and identify cost-effective portfolios.

Additionally, the Joint Utilities' DER Sourcing Working Group has continued to meet on a bi-weekly basis to share lessons learned and discuss solicitation and contracting topics, including but not limited to availability and potential use of utility property and interconnection cost treatment, contract language regarding DER participation in multiple revenue streams, and commercial and performance requirements and non-performance issues of NWS contracts.

As noted above, the annual capital budgeting process results in the identification of system needs, including projects needed to provide load relief. Con Edison reviews projects in the 10-year load relief program to determine if an NWS has the potential to defer or avoid the capital project using the Company's NWS suitability criteria and feasibility assessment.

[223] The latest information on available incentives and activity with the BQDM project is available in docket 14-E-0302.

The suitability criteria are reviewed annually and will be updated as appropriate as experience is gained through procurement and subsequent DER performance. Ongoing experience in the initial phases of NWS solicitations suggests the suitability criteria generally work well and effectively direct developers to high-potential opportunities. Many of the solicitations have provided adequate options to construct viable portfolios of market solutions for projects satisfying the suitability criteria.

Con Edison issues competitive market solicitations for projects meeting the criteria to further evaluate viable NWS portfolios. Those solicitations that have not resulted in viable portfolios have also been instructive and helped the Company better understand the real-world challenges of procuring and implementing NWS portfolios. For example, the Company's experience with solicitations for primary network feeder relief projects, where dilution of load relief in a network distribution system affects the viability of a NWS portfolio, provides evidence that lower-cost traditional projects can challenge the economics of NWS and the ability to assemble a sufficient portfolio of projects.

Future Implementation and Planning

Summary of Future Actions

- Continue exploring new project opportunities for projected system needs of load relief through NWS solutions.
- Pursue refinements to the feasibility assessment that help provide cost-effective solutions in an appropriate timeframe as part of the NWS identification in the capital planning process.
- Continue ongoing enhancements to the solicitation process incorporating lessons learned.
- Continue to implement existing NWS portfolios.
- Improve and refine EE adder and ESS programs.

The Company will continue to identify beneficial locations through the capital planning process and direct developers to these locations through RFPs, as well as the NWS layer of the Company's hosting capacity maps. Additionally, the Company will continue to explore opportunities to leverage its existing utility programs to meet localized system needs.

With continued stakeholder dialogue, sharing experiences within the JU, and ongoing experience through present and future rounds of NWS solicitations, the Company expects to further refine and improve the efficiency of its solicitation process. The Joint Utilities continue to share experiences and lessons learned to achieve a consistent set of best practices and improve the solicitation processes to be more efficient and user-friendly. This includes reviewing the NWS suitability criteria as part of the annual planning process and evolving how NWS can address those needs.

Risks and Mitigation

Identifying beneficial locations and potential NWS candidates is integrated into the annual planning process. The risks around beneficial locations relate more to the dynamic nature of the grid and changes in system needs, often driven by factors outside of the Company's control.

Year-over-year adjustments in anticipated customer loads and resulting annual forecasts have proven challenging in ensuring successful NWS projects. Changes in annual load forecasting can shift the load relief needs, require an agile

approach to portfolio development and implementation.[224] Balancing the necessary lead time required to identify, solicit, and implement an NWS portfolio against potential changes in load relief needs is an area the Company continues to manage and identify best practices that can improve internal planning processes.

Additionally, supply chain disruptions to the technologies that comprise NWS portfolios can interfere with lead time and implementation timelines. For example, supply chain disruptions to energy storage due to COVID-19 significantly impacted the implementation strategy for the water street portfolio.

Changes to the policies for valuing DER in beneficial locations could impact the Company's processes, necessitating changes in the identification of beneficial locations. To mitigate this risk, the Company will collaborate with key stakeholders to identify any such situation and plan to address any issues or concerns as they arise. In addition, changes to BCA requirements (e.g., impacting calculation methodology/components) could also change the nature of which potential NWS projects are selected and the Company's process for selecting them. To mitigate this risk, Con Edison will continue to evaluate how changes to the BCA may impact portfolio make-up and will work with the JU to share best practices on NWS procurement and implementation processes.

Stakeholder Interface

Con Edison will continue engaging stakeholders through the relevant Joint Utilities working groups, including a focus on DER Sourcing and NWS, Hosting Capacity, Forecasting, and VDER Value Stack. On a more direct level, the Company will continue one-on-one and group communications with NWS bidders to identify opportunities for enhancements in future NWS solicitations.

The Company holds regular Distributed Generation Developers' Workshop to solicit developer feedback, with NWS among the topics covered. The Company also participates in NY-BEST Energy Storage Day to discuss a range of NWS topics. The Company additionally hosts webinars for interested groups at the launch of new programs, for the BQDM prescriptive energy storage program in July 2022, and the Jamaica Network Program in March 2023.

The Company's ongoing presence and strong relationships with stakeholders in NWS areas facilitate the ability to convene formal and informal meetings with local stakeholders. Depending on the type of program implemented, the stakeholders may include elected officials, local chambers of commerce, business improvement districts, local development corporations, not-for-profit community-based organizations, government entities such as community boards and the New York City Housing Authority ("NYCHA"), community housing associations, block associations, and tenant associations.

The Company also continues to provide quarterly updates on NWS and BQDM implementation, as well as annual implementation plans. Through these filings, the Company presents project-specific updates on the system need, load relief procured to date, and expenditures, as well as future planned implementation.

Additional Details

This section responds to the questions specific to beneficial locations for DER and NWS.

[224] For instance, in the Parkchester NWS opportunity, the load relief need decreased and shifted later in the 10-year load relief plan, beyond the suitability criteria. The Water Street portfolio also experienced a material reduction in need leading to an earlier close-out of this program.

1) **Describe where and how developers and other stakeholders can access resources for:**

   a. **accessing up-to-date information about beneficial locations for DERs and/or energy efficiency measures; and**

The Company posts information about past and present NWS solicitations and programs on its website,[225] on the Joint Utilities' website, [226] and through REV Connect. [227] Information on beneficial locations can also be accessed through the hosting capacity map, where developers view if an address is within the boundaries of an existing NWS.[228]

   b. **efficiently sorting and filtering locations by the type(s) of capability needed, the timing and amount of each needed capability, the type(s) and value of desired benefit, the serving substation, the circuit, and the geographic area.**

As noted in response to "1a)" above, the Company shares information on beneficial locations targeted for NWS through its NWS website and hosting capacity map. The NWS solicitations posted on the Company's website provide extensive detail on the system capability needed, the timing and amount of each needed capability, the serving substation and/or circuit, and the geographic area. The NWS solicitations also provide customer demographic information, including annualized consumption and peak and average billing demand.

2) **Describe the means and methods for identifying and evaluating locations in the distribution system where:**

   a. **an NWA comprising one or more DERs and/or energy efficiency measures could timely reduce, delay, or eliminate the need for upgrading distribution infrastructure and/or materially benefit distribution system reliability, efficiency, and/or operations; and/or,**

The Company's capital budgeting approach seeks to identify the investments needed to meet customer expectations for safe and reliable service while moderating impacts to the customer bill. Con Edison initiates its annual planning cycle immediately following the summer operating period with the development of forecasts and identification of load relief needs. Planning continues over the next several months with the identification of risk reduction, new business, and other system investments culminating in a proposed capital work plan for the next five-year period. The proposed CIP, available internally in May, continues to undergo an iterative review and optimization process lasting up to six months, during which time projects may be added or deleted based on evolving system needs and priorities. The plan receives formal corporate approval and becomes the final CIP in November, which is then filed with the Commission the following February.[229] During the capital planning process, Company planners use load flow modeling, network reliability modeling, and modeling of system performance to assess the current capability of existing distribution and substation assets to meet the forecasted load, based on the design criteria, type of asset, thermal ratings, and local power factors. For assets that are determined to be at risk of becoming overloaded during system peak conditions and under various contingencies, multiple load relief project options are identified to mitigate the overload.

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[225] Con Edison Non-Wires Solutions website: https://www.coned.com/en/business-partners/business-opportunities/non-wires-solutions.
[226] Joint Utilities website: http://jointutilitiesofny.org/utility-specific-pages/.
[227] REV Connect NWS website: https://nyrevconnect.com/non-wires-alternatives/.
[228] Note 39, *supra*.
[229] Con Edison 2016 Electric Rate Case & Con Edison 2019 Electric Rate Case, Report on 2019 Capital Expenditures and 2020-2024 Electric Capital Forecast (filed February 28, 2020).

The Company analyzes load relief needs at an area substation and sub-transmission level over a 10-year window and up to three years for distribution-level feeders. The load relief projects (also referred to as system expansion projects) identified in the capital planning process are measured against the NWS suitability criteria to determine suitable NWS candidates. Specifically, the Company reviews the list of projects in the 10-year load relief program and determines if the project meets the NWS suitability criteria, specifically if the project: (1) is for load relief, (2) has enough lead time to pursue a NWS without foreclosing the opportunity to install a traditional solution if needed, and (3) meets the financial threshold. Table 21 presents Con Edison's current NWS suitability criteria. [230] Projects that do not meet some or all of the suitability criteria can also be evaluated as potential NWS if a sufficient need is identified.

Table 21: Con Edison NWS Suitability Criteria

Criteria	Potential Elements Addressed	
Project Type Suitability	Project types include Load Relief or Load Relief in combination with Reliability.	
Timeline Suitability	**Large Project** (Projects that are on a major circuit or substation and above)	• 36 to 60 months
	Small Project (Projects that are feeder level and below)	• 18 to 24 months
Cost Suitability	**Large Project** (Projects that are on a major circuit or substation and above)	• No cost floor
	Small Project (Projects that are feeder level and below)	• Greater than or equal to $450,000

For projects satisfying the criteria, the Company defines the MW need and the time of day over which the relief is required and then determines the total capacity of NWS needed to replace the traditional project(s) and defines the date(s) by which the relief is needed.

Following the identification of NWS Suitable Candidates, an assessment is conducted on each project to determine the feasibility of an NWS portfolio given the magnitude of anticipated deficiency, timing of the deficiency, and size of the service area impacted. The assessment leverages customer demographic and energy usage information, as well as historic program data to develop potential portfolio outcomes. This analysis facilitates identification of projects where NWS portfolios are infeasible and brings only viable solutions to the market.

[230] On March 1, 2017, the Joint Utilities submitted a compliance filing with individual utility-specific suitability criteria. DSIP Proceeding, Non-Wires Suitability Criteria.

Information about the capital project the Company seeks to avoid or defer is provided to the market via competitive solicitation. Based on responses, the Company evaluates the viability of implementing an NWS to meet the MW needs within the required timeframe and conducts a benefit-cost analysis informed by the BCA Handbook.

If the Company is able to assemble a feasible portfolio to meet the MW need and the NWS passes the SCT in the BCA, the Company procures the necessary solutions, files the BCA results, and begins implementation. If the Company is unable to assemble a feasible portfolio of cost-effective solutions, the Company pursues a traditional solution.

b. one or more DERs and/or energy efficiency measures including increased value-based customer incentives could reduce, delay, or eliminate the need for upgrading bulk electric system resources and/or materially benefit bulk electric system reliability, efficiency, and/or operations.

The identification of system needs at the bulk electric level follows the same process as described in the response to "2a" above. In certain instances, traditional solutions identified during the capital planning process include both bulk electric and distribution system resources. For example, the Water Street and Plymouth Street NWS solved for a traditional solution that includes upgrades required at the distribution area substation, as well as at the sub-transmission feeder supplying that substation. To date, there have been no projects that are solely dedicated to the bulk electric system and have satisfied the NWS suitability criteria.

3) Describe how the NWA procurement process works within utility time constraints while enabling DER developers to properly prepare and propose NWA solutions which can be implemented in time to serve the system need. Details should include:

a. how utility and DER developer time and expense are minimized for each procurement transaction;

The Company has standardized procurement documentation to enable more efficient practices for the Company and developers, implementing cost-effective solutions and reduced processing times as part of the procurement process, where applicable. During stakeholder engagement sessions in April 2017 and November 2017, stakeholders discussed the time frame for developers to respond to RFPs and generally agreed that additional time would result in higher quality proposals, recognizing that the appropriate response time depends on the type, size, and location of the project. In response, Con Edison extended its RFP response times from the 6 weeks initially allotted in Round 1 to 8-10 weeks in Rounds 2 and 3 to balance the urgency of the need with providing RFP respondents the necessary time to develop a solution. In one-on-one discussions with various RFP respondents, the respondents generally agreed they are given sufficient time to prepare responses.

The Company's use of the feasibility assessment described in question "2a)" saves developers through avoidance of projects with little to no likelihood to deliver a cost-effective and feasible portfolio. This saves time and expense both for developers and Con Edison.

Additionally, the Company's prescriptive ESS offering was re-designed to initiate contracting with projects at certain SIR milestones. This design component provides a higher level of certainty of project details at the time of contracting, with the goal of minimizing the investment of time and capital into projects that are at high risk to not meet the load relief dates identified for the territory.

b. how standardized contracts and procurement methods are used across the utilities.

Best practices in both contracting and procurement are shared among the Joint Utilities.

4) **Describe where and how DER developers and other stakeholders can access up-to-date information about current NWA project opportunities.**

Current NWS project opportunities are widely publicized to promote broad awareness and advanced notice of upcoming market opportunities. Non-wires solution solicitations are available at the following online resources:

- Con Edison website: (https://www.coned.com/nonwires).
- Con Edison hosting capacity maps: (https://www.coned.com/en/business-partners/hosting-capacity).
- Joint Utilities of New York central data portal: (http://jointutilitiesofny.org/utility-specific-pages/nwa-opportunities/).
- REV Connect: (https://nyrevconnect.com/non-wires-alternatives/).
- Filed with the Commission under the generic REV proceeding (Case No. 14-M-0101) and Con Edison's rate case proceedings (Case No. 16-E-0060, Case No. 19-E-0065, and Case No. 22-E-0064).

