COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 21-80

DIRECT TESTIMONY OF

JENNIFER A. SCHILLING,
JESSICA BRAHANEY CAIN,
AND
ROBERT W. FRANK

EXHIBIT ES-AMI-1

IN SUPPORT OF
NSTAR ELECTRIC COMPANY
d/b/a EVERSOURCE ENERGY

July 1, 2021

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Jennifer A. Schilling. My business address is 247 Station Drive, Westwood, Massachusetts 02090.

Q. By whom are you employed and in what capacity?

A. I am employed by Eversource Energy Service Company ("ESC") as Vice President of Grid Modernization for the Eversource Energy operating companies, including NSTAR Electric Company d/b/a Eversource Energy ("Eversource" or the "Company"). As Vice President of Grid Modernization, I am responsible for the Company's Grid Modernization Plan ("GMP") development, GMP investment portfolio management, as well as the coordination and implementation of the GMP investment programs. I am responsible for developing strategies to increase the capacity of the Company's distribution system to optimize the integration of distributed energy resources, while improving the safety, security, reliability, and cost-effectiveness of the system.

Q. Please describe your education and professional background.

A. I graduated with a Bachelor of Arts degree in environmental science and political Science from Barnard College, Columbia University in 1995. In 2001, I earned a Master of Business Administration from Duke University. From 2001 to 2008, I held several positions at Reliant Energy in Houston Texas, ending my tenure in the position of Director, Corporate Strategy. In 2008, I joined the Northeast

Utilities System as the Director of Business Planning for Western Massachusetts Electric Company ("WMECO"). I subsequently accepted the role of Director, Asset Management for WMECO and then Director, Distribution Engineering for Eversource, prior to assuming my current role.

Q. Have you previously testified in any formal hearings before regulatory commissions?

A. I have previously testified as a witness on behalf of the Company before the Department of Public Utilities (the "Department"). I have appeared on behalf of the Company at various technical sessions and evidentiary hearings on grid modernization-related issues and distribution planning matters as part of different proceedings, including the Company's most recent base distribution rate case, D.P.U. 17-05, and the Company's first GMP proceeding, D.P.U. 15-122.

Q. Please state your name and business address.

A. My name is Jessica Brahaney Cain. My business address is 107 Selden Street, Berlin, Connecticut.

Q. By whom are you employed and in what position?

A. I am the Vice President, Customer Operations for Eversource Energy Service Company ("ESC"). ESC provides centralized services to the natural gas and electric operating subsidiaries of Eversource Energy, including the Company. In this role, I have overall responsibility for customer contact centers, billing,

payment, meter reading and collections in Massachusetts, Connecticut, and New Hampshire.

Q. Please describe your educational background and employment experience.

A. I have 26 years of experience in the energy industry across North America delivering on customer strategy, best practice driven operational excellence, customer experience design, project management and technology change integration. I joined Northeast Utilities as the Director, Enterprise Strategy in 2007. In that role, I led the smart-metering strategy and supporting the dynamic pricing customer pilot. Prior to joining Northeast Utilities, I held various leadership roles within NSTAR Electric & Gas Co., The Structure Group and Accenture. At NSTAR, I was the IT Director responsible for Customer and Energy Supply areas. I led initiatives on deregulation-related energy market change at various energy companies and independent market operators in California, Texas, Oklahoma, and Canada while at The Structure Group. I began my professional career at Accenture, where I became a team lead in a four-year project to consolidate Southern Company's customer systems into a new Customer Information System.

I hold a Bachelor of Arts degree in policy studies from Syracuse University, Maxwell School of Citizenship and Public Affairs.

Q. Have you previously testified in any formal hearings **before regulatory commissions?**

A. I have testified before the Department, most recently in D.P.U. 17-05, the Company's most recent base distribution rate proceeding. I have previously testified in proceedings before the Connecticut Public Utilities Regulatory Authority ("PURA"), including on issues related to energy affordability (Docket No. 17-12-03RE01), customer arrearage programs (Docket No. 20-07-04), and submitted pre-filed testimony on the low-income rate (Docket No. 17-12-03RE11).

Q. Mr. Frank, please state your name, position, and business address.

A. My name is Robert W. Frank. I am the Director, Revenue Requirements, Massachusetts for Eversource Service Company. My business address is 247 Station Drive, Westwood, Massachusetts 02090.

Q. In your current role, what are your principal job responsibilities?

A. In this position, I am responsible for the coordination and implementation of revenue requirement calculations in various regulatory cost recovery filings for the Massachusetts operating subsidiaries of Eversource Energy, including the Company and NSTAR Gas Company d/b/a Eversource Energy ("NSTAR Gas Company"). I have overall responsibility for all revenue requirement-related filings before the Department.

Q. Please describe your education and professional background.

A. I graduated from the University of Massachusetts - Dartmouth in North Dartmouth,

Massachusetts in 1980 with a Bachelor of Science degree in Accounting. I graduated from Providence College in 1988 with a Master's in Business Administration degree. I was hired by the Company as a Principal Financial Analyst in April 1998 and was responsible for the development of the Company's Annual Financial Operating Plan. I have held a variety of positions at Eversource, including Manager of Investment Planning, and have 22 years' experience in the industry. I was promoted to Director of Revenue Requirements in November 2019.

Q. Have you previously testified before any regulatory body?

A. Yes. I sponsored testimony before the Department in D.P.U. 20-54 and D.P.U. 21-58, the Company's 2019 and 2020 Grid Modernization Cost Recovery filings.

Q. Please describe the purpose of your testimony.

A. Our testimony addresses the Company's planned Advanced Metering Infrastructure ("AMI") investments and implementation schedule, which is designed to provide the appropriate platform for the Company to continue to modernize its distribution system consistent with the Department's grid modernization goals and the Commonwealth's energy and environmental policies, as well as meet the changing needs of customers. Given the significance of these investments, both in size and in scope, as well as the multi-year investment schedule, our testimony also details the Company's proposal regarding the cost recovery mechanism that is best suited for such an all-encompassing investment plan. As discussed below, the Company's AMI investment proposal and schedule is designed to meet the changing industry

landscape and evolving customer expectations to substantially contribute to the Commonwealth's energy and environmental goals.

Eversource works continuously to support the Commonwealth's critical energy and environmental goals, including the continued modernization of the electric grid, offering award-winning energy efficiency programs, an innovative energy storage deployment industry-leading electric vehicle make ready offerings, and contracts with renewable energy resources. Enabling a cleaner energy future requires strategic focus on increasing visibility and optimization of the distribution system. Widespread visibility of power flows is a prerequisite to optimizing real-time system conditions to capture the time and location-based value of clean energy resources. Transition to AMI is critical to maintaining these efforts. The Company's existing Automated Meter Reading ("AMR") meters are rapidly nearing the end of their useful life. Were the Company to reinvest in AMR meters, as opposed to AMI as proposed, it would significantly detract from the Company's ability to continue to make substantial progress in modernizing the distribution system and enabling a cleaner energy future.

The electric distribution grid is embarking on a period of technological transformation. For much of its history, the grid was characterized by relatively predictable loads and one-way power flow from the transmission system to customers. System operations were largely manual and visibility into real-time

conditions was limited. Power delivery traditionally occurred with little or no involvement from the customer, and with little or no interaction with customer-owned equipment.

Advances in technology, combined with policy support for clean energy solutions, are driving fundamental changes in how power is generated, distributed, and consumed. Increasingly, customers are both producers and consumers of electricity. The proliferation of intermittent solar generation and other distributed energy resources ("DER") is increasing the prevalence of two-way power flow. Growing penetration of electric vehicles ("EVs") and other electrification initiatives are further changing the nature of supply and demand. Deployment of automated devices with "self-healing" capability through the Company's GMP has greatly amplified the complexity and dynamic nature of grid operations. System operators are increasingly challenged to provide safe and reliable service managing continually fluctuating power flows driven by both load and DER.

Looking forward to a future defined by increased penetration of DER, EVs, energy efficiency and other beneficial electrification, the electric distribution system is at an inflection point. With strategic, cost-effective investments in grid modernization, opportunities exist to reduce peak demand, increase system efficiency, improve reliability, and support overall resiliency of the grid. Absent this concerted effort to support optimization, risks associated with power quality

events, reliability degradation and higher costs associated with increasing peak demand will grow over time.

Additionally, the Company, along with the industry, is experiencing pressure to meet customer expectations that are being formed by customer experiences with other goods and services vendors increasingly supported by digital technology allowing for quick and easy customer-service interfaces, among other advancements. AMI is critical to meeting these customer expectations and will provide an enhanced customer experience with a wide variety of benefits, including enabling customers to make more informed choices about their energy usage and choices.