5) **Describe how the utility considers all aspects of operational criteria and public policy goals when deciding what to procure as part of a NWA solution.**

One of the key priorities in building an NWS portfolio is maintaining system reliability. All NWS portfolios are expected to meet the system need; those that do are then evaluated using the BCA Handbook. The technology solutions considered are informed by market responses to solicitations (e.g., requests for information ("RFI") and RFPs). However, the Company has encouraged innovative solutions in recent solicitations and optimizes portfolios based on a set of criteria as listed below to provide a diverse, reliable, and cost-effective portfolio to balance delivery risk and optimize offerings for customers.

The Company defines innovative solutions as solutions that: (1) target customers and uses technologies that are currently not part of Con Edison's existing programs, (2) target generally underserved customer segments, and/or (3) are based on the use of advanced and innovative technology that helps foster new DER markets and provides potential future lessons learned. In practice, the Company is receiving proposals and building balanced portfolios that incorporate EE, ESS, and other DM solutions, thus helping to meet public policy goals. Proposals are generally evaluated using the following criteria:

- Proposal content and presentation
- Project costs
- Benefit-cost analysis
- Execution risk
- Respondent qualifications
- Customer acquisition
- Timeliness
- Coincidence with peak and deficiency period
- Technology viability
- Community impact
- Innovative solutions (e.g., underserved customer segment)

Considerations for assembling a NWS portfolio include, but are not limited to, the ability of the solutions to meet the identified load relief at the network peak and for the duration of the overload, cost-effectiveness, execution risk of the various solutions, and the ability to achieve a SCT score of 1.0 or greater as required by the Commission. Where the proposals received have been insufficient to meet the need and there is adequate lead time, the Company may pursue

other buying strategies. Examples of how the Company has been creative in assembling viable NWS portfolios include providing scoring criteria that rewards innovative solutions and releasing technology-specific RFPs.

6) **Describe where, how, and when the utility will provide DER developers and other stakeholders with a resource for accessing up-to-date information about all completed and in-progress NWA projects. The information provided for each project should:**

   a. **describe the location, type, size, and timing of the system need addressed by the project;**

The Company's NWS website contains the solicitation documents for completed and in-progress NWS projects. Additionally, the Company files quarterly reports and an annual report in Case Nos. 16-E-0060 and 14-E-0302 (BQDM) that provide up-to-date information about completed and in-progress NWS projects. Non-wires solution quarterly reports are filed in Case No. 22-E-0064 (the latest rate case).

   b. **provide the amount of traditional solution cost that was/will be avoided;**

Con Edison does not provide the cost of the traditional solution. Revealing the traditional solution cost could result in suboptimal procurement results to the detriment of utility customers.

   c. **explain how the selected NWA solution enables the savings; and**

Con Edison provides information on the expected load reduction for each solution in the annual implementation plans.

   d. **describe the structure and functional characteristics of the procurement transaction between the utility and the solution provider(s).**

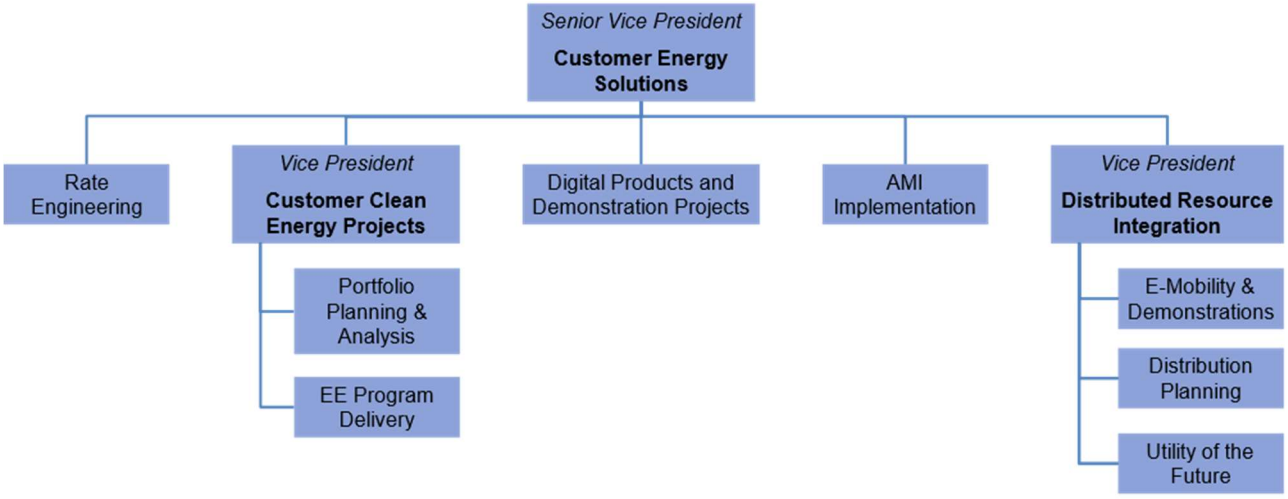
The Company interprets this question to refer to information about the procurement mechanism, such as RFP or auction. This information is available in the solicitation documents available on the Company's NWS website and quarterly and annual reports.

3. OTHER DSIP-RELATED INFORMATION

3.1. DSIP GOVERNANCE

Con Edison's organizational structure brings together policy, business, and technical experts to support more holistic approaches to REV implementation and improve the customer experience. Effective November 1, 2017, realignments in Con Edison's organizational structure resulted in the formation of the CES organization. The CES organization guides the Company's overall clean and distributed energy strategy and is leading the Company to evolve its energy business to become cleaner, adapt its business model to be more innovative, and transform the customer experience to provide best-in-class service. The group is focused on expanding customer choice, enhancing the customer experience, and fostering customer engagement, including integrating DER and other customer-facing technologies, and supporting markets for new customer products and services. To improve this focus, the Company has established a Vice President of CCE Programs, which focuses on portfolio analysis of customer-facing programs and delivery of EE programs. The CES organization also consolidates distributed resource integration functions under a vice president, with responsibilities for e-mobility, distribution planning, and utility of the future. These organizational changes reflect Con Edison's commitment to a clean energy transition and emphasize critical policy priorities like EE, clean heat, and EVs. CES further unites a broader set of functions that influence the customer experience, including AMI implementation, digital products and demonstration projects, and rate engineering. Figure 39 shows the business functions that fall within CES and report to the Senior Vice President of CES, who directly reports to the President of CECONY.

Figure 39: CES Organizational Structure



Organizational adjustments are enacted within CES to further align functions and support greater efficiencies, occasionally resulting in the formation of new groups. For example, to execute the EV-enabling programs discussed in Section 2.5, CES formed an e-mobility team to design and develop EV programs and rate options. Additionally, the digital products and demonstration projects team was formed to deliver clean energy enabling technologies, like the DERMS discussed in Section 2.3.

These organizational changes demonstrate the Company's commitment to accountability, intra-company coordination, and standardization where possible and where it results in greater efficiency. Through greater institutional coordination and communication, the Company can better disseminate best practices and lessons learned, feeding a culture of continuous improvement.

At the executive level, formal committees provide strategic direction on Company initiatives, including DSP development and grid modernization, and the necessary approvals to proceed. Executives from the relevant business areas participate to exchange information and represent a variety of perspectives to inform decision-making.

This organization and committee structure align the people, processes, and technologies to facilitate DSP development and provides the appropriate oversight and management of DSP-related work streams and functions. Core DSP work streams, such as hosting capacity modernizing protective relays, and SCADA and metering upgrades, are managed by dedicated project managers within Distribution Planning. Currently, Distribution Planning has primary responsibility for developing the DSIP, with input from other groups internal and external to CES.

The DSIP serves as a core planning document for the Company, outlining its plans across DER integration, information sharing, and market services over the course of the next five years based on current Company and New York State priorities and objectives. While the Company's DSIP is separate and distinct from its rate case, the DSIP will ultimately serve to inform subsequent rate case filings. The Company's rate case filing builds from the five-year plan within the DSIP and incorporates additional inputs from other regulatory, policy, and litigation processes to prioritize investments for which the Company will seek cost recovery.

Joint Utilities Collaboration

The Joint Utilities are working together to foster common and consistent approaches, tools, and methodologies that will support statewide markets for DER products and services and help reduce transaction costs for third party providers. The JU strive for standardization where possible, recognizing that the utilities are diverse in their service territories, grid configurations, data availability, and the degree of development of existing capabilities. The Joint Utilities also regularly share lessons learned from demonstration projects and ongoing efforts implementing REV.

In 2014, each utility appointed leaders to serve on the REV Leadership Team (“RLT”), which meets weekly to raise awareness of emerging issues, collaborate on shared initiatives, and work toward alignment on the way the JU plan for and transition to their new roles as DSP operators. The RLT established two committees—the Regulatory Policy Committee (“RPC”) and DSP Steering Committee. The RPC coordinates the Joint Utilities’ efforts in policy and rate-related proceedings that fall under the larger REV framework. The DSP Steering Committee discusses strategic issues affecting the JU and makes collective decisions on behalf of the JU. The Steering Committee meets twice per month.

The Steering Committee oversees topic-specific implementation Working Groups, which **Table 22** lists below. These Working Groups, staffed by utility SMEs, were formed to discuss specific technical details, share best practices, and reach common recommendations on how to implement DSP functions. To support these collaborative processes across the six companies, the JU retained a consultant to provide project management office functions and technical expertise, as well as coordination of the implementation working groups and related stakeholder engagement efforts.

Table 22: Current Joint Utilities Implementation Working Groups

Working Groups			
1	Integrated Planning	**9**	CDG Billing and Crediting
2	Interconnection Policy	**10**	Coordinated Grid Planning
3	Interconnection Technical	**11**	NYISO Load Forecasting
4	ISO-DSP Coordination	**12**	NYISO Installed Capacity
5	DER Sourcing/ NWS Suitability Criteria	**13**	Information Sharing
6	Electric Vehicles	**14**	IEDR Technical
7	Energy Storage	**15**	DER Sourcing
8	NYISO Market Issues		

To improve transparency and facilitate information sharing, the JU collectively maintains and regularly updates their website (www.jointutilitiesofny.org) with valuable resources for interested parties. For example, the utilities post a quarterly summary of current JU DSP enablement activities to the website homepage each month to keep third parties informed of efforts to advance DSP implementation. The Joint Utilities enhanced their website by compiling utility-specific links for hosting capacity, system data, EVs, and NWS opportunities. The website also serves as a valuable repository for stakeholder information, providing key policy and regulatory documents, detailing past stakeholder meetings, summarizing inputs that stakeholders have previously provided and next steps for addressing them, and providing links to other resources such as REV Connect. The JU welcome suggestions to enrich the website through their email address at: info@jointutilitiesofny.org.

3.2. MCOS STUDY

The 2023 DSIP Guidance requires utilities to include a publicly accessible web link to the latest version of the utility's MCOS Study. Con Edison's latest approved MCOS study was filed in the DSIP proceeding and VDER Proceeding and is available by searching for Cases 16-M-0411 or 16-E-0060 on the DPS website found here: https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=51282.

3.3. BENEFIT COST ANALYSIS

The 2023 DSIP Guidance requires utilities to include a publicly accessible web link to the latest version of the utility's BCA Handbook. The Company's current version, Con Edison's Electric BCA Handbook v4.0, is available by searching for Case 16-M-0411 on the DPS website. This is the general link to the case, *In the Matter of Distributed System Implementation Plans*: https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=16-M-0411.

3.4. UTILITY CODE OF CONDUCT (AFFILIATE TRANSACTIONS POLICY)

As directed by the Commission in its Order Setting Standards for Codes of Conduct,[231] Con Edison currently provides training covering the rules about information sharing between regulated utilities and competitive energy affiliates.[232] Designated Con Edison employees that interact with DERs and other competitive energy companies are required to take this training course annually. The training requirement is included in the Company's Affiliate Transactions Policy.

In the Code of Conduct Order, the Commission also required Con Edison to include any code of conduct modifications with its biannual DSIP filings. On March 1, 2023, Consolidated Edison Inc. ("CEI") successfully completed the sale of its wholly owned subsidiary, Con Edison Clean Energy Businesses, Inc., including the transfer of substantially all of its assets,[233] to RWE Renewables America, LLC. Currently, the Company does not have any competitive energy affiliates and will suspend the code of conduct training.

Con Edison will provide notice to the Commission of any new competitive energy affiliates for the Company and in such event will update and reinstitute the code of conduct training accordingly.

[231] Case 15-M-0501 – In the Matter of a review of Utility Codes of Conduct as Impacted by Reforming the Energy Vision, *Order Setting Standards for Codes of Conduct*, issued and effective September 15, 2016, p. 22 ("Code of Conduct Order").
[232] Id. at 21.
[233] CEI retained the equity interests in a wind power project, as well as tax equity interests in solar energy projects, located outside New York State.

APPENDIX A: DER LOAD MODIFIER FORECASTS

The forecast data is organized in the sections below as follows:

- System-level forecasts:
  - 5-year peak demand forecast
  - 10-year peak demand forecast
  - 5-year energy forecast
- Network area forecasts:
  - 10-year independent peak demand forecast
- DER forecasts
  - DSM (including EE and DR)
  - DG (including solar PV, CHP, other generation, and energy storage)

SYSTEM FORECASTS

Forecast of System Peak Demand Growth

Every year, following the summer peak season, the Company produces a series of forecasts to guide the next planning cycle, including 20-year electric system peak demand forecasts and a 5-year system energy forecast. The single electric system peak hour (system-wide and by network load area) developed as part of the peak demand forecast sets the design point for maintaining system reliability.

These forecasts are developed using a hybrid of top-down and bottom-up methodologies, which improves forecasting accuracy by allowing for cross-referencing of meter data and queued projects with overall macro-economic trends. Additionally, by comparing the top-down system-wide peak load analysis to the bottom-up network peak load analyses, the Company can verify the allocations of load in its annual peak load forecast.

The electric peak demand forecast is produced by adding incremental MW demand growth of key customer sectors: residential, commercial, and governmental. Along with sector demand growth, non-sector-specific technology-driven load growth is also added, such as EV, EoNH, or conversions from steam to electric air conditioning (“A/C”).

To determine residential sector growth, the residential top-down econometric model considers number of households, real disposable income and gross metro product. To determine commercial sector demand growth, the commercial top-down econometric model considers the number of customers by service classification, the price of electricity, and other macroeconomic measures. Governmental sector demand growth is calculated by aggregating announced projects for the initial years of the system forecast (bottom-up methodology), before switching to a top-down approach.

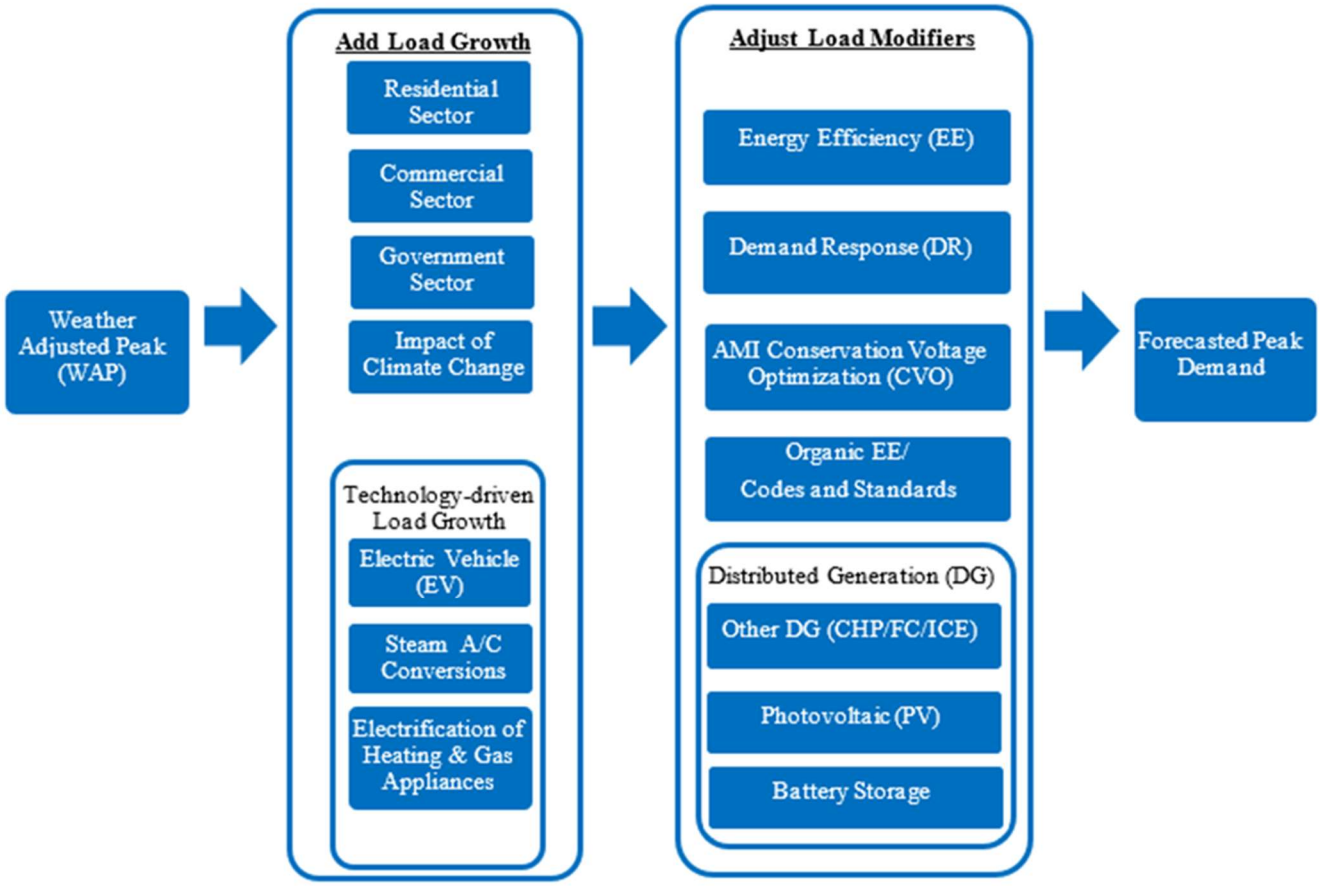
There are various DER measures that offset demand, such as EE, DR, DG, PV, energy storage, and targeted load relief programs, collectively referred to as negative load modifiers. Organic EE and CVO were added as load modifiers in the fall 2017 forecast. DER are forecasted using primarily bottom-up methodologies by counting projects or program totals for both system and network forecasts. EE and DR forecasts are based on program-level projections based on historical and expected future performance. DG, including all solar, CHP, and energy storage, are forecasted using cumulative historical penetration, known queued projects, and extrapolated future growth rates. The details and underlying assumptions regarding the forecasting of DER will be described in greater detail below in the DER Forecasts section.

The positive load modifiers, EVs and steam to electric A/C, are also forecasted using a bottom-up methodology. EV forecasting is based on current registration data from the Department of Motor Vehicles, expected growth rates based

on State goals and outside studies,[234] and the assumed average kW per vehicle. Steam to A/C conversions are driven by steam chillers replacement with electric chillers. Incremental load growth from steam to electric A/C is based on the aggregation of all customer conversions.

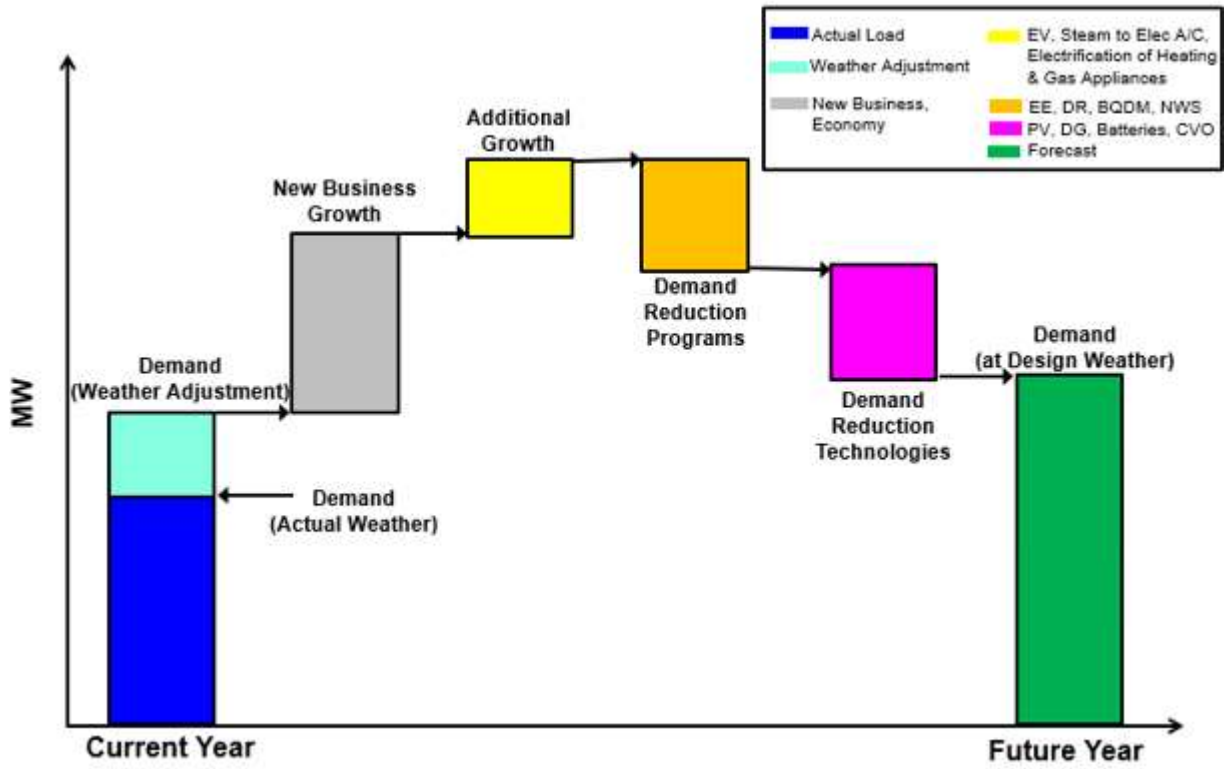
As noted above, the sector forecasts generally use a top-down methodology, which takes a holistic view of macro-economic conditions that influence electric demand. Bottom-up methodologies are used when there is sufficient data available to build a forecast. The combination of top-down and bottom-up works well for forecasting demand growth, as it allows cross-referencing of the meter data and queued projects with the overall macro-economic trends. Figure 40 and Figure 41 below show the basic process of producing a system peak forecast.

Figure 40: System Peak Forecasting Process - Summer Peak



[234] M.J. Bradley & Associates, *Plug-in Electric Vehicle Cost-Benefit Analysis: New York* (December 2016): https://www.mjbradley.com/sites/default/files/NY_PEV_CB_Analysis_FINAL.pdf.

Figure 41: Illustrative Process of Adjusting Forecasting (not to scale)



Five-Year System Peak Demand Forecast

The following five-year system peak demand forecast was issued in October 2022 and covers the years 2023 to 2027. **Table 23** shows the overall forecasted electric system load growth, with a CAGR of 0.6 percent over the 5-year period.

Table 23: 2022 Electric Five-Year System Peak Demand Forecast (MW) – Summer Peak

		2022	2023	2024	2025	2026	2027
1	**WAP/ Load Growth Forecast**	**12,692**	**13,103**	**13,407**	**13,581**	**13,704**	**13,793**
2	MW Growth		411	305	174	123	90
3	% Growth		3.2%	2.3%	1.3%	0.9%	0.7%
4	**Additional MW Growth (Rolling Incremental)**						
5	EoNH		13	27	40	53	94
6	EV		78	123	190	238	280
7	Steam A/C Conversion		9	17	26	34	43
8	**Load Modifiers (Rolling Incremental)**						
9	PV		-40	-70	-105	-135	-156
10	DG		-11	-24	-44	-49	-53
11	Battery Storage		-9	-53	-104	-131	-187
12	Organic EE/ Codes and Standards		-73	-143	-208	-274	-349
13	**Coincident DSM (Incremental)**						
14	Con Edison EE		-57	-44	-58	-84	-86
15	NYSERDA EE		-11	-6	-5	-3	-1
16	NYPA		-7	-2	-3	-3	-3
17	BQDM		-4	-4	0	0	0
18	DR		0	0	0	0	0
19	Total Incremental DSM		-80	-56	-66	-90	-91
20	Rolling Incremental DSM		-80	-135	-201	-291	-382
21	**System Forecast net of both positive and negative modifiers**		12,989	13,149	13,175	13,149	13,083
22	MW Growth		297	160	26	-26	-66
23	**Rounded System Forecast net of both positive and negative modifiers**		**12,990**	**13,150**	**13,180**	**13,150**	**13,080**
24	MW Growth (Rounded)		298	160	30	-30	-70
25	% Growth		*2.3%*	*1.2%*	*0.2%*	*-0.2%*	*-0.5%*

Note: 2022 Demand is Weather-Adjusted

System forecast line-item descriptions:

Line 1: Weather-adjusted peak ("WAP")/Load Growth Forecast: WAP in 2022, new business load growth forecasts in 2023 and beyond, and economic recovery from COVID-19 adjustment in 2023 and 2024

Line 2: MW Growth: Cumulative growth of residential, commercial, and governmental sectors, as well as economic recovery from COVID adjustment in 2023 and 2024

Line 3: Percentage Growth: Growth as a percentage of the base

Line 5: Electrification of Non-Heating – The incremental load growth associated with electrifying gas appliances

Line 6: EV – The incremental load growth associated with EV charging

Line 7: Steam A/C Conversion – The incremental load growth associated with customers converting steam chillers to electric air-conditioning

Line 9: Photovoltaic (PV) – The cumulative effect of the solar units (PV) coincident with peak hour demand

Line 10: DG – The peak load reduction associated with non-solar generators (*e.g.*, CHP, gas turbines, *etc.*)

Line 11: Energy Storage – The peak load reduction associated with appropriately rated batteries

Line 12: Organic EE/ Codes and Standards – The peak load reduction associated with appropriately estimated Organic EE/ Codes and Standards

Line 14: Con Edison EE: Annual incremental forecasted system coincident demand reductions from Con Edison's EE programs

Line 15: NYSERDA EE: Annual incremental forecasted system coincident demand reductions from NYSERDA's EE programs

Line 16: NYPA: Annual incremental forecasted system coincident demand reductions from NYPA EE/DM projects