The confluence of these factors is driving a need to make enabling investments that provide the grid edge visibility necessary to support a broad spectrum of the continuing grid modernization efforts. The Department, in its decision in Investigation by the Department of Public Utilities on its own Motion into the Modernization of the Electric Grid - Phase II, recognized that: (1) the Company is "[a]t a critical juncture regarding [its] metering infrastructure;" and (2) the current state of the Company's AMR meters offers an ideal opportunity to craft comprehensive meter replacement plans. D.P.U. 20-69-A, at 25-26 (May 21, 2021) ("D.P.U. 20-69-A"). Based on these findings, the Department stated its intent to focus on the achievement of advanced metering functionality in support of its grid

modernization objectives and the Commonwealth's long-term energy policies through a full-scale deployment of AMI. Id. at 27.

In light of the Department's findings and consistent with the directives contained in D.P.U. 20-69-A, the Company is providing the Department with its planned AMI investments, including the necessary supporting back-office systems, and implementation schedule. The Company is also providing information on its preliminary customer education and outreach plans designed to ease customer adoption and change management.

Q. Are you presenting any exhibits in support of this joint testimony?

A. Yes. We are presenting the following exhibits in support of this joint testimony:

Exhibit ES-AMI-1	Joint Direct Testimony of Jennifer A. Schilling, Jessica Brahaney Cain and Robert W. Frank
Exhibit ES-AMI-2	Eversource AMI Implementation Plan
Exhibit ES-AMI-2, Appendix A	Eversource AMI Project Components, Preliminary Budget, and Schedule
Exhibit ES-AMI-2, Appendix B	Eversource AMI/GMP Cybersecurity Plan
Exhibit ES-AMI-2, Appendix C	Eversource AMI Customer Engagement Plan
Exhibit ES-AMI-3	Eversource AMI Industry Assessment
Exhibit ES-AMI-4	Eversource AMI Business Case Analysis
Exhibit ES-AMI-5	Model AMI Tariff
Exhibit ES-AMI-6	Model AMI Opt-Out Tariff

II. EVERSOURCE BACKGROUND REGARDING IMPLEMENTATION OF AMI

Q. Has the Department previously explored the deployment of AMI in Massachusetts?

A. Yes. In October 2012, the Department initiated an inquiry to inform the approach to grid modernization over the short-, medium- and long-term. Modernization of the Electric Grid, D.P.U. 12-76 (2012) ("D.P.U. 12-76"). As part of that inquiry, the Department sought to develop policies that would provide electric distribution companies ("EDCs") with the guidance and flexibility to implement grid modernization technologies and practices to enhance reliability, reduce electricity costs, empower customer to better manage usage, and support a clean, more efficient electric system. D.P.U. 12-76, at 5.

In subsequent decisions, the Department identified specific grid modernization objectives and set forth a policy framework for the review of grid modernization investments. See, generally, D.P.U. 12-76-A (2013); D.P.U. 12-76-B (2014); D.P.U. 12-76-C (2014); see also Time Varying Rates, D.P.U. 14-04-C (2014) ("D.P.U. 14-04"). The Department required each EDC to submit a GMP outlining how each company proposed to make measurable progress towards the grid modernization objectives, including proposals regarding Advanced Metering Functionality ("AMF") and its role in advancing the grid modernization objectives. D.P.U. 12-76-B at 9, 15.

Consistent with the Department's directives, Eversource submitted its proposed GMP on August 15, 2015, to commence investments to modernize the electric distribution system and enable the continued provision of safe and reliable service to customers at a reasonable cost. NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 15-122 (2018).[1] The Company's 2018-2020 GMP included a proposed Opt-In Time-Varying-Rates ("TVR") proposal designed to optimize demand in a cost-effective and reasonable way for the benefit of customers. In light of various circumstances including the business operating requirements, evolution of information technology systems and other contributing factors at the time the Company developed its TVR proposal in 2015, a full roll-out AMI did not present itself as a cost-effective solution to the Department's directives in D.P.U. 12-76 and D.P.U. 14-04. The Company, through its comprehensive analysis, determined that, at that time, there was no cost justification for implementing AMI, and that it was currently too expensive to justify the modest gain in functionality. D.P.U. 12-76-B, Appendix 1, at 7.

In its May 10, 2018 decision in D.P.U. 15-122, the Department determined that it needed to reassess its strategies for the deployment of AMF to maximize the

1 On May 12, 2020, the Department extended the current three-year grid modernization plan investment term through calendar year 2021 Grid Modernization, D.P.U. 15-120-D/D.P.U. 15-121-D/D.P.U. 15-122-D at 7 (2020). On February 4, 2021, the Department approved a supplemental budget for calendar year 2021 for Eversource's GMP investments. NSTAR Electric Company d/b/a Eversource Energy, D.P.U. 20-74, at 33-34 (2021).

benefits for Massachusetts customers. D.P.U. 15-122, at 1. Based on its review of the EDCs' 2018-2020 GMPs, the Department determined that the benefits of a full deployment of AMF did not justify the costs. Id. at 2. The Department held that the deployment of AMF remained an important tool in meeting grid modernization objectives and that further investigation would be conducted to enable a successful future deployment of AMF where the benefits of the technology are certain and justify the costs. Id. at 3.

Q. Has the Department revisited AMI deployment in Massachusetts?

A. Yes. On July 2, 2020, the Department issued an order opening an investigation to explore whether a targeted deployment of customer-facing technologies to EV customers, including residential, low-income, and commercial and industrial ("C&I") customers, as well as EV charging site hosts, was appropriate. Investigation by the Department of Public Utilities on its own Motion into the Modernization of the Electric Grid – Phase Two, D.P.U. 20-69 (2020) ("D.P.U. 20-59" or "Phase Two Proceeding"). The Department indicated that its investigation would include a full range of cost-effective options in addition to standard AMI technology. D.P.U. 20-59, at 6. Specifically, the Department stated that it expected that, at a minimum, a targeted deployment of AMF to basic service EV customers would help establish the groundwork for future deployment of AMF to other customer segments. Id. The Department also stated that it would investigate

potential TVR designs for EV customers receiving basic service and will consider whether TVR for these customers should include both supply and distribution rates. Id. at 6-7.

In responding to the Department's request for comments, the Company noted that it and its affiliates have extensively evaluated opportunities for deployment of AMF and determined that deployments targeting a subset of customers are the least cost-effective avenue for deployment (D.P.U. 20-69, Eversource Initial Comments at 5). The significant investment required to build a communications network, develop new meter data management system (MDMS), and develop new billing capabilities to realize more sophisticated TVR designs does not vary significantly depending on the number of meters deployed (id.). Thus, the Company determined that the full deployment of AMI to achieve AMF represented the best path forward for achieving the Department's stated goals (id. at 17-20).

Following its review of comments submitted by the Company, the other EDCs, and various stakeholders, as well as information provided at technical sessions, the Department determined that a targeted deployment of AMI to EV customers was not likely to be cost-effective. D.P.U. 20-69-A, at 25. Instead, in consideration of the Commonwealth's long-term energy policy and climate goals, as well as the current status of the EDCs' metering infrastructure, the Department determined that it was appropriate to consider a path to achieve AMF through a full-scale

deployment of AMI. Id. Specifically, the Department found that a significant portion of the Company's current meters will reach the end of their useful life within the next three to six years and that this offers an ideal opportunity to craft comprehensive meter replacement plans, including the necessary upgrades to back-office supporting systems necessary to enable AMF through AMI meters. Id. at 26-27; see also D.P.U. 20-69-A, at 6; D.P.U. 20-69 Eversource Initial Comments at 11-20).

Accordingly, the Department directed the Company, as well as the other EDCs, to include in its 2022-2025GMP a proposal to achieve AMF through a full-scale deployment of AMI, including a specific time period for achieving full deployment and incorporating the requisite back-office support systems, including an MDMS and customer system, and a detailed end-of-life meter replacement plan. D.P.U. 20-69-A, at 29, 33-34.

The Department indicated that, during its review of the 2022-2025 GMPs, it would consider the appropriate method to recover costs associated with the proposed AMI deployment. D.P.U. 20-69-A, at 34. Specifically, the Department directed the Company to demonstrate whether foundational investments, such as MDMS and communications infrastructure, are appropriate for short-term, targeted cost recovery or other alternative ratemaking treatment. Id. at 35. Consistent with these and other Department directives contained in D.P.U. 20-69-A, we are providing the

Department, for its review, the Company's proposed AMI deployment.