Line 17: BQDM: Annual incremental forecasted system coincident demand reductions from the BQDM program

Line 18: DR: Annual incremental forecasted system coincident demand reductions from Con Edison's commercial and residential DR programs, not including NYISO DR

Line 19: Total DSM - Annual sum of peak reduction programs

Line 20: Rolling Incremental DSM – Total sum of new (*i.e.,* not baked into the previous year's WAP) peak reduction programs, including the previous year

Line 21: System Forecast less DSM, less DG, PV, and Battery Storage + EoNH + EVs + Steam A/C – System forecast including all incremental growth and load modifiers

Line 22: MW Growth – Net growth; sector growth plus technology driven growth less DER load modifiers

Line 23: Rounded System Forecast net of positive and negative load modifiers to the nearest 10 MW

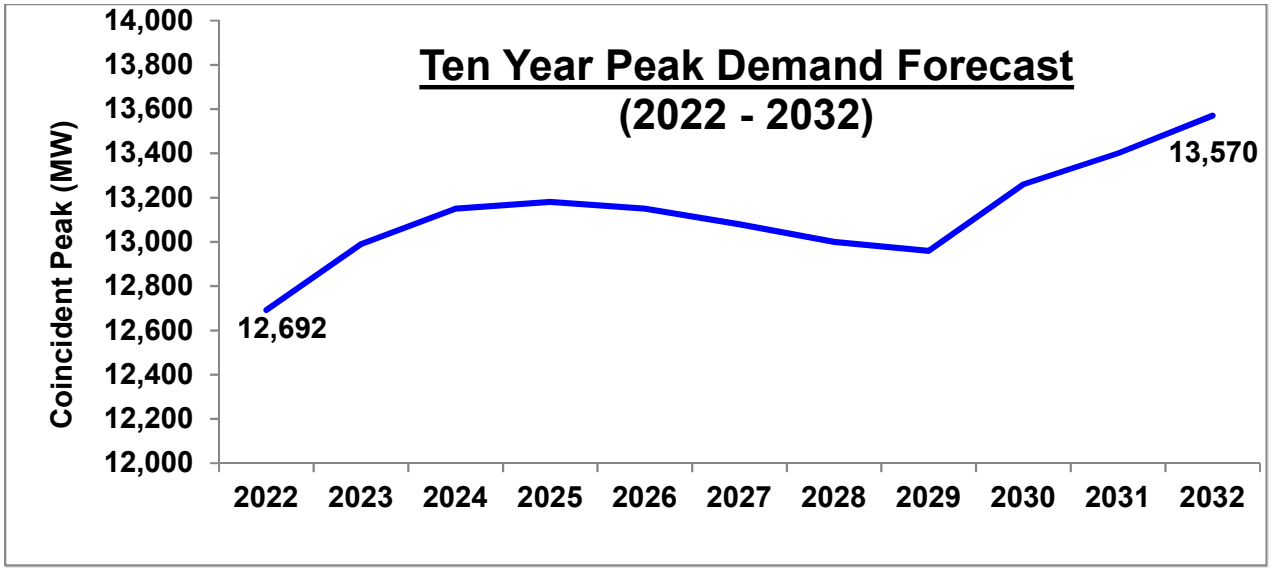
Line 24: MW Growth (Rounded): Net growth rounded to the nearest 10 MW; sector growth plus technology driven growth less DER load modifiers

Line 25: Percentage Growth – Rounded MW Growth as a percentage of the rounded system forecast

10-Year System Peak Demand Forecast

The following 10-year system peak demand forecast was issued in October 2022 and covers the years 2023 to 2032. Figure 42 shows the 10-year CAGR is 0.7 percent, resulting in a 2032 system coincident peak of 13,570 MW. This is a 180 MW increase compared to the 2021 forecast. While EVs, EoNH, and new business growth are contributing to an increase in load, this increase is offset by forecasted load reductions from DSM, PV, DG, and energy storage and the addition of organic EE/Codes and Standards as negative load modifiers.

Figure 42: 10-Year System Coincident Peak Demand Forecast



5-Year CAGR (2022 – 2027)	0.6%
10-Year CAGR (2022 – 2032)	0.7%

Five-Year System Energy Forecast

The current delivery volume forecast for Con Edison's service classes reflects an approximate two percent decline in sales over the five-year period. The primary driver of the decline is EE, particularly the Company's EE programs. Other factors contributing to the decline include continued growth of residential solar and other DG. The decline in the forecasts have been tempered by increases in the forecast for EoH and EV impact.

The forecasts of delivery volumes for major service classifications[235] are based on econometric models, whereas the forecasts of delivery volumes for the other service classifications are performed on a deterministic or individual service class basis. The delivery volume forecast for Con Edison customers includes the following adjustments, described in greater detail in the DER Forecasts section:

[235] SC 1 (Residential), SC 2 (Small Commercial), SC 5 (Railroad Platform and Stations Lightings), SC 6 (New York City Private Street Lighting), SC 8 (Master Metered Apartments), SC 9 (Large Commercial), and SC 12 (Multiple Dwelling Space Heating). NYPA Service Classes are also included in the energy forecast by service class: SC 62 (General Small), SC 66 (Westchester Street Lighting), SC 80 (New York City Street Lighting), SC 91 (NYC Public Buildings), and KIAC (Kennedy International Airport Cogeneration).

- Solar Generation – To account for the projected delivery volumes associated with the installation of solar panels by customers who will then generate a portion or all of their energy requirements.
- Standby Service – To reflect the projected delivery volumes from customers who plan to convert a portion, or all, of their existing load to onsite generation and will become standby service customers.
- DSM Programs – To account for expected energy reductions resulting from EE.

Table 24: Five-Year System Energy Forecast (GWh)

	2023	2024	2025	2026	2027
Con Edison	41,427	41,520	41,260	41,070	41,119
NYPA	9,298	9,201	8,891	8,801	8,730
Recharge New York	688	688	688	688	688
Total	51,413	51,409	50,839	50,559	50,537

NETWORK LOAD AREA INDEPENDENT PEAK DEMAND FORECASTS

Con Edison also prepares network load area and radial feeder level peak demand forecasts, which roll up to the substation level. Networks are forecasted both for their independent peaks (termed “Independent Network Peak Forecast”), which may differ from the system peak hour and can vary among networks, and for their coincidence with the system peak (termed “Coincident Network Peak Forecast”). Similar to the system demand forecast, the loads are modified to account for any applicable reductions for DER-related programs and other load growth (EoNH, EVs and steam A/C to electric A/C). The Network Forecasts are developed in parallel with the System Forecast during the early fall to incorporate the most recent summer experience. However, the Coincident Network Peak Forecast requires some parameters determined in the System Forecast, so it cannot be finalized until after the System Forecast is complete.

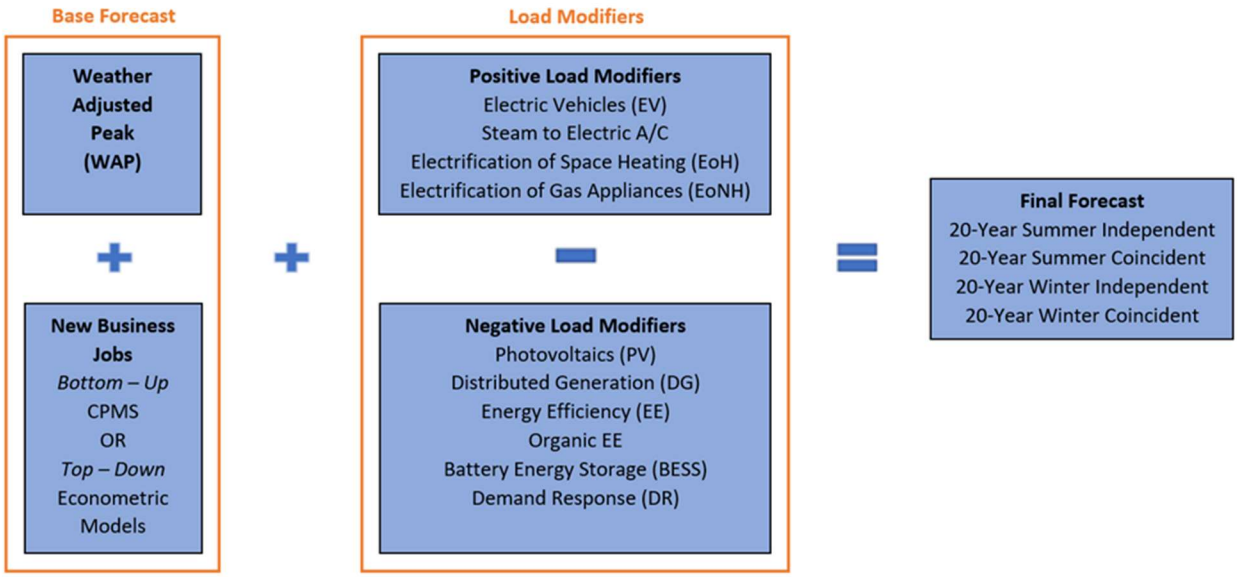
For the Independent Network Peak Forecast, the new business growth for the first five years is developed using a bottom-up approach where the Company has insight on upcoming new business jobs for each sector. This results in a more accurate forecast because the macroeconomic factors used to determine top-down growth cannot be finely parsed across the network and radial areas. "New service” new business jobs greater than 100 kVA and “additional service” new business jobs greater than 300 kVA within the electric service territory are evaluated by the Company’s SMEs in the Energy Services and Customer Engineering Departments to determine the total load, the network location, and timeline for when it will come online. In addition, the Company maintains a separate list for non-Energy Service jobs that are initiated outside the typical process. Beyond the fifth year, the top-down approach is applied, with the system level growth allocated to each network based on the network’s contribution to the first five years of growth. There are some exceptions in which the bottom-up methodology is still used beyond the fifth year if it results in a higher estimated network growth than the top-down methodology.

The base load for the network forecast is developed by adding the estimated growth to the WAP. The final Independent Network Peak Forecast is developed by adding the net of the load modifiers to the base forecast. Each network’s peak hour will inform localized infrastructure investment decisions.

The Coincident Network Peak Forecast, which uses the Independent Network Peak Forecast as a starting point, evaluates the networks’ expected load during the system peak hour. Therefore, the Coincident Network Peak Forecast must add up to the System Forecast, minus any transmission losses. The annual coincident growth (or base load) is developed using the annual growth of each network (derived from the Independent Network Peak Forecast), the total system growth minus transmission losses, and the ratio of the independent growth of each network to the sum of all independent growth. Once the base load for the network coincident forecast is developed, it must be verified that the

independent forecast is higher than or equal to the coincident forecast. Once verified, the base load will be added to the WAP and load modifiers to develop the final Coincident Network Peak Forecast. Figure 43 provides an overview of the network forecasting process.

Figure 43: Electric Network Peak Demand Forecast Process



There are pockets of high growth, largely driven by revitalization of certain residential neighborhoods in Brooklyn, Queens, and Manhattan. In total, as Table 25 shows below, there are 48 electric network areas that have compounded annual load growth rates of 1.0 percent or higher per year for the next 5 years, per the Independent Network Peak Demand Forecast, with some networks projecting much higher growth.

Table 25: 2022-2032 Network Area Forecasted Growth Rates

Network (excludes radial feeder loads)	5-Yr CAGR	10-Yr CAGR
Hudson	9.2%	4.8%
Pennsylvania	8.3%	5.0%
Borden	6.4%	4.2%
Cortlandt	5.9%	4.1%
Turtle Bay	5.8%	3.6%
Grasslands	5.0%	3.4%
Borough Hall	5.0%	3.6%
Fashion	4.3%	2.8%

Greeley Square	3.8%	2.5%
Triboro	3.3%	3.4%
Sutton	3.2%	2.1%
Midtown West	3.1%	1.6%
Fulton	3.1%	2.0%
Chelsea	3.1%	2.1%
Williamsburg	2.9%	2.4%
Jackson Heights	2.6%	2.0%
Prospect Park	2.2%	2.0%
Roosevelt	2.2%	1.3%
Sheridan Square	2.2%	1.3%
Grand Central	2.1%	2.0%
Beekman	2.1%	1.6%
Long Island City	2.1%	1.8%
Cedar Street	2.1%	1.8%
Jamaica	2.0%	1.9%
City Hall	2.0%	1.6%
Empire	2.0%	1.1%
Brighton Beach	1.9%	1.8%
Crown Heights	1.9%	1.9%
Yorkville	1.9%	1.3%
Lincoln Square	1.8%	1.3%
Bay Ridge	1.7%	1.5%
Sunnyside	1.6%	1.2%
Richmond Hill	1.6%	2.2%
White Plains	1.6%	2.3%

Canal	1.5%	1.0%
Greenwich	1.5%	1.0%
Hunter	1.5%	0.9%
West Bronx	1.5%	1.4%
Flatbush	1.4%	1.4%
Rockview	1.4%	2.4%
Madison Square	1.3%	1.0%
Lenox Hill	1.3%	0.8%
Ridgewood	1.2%	1.5%
Plaza	1.1%	0.9%
Fresh Kills	1.0%	1.3%
Harlem	1.0%	1.2%
Washington Heights	1.0%	1.1%
Times Square	1.0%	0.8%
Granite Hill	0.9%	1.4%
Maspeth	0.9%	1.1%
Cooper Square	0.9%	1.0%
Rockefeller Center	0.8%	0.7%
Washington Street	0.8%	1.4%
Herald Square	0.6%	0.5%
Rego Park	0.6%	0.7%
Harrison	0.6%	1.2%
Central Bronx	0.5%	1.2%
Ocean Parkway	0.4%	0.7%
Woodrow	0.4%	1.2%
Park Place	0.3%	0.0%

Columbus Circle	0.3%	0.3%
Bowling Green	0.2%	0.3%
Flushing	0.2%	0.7%
Sheepshead Bay	0.2%	0.4%
Central Park	0.1%	0.6%
Park Slope	0.0%	0.3%
Fordham	0.0%	0.3%
Pleasantville	0.0%	0.7%
Freedom	-0.2%	0.1%
Kips Bay	-0.2%	0.2%
Fox Hills	-0.2%	0.5%
Riverdale	-0.2%	0.2%
Southeast Bronx	-0.4%	1.3%
Ossining West	-0.5%	0.6%
Willowbrook	-0.5%	-0.1%
Millwood West	-0.9%	1.2%
Buchanan	-1.1%	-0.1%
Northeast Bronx	-1.2%	0.2%
Elmsford No. 2	-1.2%	-0.8%
Mohansic	-2.0%	-2.0%
Randalls Island	-2.3%	-0.8%
Wainwright	-2.4%	-1.1%
Battery Park City	-5.3%	-2.8%

The Company also prepares forecasted network-level 24-hour peak load duration curves and network level 24-hour minimum load duration curves, which are available through the Company's hosting capacity maps. Additionally, the Company provides historical 8,760 hour load data for each network as part of the system data pop-ups in its online hosting capacity maps.