Q. Have the Company's operating affiliates deployed AMI?

A. Connecticut Light and Power ("CL&P") filed a comprehensive business and implementation plan on July 31, 2020. CL&P's proposal is still under review by "PURA. Public Service of New Hampshire ("PSNH"), in its most recent base distribution rate proceeding settlement, committed to conduct a feasibility study of AMI deployment in New Hampshire.

Enabling AMI deployment across all three Eversource Energy electric distribution operating companies will provide benefits to Massachusetts, as well as Connecticut and New Hampshire, including but not limited to efficiencies in issuing Requests for Proposals ("RFPs"), lessons learned and best practices and cost efficiencies in retention of third-party contractors and equipment procurement. Synergies may arise related to the cost and benefits associated with major back-office systems that provide critical foundational support for the AMI meters. Eversource has long recognized the value associated with designing enterprise IT systems used across to support all affiliates. Designing one system reduces total implementation costs, including resources required for planning and procuring the vendor solution. The Company is also in a better position to negotiate lower cost licenses and ongoing maintenance and support services.

There are also benefits of using one system across affiliates related to training and consistent processes. The Company's enterprise outage management system ("OMS"), for instance, is used by all electric companies enabling trained users to seamlessly support restoration efforts in any state. The Company expects that, over time, its gas and electric affiliates in Connecticut and New Hampshire will transition to the same enterprise MDMS and customer information system ("CIS") as the one used selected to support the AMI deployment in Massachusetts.

The Company expects that deployment of an AMI system for Massachusetts electric customers will have benefits for its Eversource Energy affiliates in Massachusetts. The implementation of a communications network capable of transmitting meter and sensor data to and from all electric residential and commercial meters in Massachusetts has the potential to be leveraged by the Company's gas affiliate, NSTAR Gas Company. Currently, NSTAR Gas Company's meters are read by a drive-by AMR system. The Company expects to design a communications network that could also be used to support gas AMI and modern gas sensing capabilities, such as methane detection for safety and cathodic protection systems to address gas leaks. Advances in gas smart meter technology, including remote disconnect for safety purposes, are increasing the value proposition of transitioning away from current AMR meter technology. Approximately 35 percent of NSTAR Gas Company's gas meters and

infrastructure overlap with the Company's electric service territory in Massachusetts.

III. EVERSOURCE AMI DEPLOYMENT PROPOSAL

Q. Why is the Company proposing to deploy AMI at this point?

A. The Company is proposing to deploy AMI, as described below, because it represents a technology-driven evolution that will enhance the services the Company offers its customers, the Company's operations, and its continued ability to meet the Department's grid modernization goals, as well as other critical Commonwealth energy and environmental policies. For over 13 years, the electric power industry has been transitioning its customer meter inventory from manual and drive-by meter reading technology to AMI systems that collect detailed usage data in granular increments via a wireless communications system, providing the foundation for transformational customer and utility operating insights.

At the time of the Department's investigation in D.P.U. 12-76 and its subsequent order in D.P.U. 15-122, the transition to AMF was a very significant departure from the Company's normal course of business, involving the need for the Department's intervention to establish the "cost effectiveness" of the investments to be made to warrant adoption of the technology over other prevailing metering technologies. Now, almost 10 years later, the ongoing evolution of technology has made the installation and use of AMI the only feasible operating alternative as compared to

other technological solutions, with the potential to produce benefits for customers, if implemented in an organized, comprehensive and carefully sequenced process. Therefore, while the implementation of AMI is becoming part of the natural progression of the operating platform, the need for supportive cost recovery over the multi-year implementation process is critical to further this operating progression.

Customer needs and expectations regarding their electric service have evolved consistent with their adoption of customer-owned DER, purchase and use of EVs, exploration of battery storage, and participation in energy efficiency and load management programs, as well as a general desire to better manage electricity usage. The grid has evolved from the days where the Company only needed to contend with one-way power flows. The Company and its customers now exist in a world where the Company needs to contend with and effectively and safely manage two-way power flows, including all the communication that needs to accompany that responsibility.

As the Company approaches a point in time where its AMR metering infrastructure nears the end of its useful life, AMI presents the only replacement solution that can ensure that the Company is able to manage its distribution system effectively and safely for its customers. There are no alternatives to AMI – it is the only metering solution available to effectively manage and interact with the modern grid. If the

Company were to continue to deploy AMR meters on its system, it would be locking itself and its customers into a 20-year lifecycle of outdated technology that is inconsistent with customers' expectations of the modern and evolving grid as it stands today and as the Company's envisions and plans for its future state.

Q. What are some of the benefits associated with AMI?

A. There are significant benefits for customers associated with the deployment of AMI. Full deployment of AMI for all Massachusetts customers would enable the following categories of benefits:

- **Improved Customer Service** – Under AMI, Customers will be able to see the data on their usage relatively close in time to their actual usage experience. The customers will have access to detailed usage data and other useful information and alerts via multiple communications channels. This lens into individual usage will be invaluable to a customer service representative ("CSR") who is assisting a customer concerned on high bills. Data from AMI will allow the CSR to walk a customer through their usage at a granular level and point out potential ways to reduce usage and save on their monthly bill. Additionally, with AMI, customers will be able to schedule service connections and disconnections, which is valuable to the customer in terms of conveniently and effectively managing their own schedules while simultaneously ensuring that their service needs are met. Further, with the greater knowledge of customer usage achieved under AMI, personalized energy management suggestions can be provided to the customer. Improved outage communications enabled by AMI is another source of value for customers. All of these benefits improve customer service, which in turn improves customer satisfaction with the service they are receiving. Further, the benefits listed below will also serve to improve customer service and their satisfaction with the service they are receiving.

- **Energy Efficiency and Demand Response Participation** – Data available from AMI will enable more sophisticated targeting of customers likely to benefit from the Company's energy efficiency programs.

- **Reliability** – With its current AMR technology, the Company is dependent on customer call patterns to support restoration activities. Two-way

communications and "last gasp" technology enable system operators to confirm service at individual meters. This capability is particularly important in major events, where AMI can identify "nested" outages reducing the duration and complexity of events. Granular data will also support pro-active identification of equipment overload conditions.

- **System Efficiency** – Improved grid-edge visibility will enhance the effectiveness of Volt VAR optimization schemes, leveraging investments in distribution equipment and control systems to deliver increased energy and demand savings.

- **Support for Grid Modernization** – Data available from AMI will improve the ability of system planners to prioritize upgrades and forecast the impact of distributed energy resources. System operators will have access to improved load flows based on more detailed and accurate customer load data, increasing the functionality of distribution and distributed energy resource management systems.

- **Lowering Shared Costs** – AMI can help reduce costs currently passed on to all customers. Theft and non-technical line losses, for instance, can be effectively identified using AMI data analytics and remote turn-on and turn-off capabilities. Improved efficiency in the credit and collection process has the potential to reduce bad debt expense shared by all customers.

- **Indirect Customer Savings** – The Company will improve operational efficiency in areas such as meter reading, turn-on and turn-off activities (performed consistent with the Department's regulations and practices) and bad debt expense. The communications network required to support AMI is also capable of transmitting data from non-mission critical data such as line sensors. In areas of overlapping service territory, the AMI network can support communication of the Company's gas meters to support an eventual transition to gas smart metering.

- **Demand Management** – increasingly, as consumers participate in behind the meter demand management programs, the benefit of near-real time usage will help them optimize their participation. AMI will provide the data and tools to assist customers in optimizing their usage. EV customers are a perfect example of a customer segment that will benefit from AMI. The ability for EV customers to see their usage in near-real time and to take informed actions to control their energy costs is one of many benefits of advanced metering. Advanced metering provides the necessary data to observe changes in customer load and the time of load usage to identify potential EV customers. This data

can then be used to provide targeted and efficient customer communication, awareness, and acquisition.

Q. Please describe the Company's current metering system.

A. The Company is currently using drive-by automated meter reading AMR meters with an average useful life of 20 years. The majority of existing AMR meters were deployed in 2000 through 2006. As a result, over the next six years, approximately 740,000 meters will be over 20 years old.

Specifically, the Company uses a radio frequency ("RF")-based AMR technology that automatically collects readings remotely from most of its customers. AMR meters are read by AMR-equipped vans using the Company's Field Collection System ("FCS") Mobile Collection System. The readings are then exported out of the FCS and sent to the respective billing systems.

The type of information that can be collected using FCS will vary whether using a single Encoder Receiver Transmitter ("ERT") meter or a multi-ERT meter and is also impacted by how the meter is programmed. The type of information collected includes kWh total, kW demand, kWh on-peak and kWh off-peak.

The Company uses interval meters for approximately 10,000 of its largest commercial and industrial ("C&I") customers. Interval reads are collected via cellular communications and modems using its MV90xi data collection system. The data is verified, exceptions are validated, estimated, and edited ("VEE") by

employees and monthly billing determinants are provided for billing purposes. Interval data is transferred to various downstream systems for additional tasks such as ISO reporting and monthly load reconciliation.

FCS and MV90xi systems have limited two-way communication capabilities. MV90 calls meters and collects data. With certain meter types, FCS can read/reset demands and turn meters off and on remotely if an Itron Security Management System is partnered with the FCS system.

The MV90xi system is capable of limited data management however the majority of VEE is manual, and the system has limited capacity. The Company does not have separate meter data management system that processes interval data.

Q. Has the Company provided its AMI deployment proposal?

A. Yes. A modern AMI deployment reflects the imperative to consider AMI as more than meters and communications infrastructure but rather as a complete system, inclusive of systems and integrations that together will unlock the full potential of this technology. The Company is providing the Eversource Massachusetts AMI Implementation Plan (the "AMI Plan" or "Plan") as Exhibit ES-AMI-2, which provides a detailed explanation of the proposed AMI deployment.

As depicted in Exhibit ES-AMI-2, a comprehensive approach to AMI deployment for Eversource customers is inclusive of meters, communications, a Headend

System ("HES"), an MDMS and CIS, as well as customer engagement systems and integration to the Company's existing OMS and platforms to enable engineering analytics with an overlay of Cybersecurity on all these components. A third-party review of industry trends and technology maturity commissioned by the Company supports the conclusion that this type of comprehensive deployment of AMI is the necessary course of action to transition away from existing aging meter infrastructure and associated systems.

The Plan provides a detailed description of the optimal path forward towards a cost-effective full deployment of AMI for all 1.4 million residential and small commercial electric customers. The Plan includes sections outlining the steps the Company will follow to ensure execution is well-planned, efficient, cost-effective and incorporates principles of risk and change management.

Q. Please describe the various components of the Plan.

A. When reviewing the Plan, which is included as Exhibit ES-AMI-2, it is helpful to recognize that the investments must be carefully and methodically sequenced to extract the full value of the various AMI functionalities. Exhibit ES-AMI-2, Appendix A provides the various investment bundles, along with the preliminary budgets and schedule, that comprise the AMI and associated foundational system investments.

The single largest investment category under the Plan are the AMI meters. Meters

must be supported by certain foundational investments to enable the full functionality of the AMI meters. The AMI meters will need to be backstopped by a new CIS, which will be used to track customer information and render bills to customers. The current CIS systems, one that serves Western Massachusetts (legacy WMECO) ("WMA") and one for Eastern Massachusetts (the Company) ("EMA") are not equipped to bill complex rates, i.e., TVR. Failure to invest in a new CIS will mean that the Company, and by extension its customers, will be unable to access significant benefits associated with the AMI meters.

An updated communications network and HES are also critical in ensuring that the Company and customers can access the full value of the AMI meters. AMI technology uses wireless telecommunications for the collection of meter data. AMI meter consumption data is typically collected twice a day. Daily collection of usage data enables the Company to offer customers various programs and information to incentive energy usage reduction and other benefits. The AMI communications network also enables firmware upgrades over the air, eliminating the need to physically visit meters to perform updates. The AMI meters, which contain communications modules, communicate back to Eversource via a wireless network. The Company expects that a hybrid approach, utilizing a private wireless "mesh" network coupled with public carrier cellular networks, is likely to be the most effective technology for its electric AMI telecommunications network needs.

Following approval of the decision to proceed with AMI, the Company will conduct a formal request for proposal to select the best technology solution to meet communications network requirements.

The timing of the investment in the communications network and HES are critical. The Company cannot deploy the AMI meters until the updated communications network is in place, tested and operational. Absent the updated communications network, the Company will have no way to collect the data from the AMI meters, which negates the significant benefits associated with the meters' data collection and other functionalities, such as being able to determine whether customers have power following an emergency event like a storm.

The communications investment bundle will likely include the meters and HES. The HES decrypts incoming meter data to be used in other systems and encrypts outgoing meter commands, ensuring the AMI system is secured end-to-end, e.g., advanced meter functions like service switch reconnections and pinging of the meters to confirm outages or service restorations status. The purpose of the HES is not to store or process the meter data, but rather to pass the decrypted data to specialized systems like the MDMS. The MDMS is the system that houses all the data collected from the meters. The data is transferred from the HES to the MDMS, which processes meter data into information that can be used by other back-office systems such as the CIS and

OMS. The core MDMS functionality includes Validating, Estimating and Editing ("VEE") meter reads before the reads are passed on to the CIS. The MDMS also filters power off/on notifications during large-scale outages to avoid overwhelming the OMS. The MDMS can also perform some basic analytics and will be able to provide rudimentary reports around theft and tamper detection. The customer portal, which is discussed below, will utilize the meter data housed in the MDMS to provide customers with their usage data to enable them to make informed choices about usage.

The third investment bundle in the deployment plan comprises engineering and analytics tools. One of the key lessons the Company has learned from other utilities that have deployed AMI is that these massive amounts of data collected by the meters has a significant value, given the various analyses that utilize the data. This investment bundle addresses the cloud-based computation and analysis of this data, as well as the storage of the data.

Cybersecurity investments and enhancements are also a component of this third investment bundle. The Company has included information on its AMI/GMP Cybersecurity Plan in Exhibit ES-AMI-2, Appendix C. Deploying AMI meters and the associated network and systems to connect these devices and collect, analyze, and store the data will require adding multiple layers of security to ensure that customer data is kept secure. Measures to enhance the confidentiality, integrity and

availability of data are also part of this bundle and the Company will implement additional cyber protection measures as it develops additional customer-oriented analytics use cases.

The fourth investment bundle is associated with the customer portal that will allow customers to access, review and interact with their individual usage data. Eversource is committed to creating value for customers by developing an enhanced web portal to provide access to granular energy usage data. This access will enable customers to leverage their usage information to gain insights about their energy use and turn those insights into action. Specifically, Eversource will design the portal to:

- Provide more transparent, real-time data for customers to act on that will allow the Company to seamlessly deliver the right value-added program/message to the right customer at the right time related to their energy account and usage.
- Provide analytics of customer usage behavior, patterns, and trends.
- Provide the ability to overlay additional data in graphical format, including weather, price, and bill cost data.
- Utilize a customer analytics engine that leverages AMI usage data to provide the customer with insights and energy savings tips as well as personalized action plan to conserve and save.
- Provide the ability for the customers to understand what is driving their usage patterns to determine how their energy is being used, and what appliances are using the most electricity.
- Provide tools that will demonstrate the impact that an adjustment made in one or more areas will have on their usage and costs.

- Provide customers with proactive alerts associated with projected billing, home energy use, and customized thresholds set by customers (energy use or projected costs).

- Provide the ability for customers to schedule the delivery of energy usage reports on an ongoing basis.

Portal functionality will be tailored to specific customer segments, such as residential, small business, and large commercial, and optimized for viewing on all devices (e.g., mobile phones, tablets). The portal will utilize advanced web technologies and will ensure that customers can easily find and access information in a simple, intuitive manner. Customer Call Center employees will have access to the AMI meter data portal, which will allow them to better serve customers by allowing them to see what the customer is seeing regarding usage and other data points.

Q. Please describe the Customer Engagement Plan?

A. The fourth investment bundle also includes the Company's Customer Engagement Plan associated with the AMI Plan. The Customer Engagement Plan, which is included as Exhibit ES-AMI-2, Appendix C, identifies proactive customer outreach across multiple channels and at key stages during and after the AMI meter deployment. The Company must ensure customers experience a smooth and informed transition to AMI and are aware of how to capture the direct benefits and opportunities AMI presents for them. This outreach and education will include specific focus on the low- and moderate-income customer segment.

Q. Has the Company developed a budget for deployment of the Plan?

A. Yes. As shown in Exhibit ES-AMI-2, Appendix A,2 the total AMI build out costs from 2023 through 2028 is estimated to cost $620 million. The first investment bundle, which includes the AMI meters and communications systems, is currently estimated to cost $273 million. The second investment bundle, which includes the MDMS and CIS, is currently estimated to cost $172 million. The third investment bundle, which includes the engineering and data analytics components of the AMI system, as well as the cybersecurity investments, is currently estimated to cost $133 million. Lastly, the fourth investment bundle, which includes the customer portal, is currently estimated to cost $42 million.