DER LOAD MODIFER FORECASTS

Increased adoption of DER will introduce new challenges for maintaining forecasting accuracy due to uncertainties associated with the variability of DER output, its evolving correlation with net load, and the impact of geographic diversity on aggregate DER output. These new DER will have locational-specific impacts determined in part by the ways in which penetration rates evolve in each part of the distribution system. As a result, increasing levels of DER will drive the need for forecasting of future net load levels at more granular levels. For example, pairing top-down econometric forecasting approaches with more granular forecasts will enable planners to evaluate distribution system needs more accurately as DER penetration increases. These more granular load forecasts consider economic indicators and analyze load shapes based on the characteristics of individual loads or local areas. The development of these approaches for forecasting both load and DER output will enable more accurate representation of the system at varying load levels to help planners understand when and where constraints may emerge.

Within internal planning processes, DER are organized into one of two subgroups: DSM or DG. DSM includes both EE programs, DM, and DR. The DG group includes subset types of DG, namely PV, CHP or other spinning generators, and energy storage. The performance and behavior of DER drives the load shape, peak value, and hour of the peak. Pinpointing these values increases forecast accuracy, while uncertainty in DER quantities, locations, and timing drives forecast error.

DSM Programs

Expected energy savings from EE and DM programs are distributed across the electric networks in the forecast using planned program growth, historical consumption data, and customer demographic information. These energy savings are then converted to peak demand savings using annual hourly load curves, which vary with the measures and specific customer segment related to each program. A geographic uncertainty factor is applied to the expected demand reductions to reflect the uncertainty of where the future savings from system-wide programs will be realized.

Incremental EE program savings are projected annually into the future as far out as the programs are funded or highly likely to be funded. Excluded from the forecast are impacts of codes and standards or naturally occurring EE implemented outside of programs, although these effects are captured in a separate load modifier (“Organic EE/Codes and Standards”).

For DM and DR programs, forecast data come from internal program managers who gather information from their implementation contractors and market participants. Future volume and demand reductions are tied to filed and approved program goals and budgets adjusted by historic performance and future performance expectations. For DR programs, discount factors are applied to enrolled MW for network forecasts based on the size and diversity of enrollments in each individual network. DR programs are not included in the volume forecast because the energy savings are both uncertain (programs may or may not be called) and *de minimis* (even if events are called).

Table 26: 2022 Electric System Peak Demand Forecast - DSM Programs (MW)

line	Program	2023	2024	2025	2026	2027
14	Con Edison EE	-57	-44	-58	-84	-86
15	NYSERDA EE	-11	-6	-5	-3	-1
16	NYPA	-7	-2	-3	-3	-3
17	BQDM	-4	-4	0	0	0
20	DR	0	0	0	0	0
21	Total Incremental DSM:	-80	-56	-66	-90	-91
22	Rolling Incremental DSM:	-80	-135	-201	-291	-382

Table 27: Delivery Volume Adjustments by Service Class - DSM Programs (GWh)

Delivery Volume Adjustments (GWh) – DSM Programs		2023	2024	2025	2026	2027
Con Edison	Total	-841	-1,203	-1,639	-1,928	-2,047
NYPA	Total	-200	-280	-388	-454	-478
System	Total	-1,041	-1,483	-2,027	-2,382	-2,525

Table 28 lists the specific programs the forecasts include.

Table 28: DSM Programs Included in the Forecast

EE	DM	DR[236]
Con Edison Electric Programs • Small Business Direct Install • Multifamily • Commercial & Industrial Equipment Rebate • Commercial & Industrial Custom Efficiency • Residential Electric **NYSERDA Clean Energy Fund[237]** • Residential Sector • Multifamily Sector • Commercial Sector **NYPA Programs** • BuildSmart NY	**Con Edison Electric Programs** • BQDM • Targeted Demand Management Projects	**Con Edison Electric Programs** • CSRP – Reservation Payment Option • Direct Load Control ("DLC") Program

DG

DG is included in demand and energy forecasts. For purposes of forecasting, DG is defined as DER capable of operating in parallel with the grid and exporting power back, including solar PV, CHP, and other rotating generation, fuel cells, and energy storage, which represent the overwhelming majority of DG in the Con Edison service territory.

Solar PV

The forecasting of solar PV, as with other DER, involves determining both the impact of the DER and the future growth rate. To assess the impact of currently deployed solar PV, the Company collects AC nameplate kW capacity and application of PV jobs in the interconnection queue from the interconnection processing system. The Company also analyzes available solar output per hour data and the location of the PV projects. The solar output for each hour is determined by reviewing interval data and is representative of four summer months of data (June 1 – September 30) across a sample set of large PV sites with SCADA data. Figure 44 shows the output curve.

[236] Excluded DR programs include DLRP and CSRP Voluntary Participation Options, DLRP Reservation Payment Option, and NYISO DR Programs ("SCR").

[237] Case 14-M-0094, *Proceeding on Motion of the Commission to Consider a Clean Energy Fund*, Order Commencing Proceeding (issued May 8, 2014).

Figure 44: Measured Solar Output Curve Using Sampled Interval Meter Data

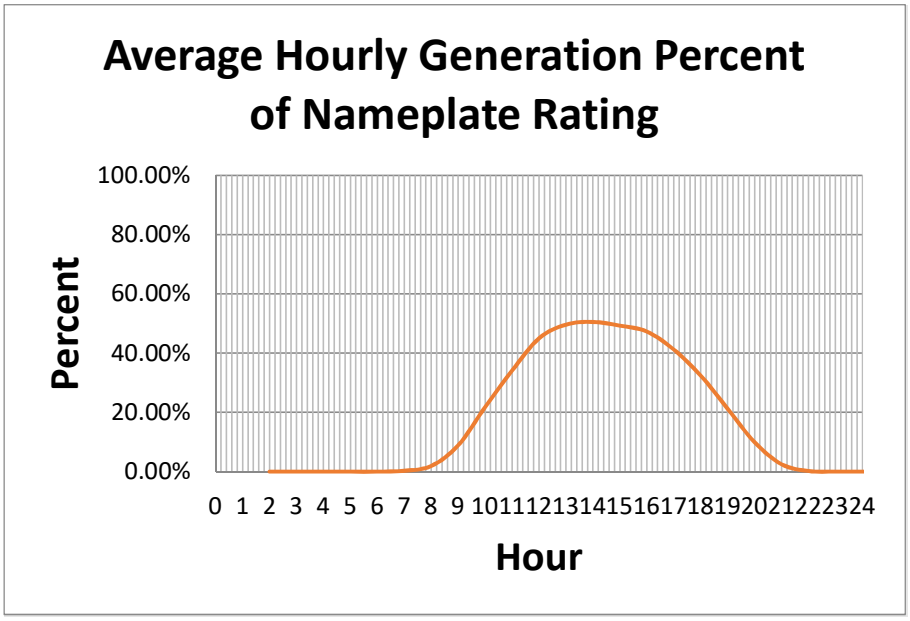


Table 29: Average Summer Solar Output for Large PV (>25 kW) as a Percentage of Nameplate Capacity (AC)

Hourly Solar Generation as a Percent of Nameplate (AC)			
Hour Ending	Average	Hour Ending	Average
1:00:00	0.0%	13:00:00	40.4%
2:00:00	0.0%	14:00:00	37.9%
3:00:00	0.0%	15:00:00	35.4%
4:00:00	0.0%	16:00:00	29.2%
5:00:00	3.5%	17:00:00	22.6%
6:00:00	3.7%	18:00:00	14.6%
7:00:00	7.2%	19:00:00	6.9%
8:00:00	15.3%	20:00:00	3.5%
9:00:00	24.6%	21:00:00	0.0%
10:00:00	32.5%	22:00:00	0.0%
11:00:00	38.4%	23:00:00	0.0%
12:00:00	40.5%	24:00:00	0.0%

The Company identifies where each PV job in the queue is located. Without network information for each PV, it is impossible to determine where PV is most prevalent, and where it has the greatest impact on the grid.

To assess the growth rate of solar PV installations, the initial two years of growth is based on the interconnection queue. For the years beyond the queue, the Company uses a probabilistic approach, including historical growth, cancellation, and decaying rates. For the PV forecast, the Company defined the following assumptions to build the 2022 PV forecast model for Con Edison's service territory:

- Residential customers include any account under 25 kW, and commercial customers include any account over 25 kW.
- Residential jobs go-live an average of 104 days after application date.
- Commercials jobs go-live an average of 530 days after application date.
- The peak occurs after June 1 of each summer.[238]

Twenty-five kW was selected as an approximate divider between residential and commercial projects in order to apply the lead times of large and small PV projects to the forecast. The lead-time assumptions for residential and commercial PV jobs are based on an analysis of average completion cycles of past projects. The analysis indicates residential PV goes live approximately 104 days after the application date and commercial PV goes live approximately 530 days after the application date. These lead times are expected to decrease as the interconnection process is further streamlined. As additional data is tracked and made available, the assumptions regarding go-live time will be updated and enhanced accordingly.

June 1 was assumed as a representative peak day for purposes of creating the model, which allows PV jobs that are in the queue to be parsed into groups that will go-live that summer or the following summer.

Based on the lead times and interconnection queue, there is sufficient detail to estimate which PV jobs will go-live the next summer. The queue does not contain enough information when the current year forecast is created to estimate how many PV jobs will go-live two summers into the future. Therefore, the number of PV installations for two summers into the future must be extrapolated based on a combination of the interconnection queue used to forecast the current year and long-term growth assumptions.

As shown in line 9 of the System Peak Demand Forecast (and included below for reference), PV is expected to contribute a rolling incremental 40 MW of load reduction in 2023, ramping to a rolling incremental 156 MW by 2027. This is based on the nameplate capacity of the PV, converting to AC, de-rating it to account for coincidence with Con Edison's system peak. The PV forecast is represented as rolling incremental where 2023 is the incremental decrease to system load, and each year thereafter is the reduction of that year and all years dating back to 2023. Over the 10-year period (2023-2032), the forecasted cumulative coincident solar PV MW is 373 MW (1,303 MW_{AC} nameplate).

[238] The PV output curve analysis includes the summer months between June and September. By selecting all summer months, it captures uncertainties of weather conditions and pending projects in the queue after June 1 of each summer.

Table 30: Electric Five-Year System Peak Demand Forecast – Solar PV (MW)

		2023	2024	2025	2026	2027
9	Photovoltaic (PV) (rolling incremental)	-40	-70	-105	-135	-156
	Coincident PV MW in AC (Cumulative)	-176	-206	-240	-270	-291
	% MW Growth	30%	17%	17%	12%	8%

Table 31 shows that solar generation at the system level is expected to contribute 114 GWh of energy reduction in 2020, ramping up to 379 GWh of reduction in 2024.

Table 31: Delivery Volume Adjustments by Service Class – Solar PV (GWh)

Delivery Volume Adjustments (GWh) – Solar Generation		2023	2024	2025	2026	2027
Con Edison	Total	-215	-319	-403	-492	-585
NYPA	Total	-16	-23	-31	-38	-46
System	Total	-231	-342	-434	-530	-631

CHP and Other Generation

CHP and other forms of rotating generation preceded the wide scale adoption of solar and energy storage. As such they are referred to within Company processes and forecasts as DG, even though they are a subset of DG. All references to DG in this section refer only to CHP and other rotating generations. This includes traditional DG like gas turbines and reciprocating engines, as well as newer technologies such as fuel cells and microturbines.

DG inputs are collected from developers prior to and throughout the interconnection process. The nameplate capacity and details of the go-live timing (looking three years out) are provided through the interconnection process and verified by the Company. Furthermore, for large DG units (and some units below 1 MW), operational performance data may be collected through interval meters or other mechanisms. Long-term growth of DG is extrapolated based on the historical penetration and currently queued projects.

Because non-solar DG units are generally larger than PV projects and are normally dispatched at times of peak load, their impacts on the local grid are greater and depend on several factors. These factors include the size of the DG unit, the redundancy of the local area station, the expected time of go-live, and engineering knowledge of the substation reliability and other local conditions. For the DG forecast, the Company defined the following assumptions to build the forecast model:

- Large DG is defined as having a capacity greater than or equal to 1 MW and small DG as having a capacity less than 1 MW.
- All small DG units are assumed to be on at all times. Therefore, full credit will be taken to reduce load at their stations (and associated networks).