Q. Will these cost estimates be further refined?

A. Yes. As discussed in further detail below, the Company is proposing a cost recovery mechanism associated with the Plan given the significance of the complex, interdependent investments the Company must make to ensure the AMI functionalities and benefits are achieved. The implementation of the comprehensive AMI Plan is a business decision that must be undertaken to support operations, customers and critical Commonwealth energy and environmental policies. Following Department approval of the types of investments included in each investment bundle described above, the Company will further refine its budget

2 The Company has also included a benefit cost analysis in Exhibit ES-AMI-4.

estimates and present those pre-construction quality estimates to the Department for review and approval prior to commencing cost recovery under the proposed cost recovery mechanism outlined below. All spending under the AMI Plan investment bundles will be subject to a further prudence review.

Q. Does the Plan contain an AMI deployment schedule?

A. Yes. Project schedule is a key component of effective implementation. As provided in Exhibit ES-AMI-2, Appendix A, the Company has developed a preliminary schedule designed to minimize costs associated with retirement of existing aging meters and systems and accelerate benefits delivered to customers. As provided in Exhibit ES-AMI-2, Appendix A, the Company's current estimated implementation schedule outlines the timeline for a five-year program to deploy a comprehensive AMI system to its 1.4 million residential and small commercial electric customers. Specifically, the Company is currently proposing to commence the AMI Plan in 2023 and complete the implementation by 2028.

The schedule is driven by several factors. First, the start of the five-year period is timed to reflect the optimal timing for replacement of existing meter infrastructure, supporting replacement of equipment as close as reasonably possible to its expected 20-year useful life. Second, the schedule reflects the necessary dependencies and required predecessor activities. For example, in advance of initiating meter replacements at customer premises, enabling investments in communications

infrastructure, the HES and MDMS must be completed. Further, programs for project management, change management, customer education and cybersecurity must be well established in advance of systems or meter deployment. Third, to the extent possible, the schedule is designed to enable benefit realization as soon as possible in the deployment period. For example, integration of AMI data into the Company's existing OMS will begin as soon as possible following the completion of the necessary investments in the MDMS. The Company will refine and increase the detail of this schedule over time in advance of project initiation.

Q. Do the various AMI investment bundles discussed above need to be implemented or sequenced in a certain order?

A. Absolutely. The total AMI investment is a very complex system comprised of various interdependent systems that are dependent on each other to provide the functionalities, and the benefits of those functionalities, to customers. These various systems must be implemented on a coordinated, sequenced timeline. If the Company were to deploy these investments without this timeline, the overall AMI investment plan would not function correctly, leaving both functionalities and value on the table.

Under the sequenced timeline shown in Exhibit ES-AMI-2, Appendix A, the Company must first implement the MDMS, which is a two-year process. The Company cannot start deploying AMI meters until it has a place to store the data that will be collected from those meters. Once the MDMS is complete, tested, and

operational, the Company will be able to build the interface with the OMS so that the Company will be able to utilize the meter data to determine whether a customer is without power during a storm or other emergency event. In parallel, the Company will begin building out the communications network. The Company cannot deploy the AMI meters until there is a system in place for the meters to communicate data back to the Company. Following the implementation of the MDMS and the communications network, the Company will then be able to commence deploying meters.

The CIS, which is a highly complex system, will take the longest to design and deploy. During the design and deployment of the new CIS, the Company will be able to use the MDMS to pass the AMI meter data to the current CIS for both EMA and WMA.

Lastly, once the Company has completed the design, testing and deployment of these foundation systems within the sequence set out in in the schedule contained in Exhibit ES-AMI-2, Appendix A, it will be able to begin designing, constructing, and testing the customer portal.

Q. Given the complexities associated with AMI deployment, as well as the significant timeline associated with that deployment, is the Company proposing to report on its progress over the term of the AMI Plan?

A. Implementation of the AMI Plan is a large, multi-disciplinary and complex undertaking that will extend over several years with benefits and outcomes accruing

over the entire life cycle of the AMI system assets. A project of this magnitude requires an organized and comprehensive focus on project and risk management. As described above, the Plan is designed to maximize outcomes of AMI in terms of customer engagement, support for clean energy technologies, grid planning and optimization and operational efficiency.

Providing transparency to the Department and other external stakeholders on progress relative to the steps outlined in the Plan will ensure that the Company is delivering on its commitment to execute deployment of this critical technology in the most secure, reliable, resilient, flexible, customer-focused and cost-effective manner possible.

As Eversource progresses into the final stages of planning, including completion of its RFP process to select vendor partners for hardware, software and services, the Company expects to provide the Department and other stakeholders with more detailed implementation plans with respect to scope, schedule and budget. Once the deployment period has commenced, it will be important for the Company to provide regular status updates relative to implementation metrics, including narrative descriptions of outcomes achieved, challenges, lessons learned and next steps. These implementation reports should reflect progress relative to expectations on the final AMI project scope, schedule, and budget. In addition to reporting on equipment and software deployment progress, the Company expects to provide

updates on its customer engagement and outreach activities.

In finalizing the content of these updates, the Company will work with the Department and other stakeholders to identify metrics and other implementation updates that are objective, based on observable data and reflect activities and outcomes that are under the direct control of the Company. To the extent possible, the Company will work with the other Massachusetts EDCs to ensure consistency in tracking and reporting cadence and content.

Q. Does the Company's AMI deployment include a cost recovery proposal?

A. Yes. The investments that will be undertaken as part of the AMI Plan represent a significant, complex, and interdependent initiative, which is larger in scale and scope and more intricate than the typical projects undertaken by the Company. There is no comparison between the scale and scope of the Company's routine operational and Information System ("IS") projects and the scale and scope of the AMI Plan in relation to the significance and complexity of the investments and the associated cost associated with AMI deployment, including the back-office systems necessary to support the meter deployment.

The Department's ratemaking framework does not readily incorporate recovery of substantial, upcoming costs. If the Company is forced to wait until the AMI Plan is completed to seek cost recovery through a base rate proceeding filed after the AMI Plan completion, the Company could be prevented from recovering a portion

of the total project costs due to the timing of rate cases and the prolonged suspension period associated with those cases. Given the prolonged development and implementation schedule and the magnitude of the costs, the recovery of the costs associated with the investment bundles described above through a cost recovery mechanism outside of base rates will provide a more stable rate path for customers and will enable the Company to offset its share of project costs during the implementation of the AMI Plan.

A ratemaking mechanism that operates outside of base rates is consistent with Department practice where the costs incurred are necessary and appropriate to accomplish a specific purpose, i.e., the full deployment of AMI consistent with the Department's directives in D.P.U. 20-69-A, that will provide benefits to customers, such as those described earlier in our testimony and in the AMI Plan, while offsetting other potential harm to customers, i.e., continuing to rely of technology, specifically AMR meters, that are verging on obsolescence when compared with the need to make progress towards the achievement of the Department's grid modernization goals, as well as other critical Commonwealth energy and environmental policies.

Q. Please describe the Company's cost recovery proposal.

A. The Company, consistent with the Department's directives in D.P.U. 20-69-A and in conjunction with National Grid, has developed a model tariff for the proposed

ratemaking mechanism. The model tariff, which has been provided as Exhibit ES-AMI-5, creates an annual reconciling mechanism where the Company is eligible to recover an annual AMI revenue requirement, which is defined as the revenue requirement associated with the Company's AMI-related plant-in-service for each AMI Investment Year prior to the Recovery Year, plus Recoverable operations and maintenance ("O&M") Expense.

Per the proposed model tariff, the AMI Revenue Requirement will be calculated to recover: (1) the monthly revenue requirement for eligible AMI investments recorded as in-service in the AMI Investment Year immediately prior to the Recovery Year; (2) the average annual revenue requirement for the calendar year ending December 31 of the AMI Investment Year two years prior to the Recovery Year, for cumulative Eligible Investments placed into service in the AMI Investment Years two years prior to the Recovery Year; (3) the annual revenue requirement for the Recovery Year on Eligible Investments recorded as in-service in the AMI Investment Year immediately prior to the Recovery Year; and (4) Recoverable O&M Expense.

Eligible AMI investments are defined as the cumulative capitalized costs directly attributable to implementation of AMI recorded as in-service, including net salvage, and are used and useful at the end of the AMI Investment Year that is prior to the Recovery Year. Recoverable O&M expense is defined as the incremental

O&M expense that is incurred by the Company as a result of implementing AMI (either incurred directly by the Company or charged to the Company by ESC), including the amortization of capitalized information systems costs billed to the Company by its affiliate and recorded by the Company as expense, the cost of which is not being recovered through base distribution rates or another cost recovery mechanism. Recoverable O&M expense is the actual monthly AMI-related O&M expenses incurred in the AMI Investment Year prior to the Recovery Year. Recoverable O&M Expense will exclude pension and post-retirement benefits other than pension costs recovered through other reconciling mechanisms.

Under the model tariff, and similar to other reconciling mechanisms, the Company will submit to the Department an annual AMI cost recovery filing that will include, but not be limited to:

(1) Project documentation of all eligible AMI investment recorded as in-service by the Company [or its affiliate] during the Prior AMI Investment Year;

(2) Documentation supporting non-recurring O&M expense as part of Recoverable O&M Expense;

(3) The AMI Reconciliation; and

(4) Bill impacts.

Q. Is the Company proposing that the Department approve the model tariff, as well as the estimated AMI budgets included in the AMI Plan?

A. No. The Company is not asking that the Department approve its current AMI budgets for recovery through the provisions included in the model tariff. The

Company, along with National Grid, is asking the Department to approve the reconciling mechanism framework set out in the model tariff. The Company is also seeking the Department's authorization to move ahead with the AMI implementation plan, with cost recovery allowed through the mechanism described in the model tariff, subject to a subsequent filing to obtain the Department's approval of a company-specific tariff and pre-implementation project budgets, subject to a later prudence review once the system is implemented.

In a separate, future proceeding (likely the upcoming base distribution rate case), the Company will seek Department approval of an NSTAR Electric-specific tariff containing the approved provisions of the model tariff. In that future proceeding or a subsequent proceeding, the Company will file refined AMI budget estimates and present those pre-construction quality estimates to the Department. Once the Company has filed refined AMI budget estimates, it will seek Department approval to commence recovery of costs consistent with the NSTAR Electric-specific AMI cost recovery tariff. All spending under the AMI Plan investment bundles will be subject to a comprehensive prudence review following implementation.

Q. How has the Company addressed the issue of costs related to current AMR meter replacement that are included in base rates?

A. Consistent with the Department's order in D.P.U. 20-69-A, the Company, in preparing for its upcoming base distribution rate case, is conducting a review of the meter-related costs that will be included in the cost of service for new base

distribution rates effective on January 1, 2023. The effort will distinguish the population of AMR meters to determine the remaining life for depreciation purposes. As stated above, over the next six years, approximately 740,000 meters will be over 20 years old. It is critical that the depreciation of the remaining AMR assets appropriately align with the Company's plans to deploy AMI over the near-term to maximize customer benefits. This analysis will be provided for the Department's review in the up-coming base distribution rate case.

Q. Has the Company provided a model AMI opt-out tariff for the Department's review?

A. Yes. Consistent with the Department's requirement in D.P.U. 20-69-A at page 34-35, the Company is providing a model AMI opt-out tariff as Exhibit ES-AMI-6. Specifically, the Department directed the EDCs to confer and develop a model AMI opt-out tariff. D.P.U. 20-69-A, at 36, nt. 15. National Grid currently has an approved opt-out tariff in place, so the Company has modeled its AMI opt-out tariff on that approved tariff in order to comply with the Department's directive.

Q. Does this conclude your testimony?

A. Yes, it does.

AMI Implementation Plan

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II. Introduction

Overview

NSTAR Electric Company d/b/a Eversource Energy ("Eversource" or the "Company") endeavors to be a catalyst for clean energy initiatives and actively seeks out opportunities to engage customers in capturing the benefits of an electric grid that enables equitable access to energy efficiency, clean transportation, and renewable energy resources, among other initiatives. At the same time, the Company recognizes that continuous improvements in its operational performance will deliver results for customers in areas such as storm restoration, customer service and grid management. Currently, the Company is in a unique position to address the need to make necessary and timely

investments in its metering equipment and associated systems by executing a comprehensive and coordinated program designed to maximize value to customers in these and other areas.

The Company is currently using drive-by automated meter reading ("AMR") meters with an average useful life of 20 years. The majority of existing AMR meters were deployed in 2000 through 2006. As a result, over the next six years, approximately 740,000 meters will be over 20 years old. The Company's existing AMR meters are rapidly nearing the end of their useful life. Were the Company to reinvest in AMR meters, it would significantly detract from the Company's ability to continue to make substantial progress in modernizing the distribution system and enabling a cleaner energy future. Rather than invest in a metering system, such as AMR, that will act as a hindrance, rather than an asset, to achieving critical Commonwealth energy and environmental goals, the Company recognizes that advanced meter infrastructure ("AMI") is the only replacement solution that can ensure that the Company is able to manage its distribution system effectively and safely for its customers.

For over 13 years, the electric power industry has been transitioning its customer meter inventory from manual and drive-by meter reading technology to AMI systems that collect detailed usage data in granular increments via a wireless communications system, providing the foundation for transformational customer and utility operating insights.

As a result of this transition, in 2019, approximately 60 percent of electric meters in the United States utilized AMI technology and that proportion continues to increase as major utilities execute meter replacement programs. Over this period, utilities have demonstrated the value of this technology and have developed important lessons learned related to capturing benefits for customers. Examples of industry experience in implementing AMI are discussed in the March

2019 report, "Voices of Experience: Leveraging AMI Networks and Data," sponsored by the U.S. Department of Energy. The report provides insight into value provided in the areas of operations, customer experience, data analytics and offers advice on implementation strategies.

Whereas early AMI deployments focused primarily on basic functions such as remote meter reading and interval usage data collection, utilities are increasingly taking advantage of systems integration, data analytics and grid-edge computation to provide incremental benefits without adding significantly to the overall project cost.

A modern AMI deployment reflects the imperative to consider AMI as more than meters and communications infrastructure but rather as a complete system, inclusive of systems and integrations that together will optimize the full utilization of this technology. As depicted in Exhibit ES-AMI-2, Appendix A, a comprehensive approach to AMI deployment for Eversource customers is inclusive of a meter data management system ("MDMS") and a customer information ("CIS") as well as customer engagement systems and integration to the Company's existing outage management system ("OMS") and platforms to enable engineering analytics.

A third-party review of industry trends and technology maturity commissioned by the Company supports the conclusion that this type of comprehensive deployment of AMI is the necessary course of action to transition away from existing aging meter infrastructure and associated systems. See Exhibit ES-AMI-3.

This Eversource Massachusetts AMI Implementation Plan ("the Plan") provides a detailed description of the optimal path forward towards a cost-effective deployment of AMI for all 1.4 million residential and small commercial electric customers. The Plan includes sections outlining the steps the Company will follow to ensure execution is well-planned, efficient, cost effective and

incorporates principles of risk and change management. Project schedule will be another key component of effective implementation. As provided in Exhibit ES-AMI-2, Appendix A the Company has developed a preliminary schedule designed to minimize costs associated with retirement of existing aging meters and systems and accelerate benefits delivered to customers. The Plan includes the multiple components required to deliver the most effective outcomes for customers for the associated cost. As detailed in Exhibit ES-AMI-4, supported by a third party with experience in AMI analysis and implementation, the Company conducted a thorough effort to catalog all sources of value that AMI is capable of delivering as enabled by the Company's planned investments. This assessment will ensure the AMI implementation is focused on both value and outcomes in the near and long term.

Outcome Focused Implementation

The Plan outlines steps required to deliver on the potential of AMI to provide value-added outcomes for customers. Many of the benefits enabled by AMI accrue directly to customers. Access to usage information, insights, alerts, and availability of optional time-varying rates, for instance, will provide customers with new opportunities to manage energy consumption and lower bills. Many of the benefits unlocked by AMI will accrue indirectly to customers. Expenses such as theft and other losses are socialized to all customers can be reduced through initiatives made possible with an AMI deployment. Some benefits, such as reduced truck rolls, are focused on improving the Company's operational efficiency when providing service to customers.