- Large DG units with N-2 redundancy or N-1 redundancy with a spare bank will take full load credit to reduce load at stations (and their associated networks).
- Large DG units with N-1 redundancy without a spare bank will take half of the load to reduce load at their stations (and associated networks).
- All DG jobs in the queue will be included in the base, if they are projected to be completed prior to the current summer experience. If a projected completion date is during or after the current summer experience, the job will be forecasted for the following summer. Each DG project had a performance factor applied (77 percent for large DG and 67 percent for small DG). The DG system forecast in outer years will be divided into networks based on the network's contribution to the DG queue.

Table 32 characterizes the non-solar DG assumptions that determine load reduction credit. DG for each network is rolled up for the system DG forecast.

Table 32: Determination of Non-Solar DG Demand Reduction Credit

			Station Redundancy	
			N-2 & N-1 with a spare bank	N-1
Size and Quantity of DG	Small (<1 MW)	Small DG	Nameplate capacity with performance factor and one year lag from the job completion date	Nameplate capacity with performance factor and one year lag from the job completion date
	Large (>=1 MW)	Large DG	Nameplate capacity with performance factor and one year lag from the job completion date	50% of nameplate capacity with performance factor and one year lag from the job completion date

Once the DG forecast is determined, the inputs are analyzed so that the system forecast displays the rolling incremental growth (in MW). Distributed generation growth from energy storage projects is tracked separately.

In determining the energy forecast load modifier for DG, the Company evaluates only the large (greater than 2 MW) DG units owned by customers taking standby service. The scope prioritizes the standby service rates because of the laborious manual methods to determine the revenues associated with these customers and, as the largest DG units, they have the greatest impact on the energy forecast. The energy forecasting process requires an investigation of the past performance of each unit. For each of the Company's existing standby service accounts, the prior year's usage is reviewed to identify monthly consumption anomalies. For new customers, if available, their past consumption is analyzed to determine the difference between usage and planned on-site generation. In each case, the potential kW generation of the new DG is provided and applied to historical energy/kW ratio to determine the account-specific monthly energy reduction to be applied to the forecast. These account-specific energy reductions are summed by existing service class to determine the energy forecast modifier.

As shown in line 10 of the system forecast (and included below for reference), non-solar DG is expected to contribute an additional 11 MW of load reduction in 2023, ramping to an additional 53 MW of reduction in 2027. The non-solar DG forecast is represented as rolling incremental, where 2023 is an incremental decrease to the system load and each year

thereafter is the reduction of that year and all years prior through 2023. Over the 10-year period, the forecasted cumulative coincident DG MW is 210 MW (349 MW nameplate).

Table 33: Electric System Peak Demand Forecast – Non-Solar DG (MW)

		2023	2024	2025	2026	2027
10	DG (incremental rolling)	-11	-24	-44	-49	-53
	Coincident DG MW (Cumulative)	-141	-154	-174	-179	-183
	% MW Growth	9%	9%	13%	3%	2%

Table 34 shows that DG is expected to contribute 371 GWh of energy reduction in 2020, ramping up to 413 GWh of reduction in 2024.

Table 34: Delivery Volume Adjustments by Service Class – Non-Solar DG (GWh)

Delivery Volume Adjustments (GWh) - Standby Service (DG)		2023	2024	2025	2026	2027
Con Edison	Impact	-313	-323	-323	-323	-323
NYPA	Impact	-58	-99	-213	-331	-444
System	Impact	-371	-422	-536	-654	-767

Energy Storage

Energy Storage is a separate line item in the DG forecast. While storage is still a small component of the forecast, advances in technology will result in many more installed storage devices, particularly batteries, throughout Con Edison territory over time. Energy storage penetration and growth information are derived from the Company's interconnection queue, which provides a near-term view of proposed and under-construction projects.

The Company has identified factors for adoption that it believes will indicate the future pace of distributed energy storage. These signposts include energy storage pricing (by technology type), installed cost, policy treatment (e.g., NEM, value stack, tax credits), and FDNY and NYC DOB permitting, and will be used to inform the forecasting process going forward. The Company is evolving toward a probabilistic approach that incorporates historical growth rates of DER technologies with similar characteristics, such as space requirements, as indicative of storage growth patterns. The Company worked with outside experts on a new forecasting tool that better incorporates new technologies and end-uses, such as energy storage. This new forecasting tool will begin with energy storage and building electrification, and will have the architecture and design in place to allow for future extension to EV, Solar PV, and DG/CHP.

Energy storage systems are a flexible resource in terms of the value they can provide. For example, a 10 MW, four-hour (or 40 MWh) battery can discharge in several ways: 10 MW discharged for 4 hours, 5 MW discharged for 8 hours, or different levels of discharge for varying durations. Battery systems could also target a use case that provides more

consistent output of intermittent renewable sources or flattening the peaks of load curves of customers with highly variable loads. These systems are most predictable when they discharge in a manner set by program rules. For planning purposes, the Company will view the load reduction from the battery as the amount of discharge it can provide over four hours, in line with the network peak load. Thus, a 500 kW reduction from peak would be a 2 MWh battery discharged over 4 hours. The Company understands that a battery system could discharge in a variety of ways and if an incentive mechanism (e.g., DR or program rules) caused the battery discharge pattern to vary from this standard, then the Company could adjust the amount of reduction the forecast includes.

The Company recognizes that several factors require further study, including storage use and charging method. In general, an energy storage resource serves as a load to the utility when it charges from the grid, and serves as a resource to the utility when it discharges. Charging at off-peak times and discharging at peak times generally leads to less carbon-intensive supply sources being utilized and serves to flatten the peak and fill in the troughs for the utility, leading to a better overall load factor and better system efficiency. Energy storage would not serve as a load to the utility if it charges using BTM generation (i.e., solar and battery both behind a one-way inverter). The charging of the battery would not increase the load seen by the utility.

Storage use, and its impact on peak load, varies by intended purpose (*e.g.,* customer-peak shaving, DR, direct utility-control) and size of resource. Customer-peak shaving is dependent on the time of the customer's peak and may not be coincident with utility or NYISO peak. Resources used for customer-specific energy needs may be unavailable at other times.

Other storage uses are measurable and able to be influenced or controlled by the utility (through contracts and/or in real-time). Programs that support a higher level of utility visibility include the REV demonstration projects (VPP and recently issued RFP for energy storage), discussed elsewhere. These programs are administered by the Company and provide greater visibility and impact to peak demand. BQDM and other area-specific NWS have also provided an opportunity for the Company to control an energy storage unit as part of a larger suite of DM projects. Similar RFPs would guarantee coincidence with the Company's greatest need. Depending on storage capacity, technology, and project economics, utility-owned storage projects may also be capable of bidding into NYISO DR and/or ancillary services markets. The Company expects data from these programs to contribute to peak load and energy use impact studies in the coming years.

As shown in line 11 of the system forecast (and included below for reference), batteries are expected to contribute an additional 9 MW of load reduction in 2023, ramping to 187 MW of reduction in 2027, representing a significant increase from prior forecasts.

Table 35: Electric System Peak Demand Forecast - Battery Storage (MW)

		2023	2024	2025	2026	2027
11	Battery Storage (incremental rolling)	-9	-53	-104	-131	-187

The Company currently does not quantify the specific contribution of distributed energy storage to energy reduction due to the limited number of installations and disparate impacts of storage on energy use based on how the storage is charged. For example, charging from the grid would have a positive (additive) impact to delivered energy, while a resource charging from BTM generation would have no impact on delivered energy. Other factors which could affect energy usage are the load curve of customers who adopt distributed energy storage, as well as their charging cycle and frequency, and capacity utilization of the storage resource.

APPENDIX B: ENERGY STORAGE RESOURCES AS OF MARCH 31, 2023

Table 36: Energy Storage Resources as of March 31, 2023

Year Installed	Network Level Location	Total kW	Total kWh	Battery Chemistry	Co-location
2023	Washington Street	6	13	Lithium-ion	Hybrid w/ PV
2023	Washington Street	7.68	6.6	Lithium-ion	Hybrid w/ PV
2023	Buchanan	6	13	Lithium-ion	Hybrid w/ PV
2023	Harrison	6	13	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	5	9.8	Lithium-ion	Hybrid w/ PV
2023	Millwood West	5	9.8	Lithium-ion	Hybrid w/ PV
2023	Harrison	20	54	Lithium-ion	Hybrid w/ PV
2023	Cedar Street	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Harrison	5	9.8	Lithium-ion	Hybrid w/ PV
2023	White Plains	5	5.1	Lithium-ion	Hybrid w/ PV
2023	Millwood West	5	9.8	Lithium-ion	Hybrid w/ PV
2023	White Plains	5	10	Lithium-ion	Hybrid w/ PV
2023	Rockview	3.84	10.08	Lithium-ion	Stand-alone
2023	Millwood West	10	27	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Pleasantville	10.08	10.08	Lithium-ion	Hybrid w/ PV
2023	Rockview	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	5	9.8	Lithium-ion	Hybrid w/ PV
2023	Buchanan	10	10	Lithium-ion	Hybrid w/ PV
2023	Buchanan	5	9.6	Lithium-ion	Hybrid w/ PV
2023	Washington Street	3.84	10.08	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	10	27	Lithium-ion	Hybrid w/ PV
2023	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	3.84	10.08	Lithium-ion	Hybrid w/ PV
2023	Harrison	5	9.8	Lithium-ion	Hybrid w/ PV
2023	Pleasantville	10	27	Lithium-ion	Hybrid w/ PV
2023	Cedar Street	5	13.5	Lithium-ion	Stand-alone
2023	Elmsford No. 2	15	40.5	Lithium-ion	Stand-alone
2023	Washington Street	5.1	15.2	Lithium-ion	Hybrid w/ PV
2023	Northeast Bronx	3.8	10.08	Lithium-ion	Hybrid w/ PV
2023	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2023	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2023	White Plains	10	27	Lithium-ion	Hybrid w/ PV
2023	Cedar Street	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Millwood West	6	9.8	Lithium-ion	Hybrid w/ PV

2023	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Pleasantville	5	13.5	Lithium-ion	Stand-alone
2023	White Plains	5.1	5.1	Lithium-ion	Hybrid w/ PV
2023	Ossining West	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Granite Hill	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Ossining West	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Granite Hill	10	27	Lithium-ion	Hybrid w/ PV
2023	Harrison	7.6	13.5	Lithium-ion	Hybrid w/ PV
2023	Harrison	5	5.1	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	15	40.5	Lithium-ion	Hybrid w/ PV
2023	White Plains	5	13.5	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	10	27	Lithium-ion	Hybrid w/ PV
2023	Elmsford No. 2	15	40.5	Lithium-ion	Hybrid w/ PV
2023	Granite Hill	15	40.5	Lithium-ion	Hybrid w/ PV
2023	Millwood West	10	27	Lithium-ion	Hybrid w/ PV
2022	Washington Street	5	13.5	Lithium-ion	Stand-alone
2022	Elmsford No. 2	10	27	Lithium-ion	Hybrid w/ PV
2022	Buchanan	6	9.8	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2022	Granite Hill	10	27	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	10	27	Lithium-ion	Hybrid w/ PV
2022	Buchanan	5	9.8	Lithium-ion	Hybrid w/ PV
2022	White Plains	5.1	5.1	Lithium-ion	Hybrid w/ PV
2022	White Plains	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Buchanan	7.6	18	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	10	10	Lithium-ion	Stand-alone
2022	Washington Street	3.7	9.8	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	10	27	Lithium-ion	Hybrid w/ PV
2022	White Plains	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Rockview	5	9.8	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	15	40.5	Lithium-ion	Hybrid w/ PV
2022	Millwood West	16	16	Lithium-ion	Hybrid w/ PV
2022	White Plains	3.8	9.8	Lithium-ion	Hybrid w/ PV
2022	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	10	27	Lithium-ion	Hybrid w/ PV
2022	Ossining West	7.68	21	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	6.7	18	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	3.84	13.5	Lithium-ion	Hybrid w/ PV

2022	Ossining West	10	40.5	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	15	40.5	Lithium-ion	Hybrid w/ PV
2022	Flatbush	18	62.5	Lead Acid	Hybrid w/ PV
2022	Pleasantville	6	13	Lithium-ion	Hybrid w/ PV
2022	Grasslands	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Flatbush	8	48	Lead Acid	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Stand-alone
2022	Harrison	5	13.5	Lithium-ion	Stand-alone
2022	Granite Hill	7.6	9	Lithium-ion	Hybrid w/ PV
2022	White Plains	6.8	13	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	31.5	31.5	Lithium-ion	Hybrid w/ PV
2022	Pleasantville	741.2	3.039	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	15.36	40.32	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2022	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Pleasantville	6	13	Lithium-ion	Hybrid w/ PV
2022	White Plains	6	26	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	5	10	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	7.68	20.16	Lithium-ion	Stand-alone
2022	Richmond Hill	18	62.5	Lead Acid	Hybrid w/ PV
2022	Elmsford No. 2	7.6	18	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	40.5	Lithium-ion	Hybrid w/ PV
2022	White Plains	25	67.5	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	9.6	27	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2022	White Plains	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Buchanan	2.56	6.72	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Southeast Bronx	30	91.3	Lithium-ion	Hybrid w/ PV
2022	Ocean Parkway	18	62.5	Lead Acid	Hybrid w/ PV
2022	Granite Hill	4.5	12	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	15.2	40.5	Lithium-ion	Hybrid w/ PV
2022	Jamaica	18	62.4	Lead Acid	Hybrid w/ PV
2022	Pleasantville	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Ossining West	5	5.1	Lithium-ion	Hybrid w/ PV
2022	Harrison	20	54	Lithium-ion	Hybrid w/ PV
2022	Grasslands	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Borough Hall	45	186	Lithium-ion	Stand-alone
2022	Millwood West	10	27	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV

2022	Millwood West	10	27	Lithium-ion	Hybrid w/ PV
2022	Maspeth	18	62.5	Lead Acid	Hybrid w/ PV
2022	Ossining West	5	9.8	Lithium-ion	Hybrid w/ PV
2022	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Millwood West	10	27	Lithium-ion	Hybrid w/ PV
2022	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Buchanan	15	40.5	Lithium-ion	Stand-alone
2022	Millwood West	10	27	Lithium-ion	Hybrid w/ PV
2022	White Plains	5	9.8	Lithium-ion	Hybrid w/ PV
2022	White Plains	50	250	Lithium-ion	Stand-alone
2022	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2022	White Plains	10	27	Lithium-ion	Hybrid w/ PV
2022	Richmond Hill	18	62.4	Lead Acid	Hybrid w/ PV
2022	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Granite Hill	5	13.5	Lithium-ion	Hybrid w/ PV
2022	White Plains	5	5	Lithium-ion	Hybrid w/ PV
2022	Washington Street	7.68	20.16	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Buchanan	5	9.8	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	741.2	2964.8	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	10	27	Lithium-ion	Hybrid w/ PV
2022	Rockview	5	40.5	Lithium-ion	Hybrid w/ PV
2022	Buchanan	5	40.5	Lithium-ion	Hybrid w/ PV
2022	Maspeth	3.84	10.08	Lithium-ion	Hybrid w/ PV
2022	Millwood West	20	50.4	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	14	16	Lithium-ion	Hybrid w/ PV
2022	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2022	Rockview	10	27	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2022	White Plains	11.52	30.24	Lithium-ion	Hybrid w/ PV
2022	Sheepshead Bay	9	68.4	Lithium-ion	Hybrid w/ PV
2022	Granite Hill	10	27	Lithium-ion	Hybrid w/ PV
2022	Buchanan	1	18	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Granite Hill	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2022	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2022	Grasslands	10	9.8	Lithium-ion	Hybrid w/ PV
2022	Rockview	7.6	16	Lithium-ion	Hybrid w/ PV
2022	Washington Street	10	27	Lithium-ion	Hybrid w/ PV
2022	Grasslands	6	27	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	7.6	11.4	Lithium-ion	Hybrid w/ PV

2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	White Plains	7.6	13.5	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	10	Lithium-ion	Stand-alone
2022	Ocean Parkway	9	19	Lithium-ion	Hybrid w/ PV
2022	Millwood West	10	27	Lead Acid	Hybrid w/ PV
2022	Washington Street	6	6	Lithium-ion	Hybrid w/ PV
2022	Buchanan	5	13.5	Lithium-ion	Stand-alone
2022	Cedar Street	15.2	36	Lithium-ion	Hybrid w/ PV
2022	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	6	9.8	Lithium-ion	Hybrid w/ PV
2022	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Buchanan	10	10	Lithium-ion	Hybrid w/ PV
2022	White Plains	500	2000	Lithium-ion	Hybrid w/ PV
2022	Pleasantville	10	27	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	3.8	9.8	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	543.6	2174.4	Lithium-ion	Hybrid w/ PV
2022	Grasslands	5	27	Lithium-ion	Hybrid w/ PV
2022	Buchanan	8.99	9.8	Lithium-ion	Hybrid w/ PV
2022	White Plains	1250	5000	Lithium-ion	Hybrid w/ PV
2022	White Plains	13.5	40.5	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	27	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	19.2	Lithium-ion	Hybrid w/ PV
2022	Ossining West	5.76	9.8	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	3.84	3.8	Lithium-ion	Hybrid w/ PV
2022	Washington Street	20	54	Lithium-ion	Hybrid w/ PV
2022	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Maspeth	1000	1000	Lithium-ion	Stand-alone
2022	Rockview	7.6	10	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	5.76	9.6	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Brighton Beach	9	19	Lithium-ion	Hybrid w/ PV
2022	Pleasantville	10	27	Lithium-ion	Stand-alone
2022	Ossining West	5	27	Lithium-ion	Hybrid w/ PV
2022	Ossining West	7.6	12	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2022	Pleasantville	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Buchanan	5	9.8	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Cedar Street	6	40.5	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2022	Rockview	10	27	Lithium-ion	Hybrid w/ PV

2022	Harrison	20	54	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	27	Lithium-ion	Hybrid w/ PV
2022	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Pleasantville	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Rockview	7.6	18	Lithium-ion	Stand-alone
2022	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2022	White Plains	11.52	30.3	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2022	Pleasantville	10	27	Lithium-ion	Hybrid w/ PV
2022	Grasslands	7.6	7.6	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	10	27	Lithium-ion	Hybrid w/ PV
2022	Elmsford No. 2	7.6	7.6	Lithium-ion	Hybrid w/ PV
2022	Mohansic	5	40.5	Lithium-ion	Hybrid w/ PV
2022	Harrison	5	9.8	Lithium-ion	Hybrid w/ PV
2022	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2022	White Plains	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Harrison	5	27	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	9.6	Lithium-ion	Hybrid w/ PV
2021	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	1000	3000	Lithium-ion	Hybrid w/ PV
2021	Millwood West	1026	4104	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	7.6	7.6	Lithium-ion	Hybrid w/ PV
2021	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	7.6	54	Lithium-ion	Stand-alone
2021	White Plains	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	10	27	Lead Acid	Hybrid w/ PV
2021	Ossining West	10	27	Lithium-ion	Stand-alone
2021	Millwood West	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	3.8	7.6	Lithium-ion	Hybrid w/ PV
2021	Ossining West	6.8	13	Lithium-ion	Hybrid w/ PV
2021	Ossining West	7.6	16	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	6	9.8	Lithium-ion	Hybrid w/ PV
2021	Woodrow	3.84	10.08	Lithium-ion	Hybrid w/ PV
2021	Grasslands	0.5	15.36	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	3.8	9.6	Lithium-ion	Hybrid w/ PV
2021	Grasslands	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Pleasantville	6.8	13	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	210	174	Lithium-ion	Stand-alone

2021	Harrison	6.7	6.7	Lithium-ion	Hybrid w/ PV
2021	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	6.7	18	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	0.5	9.3	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	10	27	Lithium-ion	Hybrid w/ PV
2021	Washington Street	7.6	15	Lithium-ion	Stand-alone
2021	Jamaica	250	243	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	3.8	9.8	Lithium-ion	Hybrid w/ PV
2021	Millwood West	15	4.2	Lithium-ion	Hybrid w/ PV
2021	Buchanan	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	15.2	18	Lithium-ion	Hybrid w/ PV
2021	Pleasantville	3.8	9.8	Lithium-ion	Hybrid w/ PV
2021	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Washington Street	10	13.5	Lithium-ion	Hybrid w/ PV
2021	Millwood West	6.8	13	Lithium-ion	Hybrid w/ PV
2021	Harrison	20	54	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	4.5	12	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	27	Lithium-ion	Hybrid w/ PV
2021	Harrison	7.6	9	Lithium-ion	Hybrid w/ PV
2021	Harrison	5.12	13	Lithium-ion	Stand-alone
2021	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	6.7	18	Lithium-ion	Hybrid w/ PV
2021	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2021	Buchanan	5.12	13	Lithium-ion	Stand-alone
2021	Washington Street	6	9.8	Lithium-ion	Hybrid w/ PV
2021	Pleasantville	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	6.84	13	Lithium-ion	Stand-alone
2021	Ossining West	6	9.8	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	3.8	9.8	Lithium-ion	Hybrid w/ PV
2021	Grasslands	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Washington Street	10	27	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Harrison	15	15	Lithium-ion	Hybrid w/ PV
2021	White Plains	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Buchanan	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Harrison	5	10	Lithium-ion	Hybrid w/ PV
2021	White Plains	5	27	Lithium-ion	Hybrid w/ PV
2021	Millwood West	5.12	13	Lithium-ion	Stand-alone

2021	Ossining West	406	1624	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Granite Hill	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Washington Street	10	27	Lithium-ion	Hybrid w/ PV
2021	Ossining West	3.8	9.8	Lithium-ion	Hybrid w/ PV
2021	Ossining West	7.6	12	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	10	27	Lithium-ion	Hybrid w/ PV
2021	Harrison	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	6	5	Lithium-ion	Stand-alone
2021	Buchanan	6	9.8	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	20	54	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	10	27	Lithium-ion	Hybrid w/ PV
2021	Harrison	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Harrison	6.8	13	Lithium-ion	Hybrid w/ PV
2021	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2021	Grasslands	20	54	Lithium-ion	Hybrid w/ PV
2021	Pleasantville	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	7.6	17.1	Lithium-ion	Hybrid w/ PV
2021	Pleasantville	10	27	Lithium-ion	Hybrid w/ PV
2021	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	20	54	Lithium-ion	Hybrid w/ PV
2021	Harrison	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Ossining West	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Buchanan	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	10	27	Lithium-ion	Hybrid w/ PV
2021	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2021	Washington Street	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Rockview	10	27	Lithium-ion	Hybrid w/ PV
2021	Millwood West	6.8	13	Lithium-ion	Hybrid w/ PV
2021	Harrison	7.6	7.6	Lithium-ion	Hybrid w/ PV
2021	Grasslands	5	27	Lithium-ion	Hybrid w/ PV
2021	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	6.8	13	Lithium-ion	Stand-alone
2021	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Harrison	6.7	18	Lithium-ion	Hybrid w/ PV
2021	Ossining West	5	9.8	Lithium-ion	Hybrid w/ PV

2021	Ossining West	3.4	9	Lithium-ion	Hybrid w/ PV
2021	Granite Hill	10	27	Lithium-ion	Hybrid w/ PV
2021	Rockview	20	54	Lithium-ion	Hybrid w/ PV
2021	Southeast Bronx	1000	1000	Lithium-ion	Stand-alone
2021	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	9.8	Lithium-ion	Hybrid w/ PV
2021	Pleasantville	6.7	18	Lithium-ion	Hybrid w/ PV
2021	Millwood West	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Millwood West	10	27	Lithium-ion	Stand-alone
2021	Millwood West	7.7	27	Lithium-ion	Hybrid w/ PV
2021	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Harrison	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	15	40.5	Lithium-ion	Hybrid w/ PV
2021	Cedar Street	9.8	27	Lithium-ion	Hybrid w/ PV
2021	Granite Hill	15	40.5	Lithium-ion	Hybrid w/ PV
2021	White Plains	10	27	Lithium-ion	Hybrid w/ PV
2021	Fresh Kills	7.68	20.16	Other	Hybrid w/ PV
2021	Buchanan	4.3	13.5	Lithium-ion	Hybrid w/ PV
2021	Mohansic	6.7	18	Lithium-ion	Hybrid w/ PV
2021	Rockview	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Rockview	7	27	Lithium-ion	Hybrid w/ PV
2021	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Pleasantville	15	15	Lithium-ion	Hybrid w/ PV
2021	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2021	Millwood West	15	40.5	Lithium-ion	Hybrid w/ PV
2021	White Plains	15	40.5	Lithium-ion	Hybrid w/ PV
2020	Millwood West	522	1012.8	Lithium-ion	Hybrid w/ PV
2020	Grasslands	4.6	13.5	Lithium-ion	Hybrid w/ PV
2020	Millwood West	15	40.5	Lithium-ion	Hybrid w/ PV
2020	White Plains	144	288	Lithium-ion	Stand-alone
2020	Borough Hall	800	2100	Lithium-ion	Stand-alone
2020	Granite Hill	15	39.6	Lithium-ion	Hybrid w/ PV
2020	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2020	White Plains	10	27	Lithium-ion	Hybrid w/ PV
2020	Buchanan	12.24	40.5	Lithium-ion	Hybrid w/ PV
2020	West Bronx	17.25	48	Lead Acid	Hybrid w/ PV
2020	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2020	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2020	Washington Street	250	548	Lithium-ion	Hybrid w/ PV
2020	Pleasantville	10	27	Lithium-ion	Stand-alone
2020	Buchanan	25	13.5	Lithium-ion	Hybrid w/ PV
2020	White Plains	7.6	27	Lithium-ion	Hybrid w/ PV