For customers, AMI will enable increased access to more granular usage information, improving the customer's understanding of energy savings opportunities. This information has the potential to be powerful for the customer when combined with new rate designs and participation in energy

efficiency and demand-response programs. AMI may also improve the efficacy of optional customer information tools such as load disaggregation applications. Customers will benefit from more timely updates from the Company, such as mid-cycle high bill alerts and customer-directed bill alerts, which are service offerings that are proven to be of value to customers. In addition, call center representatives would have access to more granular data putting them in a better position to help customers understand how changes in their usage impact changes in bill amounts and recommend participation in energy efficiency programs. Another customer benefit of AMI technology is improved frequency and precision of communications during outages and storm restoration, as well as reduced time for meter transactions, including service turn-on's, which can be conducted quickly and efficiently.

For real-time grid operators, AMI will provide tools to improve the customer experience by remotely examining meters to determine if power is flowing, rather than waiting for the customer to call the Company, thereby reducing response time and improving the accuracy of estimated restoration times. Grid operators will be able to remotely view voltage and power quality data at the customer meter, reducing the frequency of visits by troubleshooters or engineers to customer locations and supporting faster resolution of customer issues. Ultimately, in combination with real-time load flow tools such as a distribution management system, grid operators will benefit from improved model accuracy and precision which will improve situational awareness for both day-ahead planning and forecasting and real-time operations, including advanced applications that improve system efficiency and reduce line losses, providing customer and societal benefits. Future applications may also improve the grid operators' response to serious safety hazards associated with downed wires and unregistered customer generation.

AMI Implementation Plan

For distribution planning engineers, AMI data will provide access to granular information which will be utilized in load-flow planning models used to prioritize future system upgrade projects. Future applications may also use advanced analytics to identify areas prone to outages before the outage occurs, improving reliability for customers. Planning and communications engineers can leverage the AMI communications network to collect data from other field devices, such as line sensors, providing a reliable method to further improve visibility of the grid.

The Plan is also designed to deliver outcomes in support of Massachusetts policy objectives that have been enacted in recent years to encourage; grid modernization; reductions in greenhouse gas emissions; increases renewable resources; decreases in peak energy usage; provide customers energy efficiency options; and increases in renewable resources.

In many ways, AMI implementation will enable a cost-effective, economy-wide transition to a decarbonized future. As proposed, the Company's AMI deployment plan provides multiple opportunities to support cost-effective reductions in carbon emissions. In its AMI analysis, Eversource has estimated the impact of AMI on the effectiveness of programs to improve its existing and future Volt VAR optimization ("VVO") programs that manage voltage and improve system efficiency. Aided by AMI technology, VVO programs can be augmented to provide incremental reductions in energy usage, peak demand, and line losses. These reductions have both economic and environmental benefit. Further, the wireless communications network included in the Company's AMI proposal will allow for remote operations that reduce carbon emissions associated with truck rolls.

As a major clean energy infrastructure initiative, delivering new technology and capabilities to over one million customers, the proposed AMI deployment will have a positive impact on the

Massachusetts economy. The capital investments resulting from the Eversource AMI plan are expected to result in significant direct and indirect job creation over a 20-year period. In addition to benefits associated directly with the Company's plan, Eversource expects the availability of the AMI platform will create numerous business opportunities across multiple industries. For example, customer-level peak load information and rate design structures that are enabled by AMI have the potential to support adoption of both electric vehicles and behind-the-meter energy storage technologies in Massachusetts at a higher rate than would otherwise occur.

Thoughtfully deployed, AMI implementation has the potential to advance the ongoing energy affordability dialogue in the State, particularly in underserved communities. Full deployment of AMI to all Massachusetts customers will provide several opportunities to leverage access to information to that will help customers to better manage their energy usage. By placing emphasis on capturing the value of data analytics to target customers most likely to benefit from energy savings programs, Eversource will have additional tools to encourage active participation in its energy efficiency programs, including those geared towards low-income customers. For instance, low-income customers are currently eligible for a wi-fi thermostat at no cost. In the future, combined with an AMI enabled program to earn a rebate for peak demand reduction on an opt-in basis, these customers will have additional savings opportunities. Further, features such as high-bill alerts will give customers easy access to actionable information to manage energy expenditures, including customers on a fixed income. At this time, the Company anticipates that any time-varying rate will be offered on an opt-in basis. Data analytics will provide customers with information to determine whether a rate design option is likely to result in lower bills. The Company also expects to evaluate peak-time rebate programs that rewards customers for reduced usage during peak events as a potential future offering to customers.

AMI Implementation Plan

Implementation Schedule

As provided in Exhibit ES-AMI-2, Appendix A, the Company's current estimated implementation schedule outlines the timeline for a five-year program to deploy a comprehensive AMI system to 1.4 million residential and small commercial electric customers. The schedule is driven by several factors. First, the start of the five-year period is timed to reflect the optimal timing for replacement of existing meter infrastructure, supporting replacement of equipment as close as reasonably possible to its expected 20-year useful life. Below, the Company discusses the proposed meter deployment strategy. Second, the schedule reflects the necessary dependencies and required predecessor activities. For example, in advance of initiating meter replacements at customer premises, enabling investments in communications infrastructure, the head-end system ("HES") and MDMS must be completed. Further, programs for project management, change management, customer education and cybersecurity must be well established in advance of systems or meter deployment. Third, to the extent possible, the schedule is designed to enable benefit realization as soon as possible in the deployment period. For example, integration of AMI data into the Company's existing OMS will begin as soon as possible following the completion of the necessary investments in the MDMS. The Company will refine and increase the detail of this schedule over time in advance of project initiation.

Implementation Budget

As depicted in Exhibit ES-AMI-2, Appendix A, the Company has developed a preliminary budget estimate for the five-year AMI project implementation period. Strategic-level cost estimates have been developed for each component described in the Plan based on multiple sources, including a request for information issued to meter, communications and installation vendors; consultant

assessments; and internal subject matter expert analysis. The budget items include capital costs, such as meters and communications infrastructure, information technology costs and expense costs that will be accrued over the implementation plan period.

In its planning process, the Company considered several opportunities to lower implementation costs by maximizing the value of existing assets. For example, existing communications back-haul infrastructure will be used as a path to transmit data from pole-top collectors into the Company's network. The Company will also leverage certain existing IT systems where applicable, including a data analytics platform and the OMS, to perform additional analysis and increase functionality.

The value of the Company's existing and future energy efficiency and demand response programs will also be increased by AMI technology. With improved targeting of customers for these offerings, Eversource expects to increase program participation and effectiveness. Improved measurement and verification, enabled by AMI, will also provide benefits to these programs.

Additional details on the Company's cost estimates by investment category for the project implementation and ongoing operations and maintenance are shown in Exhibit ES-AMI-4. The Company will refine and increase the detail of this budget over time in advance of project initiation.

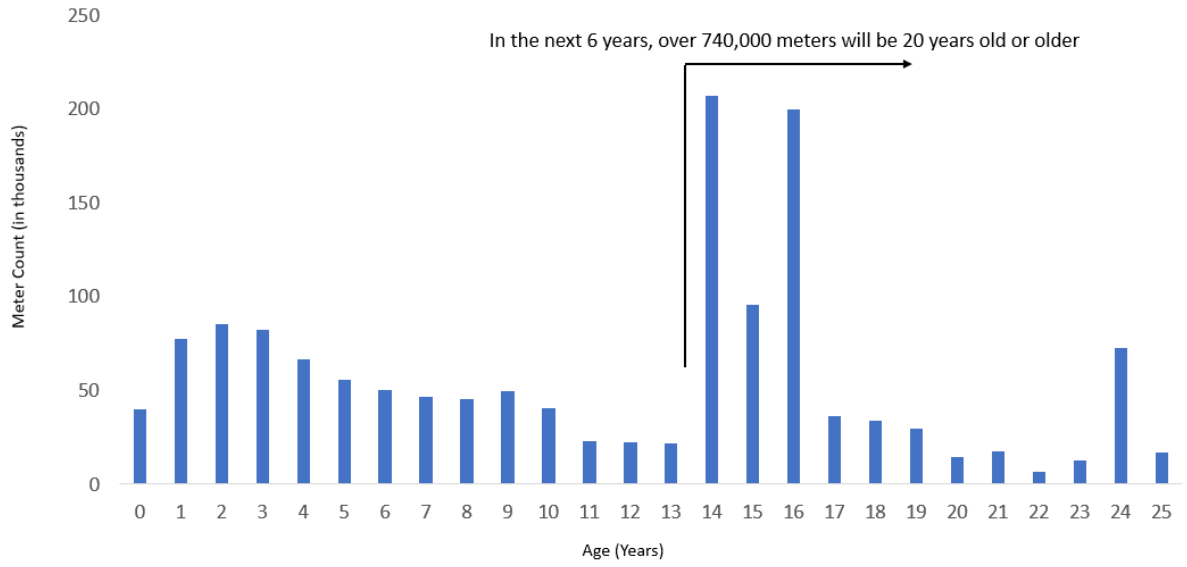
Meter Deployment Strategy

Current metering technology, in service for most customers today, measures and transmits total usage for a single month as of the point in time the meter is read each month. This one value is collected via an AMR drive-by system and stored in the Company's back-office systems for billing

purposes. Although AMR meters are efficient and effective in collecting accurate usage data for billing a single volumetric rate, these meters provide no insight into usage throughout the day in granular intervals and thus no opportunity to provide information or incentives for customers to reduce peak demand.