2020	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2020	Pleasantville	11.4	54	Lithium-ion	Hybrid w/ PV
2020	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2020	Harrison	11.4	40.5	Lithium-ion	Hybrid w/ PV
2020	Ossining West	7.6	27	Lithium-ion	Hybrid w/ PV
2020	Elmsford No. 2	13.5	13.5	Lithium-ion	Hybrid w/ PV
2020	Harrison	30	30	Lithium-ion	Hybrid w/ PV
2020	Elmsford No. 2	25	27	Lithium-ion	Hybrid w/ PV
2020	Grasslands	5	13.5	Lithium-ion	Hybrid w/ PV
2020	Buchanan	10	27	Lithium-ion	Stand-alone
2020	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2020	Pleasantville	20	54	Lithium-ion	Hybrid w/ PV
2020	Pleasantville	15	40.5	Lithium-ion	Hybrid w/ PV
2020	Northeast Bronx	100	400	Lithium-ion	Stand-alone
2020	Elmsford No. 2	500	2192	Lithium-ion	Stand-alone
2020	Cedar Street	5	13.5	Lithium-ion	Hybrid w/ PV
2020	Buchanan	500	2192	Lithium-ion	Hybrid w/ PV
2020	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2020	Pleasantville	5	13.5	Lithium-ion	Hybrid w/ PV
2020	Elmsford No. 2	250	1096	Lithium-ion	Stand-alone
2020	Elmsford No. 2	250	1096	Lithium-ion	Stand-alone
2020	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2020	Lenox Hill	200	600	Lead Acid	Stand-alone
2020	Cedar Street	10	27	Lithium-ion	Hybrid w/ PV
2020	Elmsford No. 2	18	36	Lithium-ion	Stand-alone
2020	Buchanan	6.6	13.5	Lithium-ion	Hybrid w/ PV
2020	Fresh Kills	1000	1000	Lithium-ion	Stand-alone
2020	Cedar Street	5	13.5	Lithium-ion	Hybrid w/ PV
2020	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2020	Grasslands	10	13.5	Lithium-ion	Hybrid w/ PV
2019	Lenox Hill	125	200	Lead Acid	Stand-alone
2019	White Plains	10	13.5	Lithium-ion	Hybrid w/ PV
2019	Millwood West	5	13.5	Lithium-ion	Stand-alone
2019	Lincoln Square	125	300	Lead Acid	Stand-alone
2019	Granite Hill	8.7	9.8	Lithium-ion	Hybrid w/ PV
2019	Rockview	10	27	Lithium-ion	Hybrid w/ PV
2019	Buchanan	27	13.5	Lithium-ion	Hybrid w/ PV
2019	Elmsford No. 2	27	27	Lithium-ion	Hybrid w/ PV
2019	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Buchanan	10	10	Lithium-ion	Hybrid w/ PV
2019	Pleasantville	5	5	Lithium-ion	Hybrid w/ PV
2019	Yorkville	100	400	Lead Acid	Stand-alone

2019	Granite Hill	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Richmond Hill	2400	8000	Lithium-ion	Stand-alone
2019	Richmond Hill	2400	8000	Lithium-ion	Stand-alone
2019	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2019	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2019	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Millwood West	3.8	13.5	Lithium-ion	Hybrid w/ PV
2019	Rockview	5	13.5	Lithium-ion	Hybrid w/ PV
2019	White Plains	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2019	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Ossining West	10	27	Lithium-ion	Hybrid w/ PV
2019	Lenox Hill	125	300	Lead Acid	Stand-alone
2019	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Ossining West	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Granite Hill	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Washington Street	10	27	Lithium-ion	Hybrid w/ PV
2019	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Ossining West	10	13.5	Lithium-ion	Hybrid w/ PV
2019	White Plains	10	13.5	Lithium-ion	Hybrid w/ PV
2019	Millwood West	10	13.5	Lithium-ion	Hybrid w/ PV
2019	Granite Hill	8	16	Lithium-ion	Hybrid w/ PV
2019	Ossining West	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Cedar Street	5	13.5	Lithium-ion	Stand-alone
2019	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Cedar Street	5	13.5	Lithium-ion	Stand-alone
2019	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Millwood West	15	13.5	Lithium-ion	Stand-alone
2019	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2019	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2019	Lincoln Square	100	400	Lead Acid	Stand-alone
2018	Pleasantville	10	13.5	Lithium-ion	Hybrid w/ PV
2018	Elmsford No. 2	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Fox Hills	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Cedar Street	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2018	West Bronx	18	144	Lead Acid	Stand-alone
2018	White Plains	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Riverdale	125	232	Lithium-ion	Hybrid w/ PV

2018	Ossining West	10	13.5	Lithium-ion	Hybrid w/ PV
2018	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Buchanan	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2018	Harrison	375	750	Lithium-ion	Stand-alone
2018	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Cedar Street	100	400	Lithium-ion	Hybrid w/ PV
2018	White Plains	10	27	Lithium-ion	Hybrid w/ PV
2018	Washington Street	10	27	Lithium-ion	Stand-alone
2018	Granite Hill	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Harrison	36	72	Lithium-ion	Stand-alone
2018	Buchanan	6	13.5	Lithium-ion	Hybrid w/ PV
2018	Granite Hill	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Harrison	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Washington Street	15	30	Lithium-ion	Stand-alone
2018	Washington Street	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Millwood West	5	13.5	Lithium-ion	Hybrid w/ PV
2018	Cedar Street	5	13.5	Lithium-ion	Hybrid w/ PV
2018	White Plains	10	27	Lithium-ion	Stand-alone
2018	Harrison	10	27	Lithium-ion	Hybrid w/ PV
2018	Sutton	100	400	Lead Acid	Stand-alone
2017	Lincoln Square	125	300	Lead Acid	Stand-alone
2017	Midtown West	125	300	Lead Acid	Stand-alone
2017	Millwood West	10	27	Lithium-ion	Hybrid w/ PV
2017	Ossining West	20	54	Lithium-ion	Hybrid w/ PV
2017	Granite Hill	15	30	Lithium-ion	Hybrid w/ PV
2017	Millwood West	15	40.5	Lithium-ion	Hybrid w/ PV
2017	Buchanan	10	27	Lithium-ion	Hybrid w/ PV
2017	Crown Heights	300	1200	Lithium-ion	Stand-alone
2016	Yorkville	100	400	Lead Acid	Stand-alone
2016	Yorkville	100	400	Lead Acid	Stand-alone
2016	Pennsylvania	100	400	Lead Acid	Stand-alone
2016	Fulton	100	400	Lead Acid	Stand-alone
2015	Kips Bay	100	400	Lead Acid	Stand-alone
2015	Hudson	300	288	Lithium-ion	Stand-alone
2014	Granite Hill	27.2	64	Lithium-ion	Stand-alone
2014	Harlem	100	200	Zinc-Manganese	Stand-alone
2014	Rego Park	50	150	Lithium-ion	Stand-alone
2013	Bay Ridge	100	200	Lead Acid	Stand-alone
2013	Park Place	200	400	Lead Acid	Stand-alone
2013	Borden	50	150	Lithium-ion	Stand-alone

APPENDIX C: TOOLS AND INFORMATION SOURCES

Tools and Information Sources by Organization

Resource Name and Link	Topic(s) Covered
Con Edison Utilities Links	
Con Edison: Hosting Capacity – https://www.coned.com/en/business-partners/hosting-capacity	• Advanced Forecasting • Data Sharing • Beneficial Locations for DERs and NWS • Hosting Capacity
Con Edison: Non-Wires Solutions – https://www.coned.com/en/business-partners/business-opportunities/non-wires-solutions	• Beneficial Locations for DERs and NWS
Con Edison: Private Generation Energy Sources – https://www.coned.com/en/save-money/using-private-generation-energy-sources/applying-for-interconnection	• DER Interconnections
Con Edison: Customer Energy Data – https://www.coned.com/en/accounts-billing/share-energy-usage-data/become-a-third-party/faq	• Data Sharing
Con Edison: Electric Vehicles – https://www.coned.com/en/our-energy-future/technology-innovation/electric-vehicles	• Electric Vehicle Integration
Con Edison: Smart Meters – https://www.coned.com/en/our-energy-future/technology-innovation/smart-meters	• Advanced Metering Infrastructure
Con Edison: Energy Storage – https://www.coned.com/en/save-money/rebates-incentives-tax-credits/rebates-incentives-tax-credits-for-commercial-industrial-buildings-customers/energy-storage	• Energy Storage Integration
Con Edison: Cyber Security Policy – https://www.conedison.com/en/about-us/cyber-security-policy	• Data Sharing
Con Edison: Private Generation – https://www.coned.com/en/save-money/using-private-generation-energy-sources/applying-for-interconnection	• DER Interconnections • Beneficial Locations for DERs and NWS
Con Edison: EE Incentives – https://www.coned.com/en/save-money/rebates-incentives-tax-credits	• Energy Efficiency Integration and Innovation • Clean Heat Integration

NY REV and Assorted NY Government Links	
REV Connect: Non-Wires Alternatives Portal – https://nyrevconnect.com/non-wires-alternatives/	• Beneficial Locations for DERs and NWS
Assembly Bill 288: Residential tariff for recharging EVs – http://legislation.nysenate.gov/pdf/bills/2017/A288	• Electrical Vehicle Integration
Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision – http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bB1C7035C-B447-459A-8957-20BF3BDB6D0F%7d	• DER Integration
Case 16-M-0411, In the Matter of Distributed System Implementation Plans – http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B5320DD13-B3D4-4283-92BB-4B3825810215%7D	• DER Integration
Case 16-M-0412, Benefit Cost Analysis Handbook – https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=16-M-0411	• Beneficial Locations for DERs and NWS
Joint Utilities of NY Links	
Joint Utilities: Utility-Specific NWA Opportunities – http://jointutilitiesofny.org/utility-specific-pages/nwa-opportunities/	• Beneficial Locations for DERs and NWS
Joint Utilities: Regulatory and CLCPA Resources – https://jointutilitiesofny.org/regulatory-resources	• Various Topics
Joint Utilities: EV Readiness Framework – https://jointutilitiesofny.org/electric-vehicles	• Electric Vehicle Integration
Joint Utilities: Overview of Currently Accessible System Data – http://jointutilitiesofny.org/system-data/	• Advanced Forecasting • Data Sharing
Joint Utilities: DSP Communications and Coordination Manual – https://jointutilitiesofny.org/sites/default/files/JU_DSP_Comms_Coordination_Manual_DRAFT_2.pdf	• Grid Operations

Joint Utilities: Draft DSP-Aggregator Agreement for NYISO Pilot Program – https://jointutilitiesofny.org/sites/default/files/Draft_JU_DSP_Aggregator_Agreement_NYISO_Pilot_Program.pdf	• Grid Operations
North American Electric Reliability Corporation ("NERC") CIP Reliability Standards – https://www.nerc.com/pa/Stand/Pages/ReliabilityStandards.aspx	• Data Sharing
Other Links	
National Institute of Standards and Technology ("NIST") Special Publication (SP) 800-53, Revision 4 – https://csrc.nist.gov/csrc/media/publications/sp/800-53/rev-4/archive/2013-04-30/documents/sp800-53-rev4-ipd.pdf	• Data Sharing
EPRI: Defining a Roadmap for Successful Implementation of a Hosting Capacity Method for NY State – http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002008848	• Hosting Capacity

List of Related Ongoing Proceedings

- In the Matter of Distributed System Implementation Plans (Includes BCA Handbook) (Case 16-M-0411)
- In the Matter of the Value of Distributed Energy Resources (Case 15-E-0751)
- VDER Working Group Regarding Value Stack (Matter 17-01276)
- VDER Working Group Regarding Rate Design (Matter 17-01277)
- VDER Low Income Working Group Regarding Low- and Moderate-Income Customers (Matter 17-01278)
- Proceeding on Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure (Case 18-E-0138)
- In the Matter of Offshore Wind Energy (Case 18-E-0071)
- In the Matter of Energy Storage Deployment Program (Case 18-E-0130)
- In the Matter of Utility Energy Efficiency Programs (Case 15-M-0252)
- In the Matter of Strategic Use of Energy Related Data (Case 20-M-0082)
- In the Matter of the Utility Energy Registry (Case 17-M-0315)
- In the Matter of Regulation and Oversight of Distributed Energy Resource Providers and Products (15-M-0180)
- In the Matter of Consolidated Billing for Distributed Energy Resources (19-M-0463)
- Whole Building Energy Data Aggregation Standard (Cases 16-M-0411)

- Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and Clean Energy Standard (Case 15-E-0302)
- In the Matter of the Regulation and Oversight of Distributed Energy Resource Providers and Products (Case 15-M-0180)
- In the Matter of Proposed Amendments to the New York State Standardized Interconnection Requirements for Small Distributed Generators (Case 18-E-0018)
- In the Matter of the Federal Energy Regulatory Commission (FERC) Order Nos. 2222 and 841, to Modify Rules Related to Distributed Energy Resources, Tariff Proposal Pursuant to FERC Order Nos. 2222 and 841 (22-E-0549)
- In the Matter of Comprehensive Energy Efficiency Initiative (NENY Proceeding) (18-M-0084)
- In the Matter of Renewable Energy Facility Host Benefit Program (20-E-0249)
- Dynamic Load Management Programs (Cases 14-E-0423 and 15-E-0189)
- Proceeding on Motion of the Commission Regarding Cyber Security Protocols and Protections in the Energy Market Place (18-M-0376)
- Proceeding on Motion of the Commission to Enable Community Choice Aggregation Programs (14-M-0224)
- Proceeding on Motion of the Commission to Examine Utilities' Marginal Cost of Service Studies (19-E-0283)
- Proceeding on Motion of the Commission to Address Barriers to Medium- and Heavy-Duty Electric Vehicle Charging Infrastructure (23-E-0070)
- Proceeding to Establish Alternatives to Traditional Demand-Based Rate Structures for Commercial Electric Vehicle Charging (22-E-0236)
- Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act (20-E-0197)
- Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision (14-M-0101)
- Proceeding on Motion of the Commission to Implement the Requirements for the Utility Thermal Energy Network and Jobs Act (22-M-0429)
- Proceeding on Motion of the Commission Regarding Strategic Use of Energy Related Data (20-M-0082)
- Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio (07-M-0548)
- Proceeding on Order of the Commission Concerning Electric Utility Climate Vulnerability Studies and Plans (22-E-0222)
- In the Matter of Consolidated Billing for Distributed Energy Resources (19-M-0463)
- Proceeding on Motion of the Commission to Consider Resource Adequacy Matters (19-E-0530)
- Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn/Queens Demand Management Program (14-E-0302)