Eversource transitioned from manual meter reading to this AMR drive-by system in the early 2000's installing over 525,000 meters between 2000 and 2006. Figure 1, below, provides a distribution of the current age profile of AMR meters in Massachusetts. These meters are approaching the end of their useful life. In total, over 740,000 meters will be 20 years or older in six years. As described above, continuing with the currently deployed AMR drive-by technology, and replacing meters with like-for-like technology as the AMR meters reach the end of their useful life is no longer a viable option.

Figure 1: MA Meter Age Profile

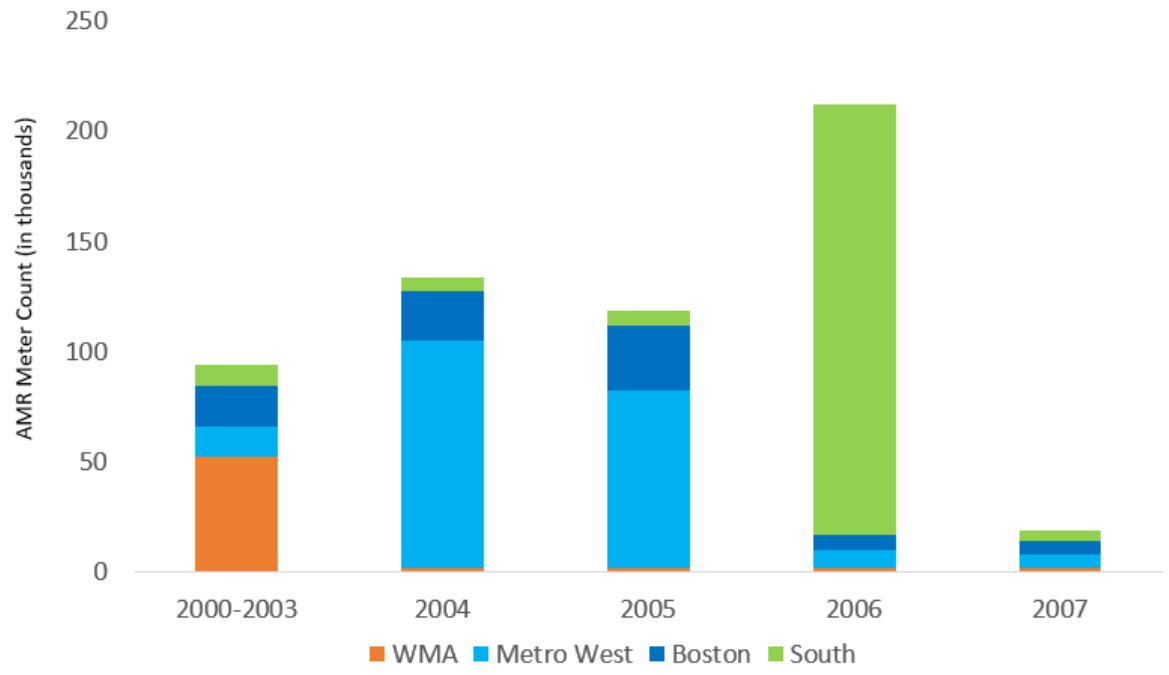


AMI Implementation Plan

The Company's implementation schedule and budget reflect two opportunities to increase the value of AMI deployment to customers by optimizing its meter deployment plan.

First, the Company will replace meters based on a geographic deployment schedule that re-traces the 2000 to 2006 AMR deployments starting in western Massachusetts, followed by Metro West, Boston, and South regions. Figure 2, below, provides details on the Company's past AMR deployments by region.

Figure 2: AMR Meter Deployments by Region 2000 - 2007



Second, the Company's current planning analysis includes an assumption that it will be able to utilize over 260,000 "bridge" meters deployed in recent years. Bridge meters are currently configured to function as drive-by AMR meters, but also are enabled with local area remote disconnect functionality and have the capability to convert to AMI mode if other required

functionality is enabled (e.g., compatible mesh network, AMI HES and MDMS). Recent advances in meter technology are improving the cost-effectiveness of AMI relative to prior years by providing enhanced value-added capabilities at a similar cost.

In the following sections, the Company provides information regarding the approach it will take in implementation of the AMI project post approval by the Department. This plan represents the best information available at this time and will be adjusted and revised as more information and details are known.

III. Program Management

The program and project management processes that the Company utilizes are scalable and will be utilized to match the size, complexity, regulatory obligations, stakeholder exposure, and risks of the AMI program as well as the individual component projects that comprise the larger program. Implementation of the AMI program will proceed through the following four phases: Initiation; Planning; Executing and Controlling; and Closeout. Certain deliverables are related to each phase. The Company has a breadth of experience managing programs and projects of various sizes and complexities and will draw upon Company and industry best practices for the AMI implementation. The following identifies the key aspects of the four phases of program and project management practices the Company plans to employ.

Project Initiation

The first step is to obtain internal funding authorization consistent with the Company's Project Authorization Policy and procedures which the Company follows in this regard. Initial funding will be required to develop a process for which the larger AMI program will be layered into the

AMI Implementation Plan

Company's existing business practices and leverage the existing capabilities, processes, procedures, departments, and personnel within the Company.

Once program funding is approved, a program management approach based on industry and Company best practices will be established. The organizational design including a Program Management Office ("PMO"), executive steering, and operational management structure will be established. The Company will identify resource needs and acquire PMO resources as appropriate.

As the AMI program is developed, the Company will utilize internal guidelines to identify and initiate individual projects that will constitute the larger AMI portfolio. The individual projects will be unique in nature, in the sense that their duration, team resource needs, complexity and budgets will vary. The AMI PMO will coordinate and oversee the comprehensive AMI program and individual projects so that they are efficiently and effectively implemented.

Planning Phase

The planning phase builds on the preliminary schedule created for project approvals and further defines who and how work will be performed to determine the project requirements, how the project objectives will be met, identification of project resources and outreach to key stakeholders. Throughout the planning phase, the Company draw upon existing frameworks, templates, and communication channels used for other projects and programs within the Company.

A program plan will be created to lay out the project strategy and articulate the project scope, risk, constraints, assumptions, control mechanisms, and criteria for success. The project schedule will be the basis for progress reporting, and will adequately define support activities, scheduled critical resource needs with enough detail to avoid interference, conflicts and delays. Risk management

is performed to identify and plan for items that may impact the project and will also include the mitigation plan for existing and potential project risks.

An internal communication plan will be developed to determine how project issues, status, and other relevant information will be communicated among the PMO, project managers, other team members, and to senior management. Appropriate outreach and communications with project stakeholders will be coordinated closely with the project activities.

Executing and Controlling

This phase implements and manages activities within a program or project and ensures all progress on the project is closely monitored. In many cases, the largest portion of time is allocated to the executing and controlling phase. Reporting requirements and controls will be tracked, and performance will be closely monitored on a programmatic and individual project level. It will include identifying variances from the program or project scope, schedule, and budget. The PMO will be responsible for executing and controlling at the program level and dedicated project managers will execute and control individual AMI program projects.

Any scope, schedule, and budget deviations will be addressed through change management and/or recovery plans. Any deviations from the original project plan will be managed by the project or program manager and in accordance with or project authorization policies. If there are any large deviations from the original plan that require supplemental funding, the Project Authorization Policy requirements will be followed.

The project tracking plan will include lessons learned to assess, learn, and share project experiences to benefit the execution of the project. Relevant project tracking metrics will be

leveraged to improve project continuity and drive well informed decisions. Project documentation and decisions will be entered into the appropriate records storage system and provide a written history of the project.

Project Closeout

Project closeout occurs on two paths, financial closeout and administrative closeout. The financial closeout work involves closing the project work orders, which is an accounting process that completes the Company's financial records. The normal life-cycle of a capital project results in the need for the timely declaration of the in-service date.

The classification of work orders as "in-service" results in the classification of costs to rate base, begins depreciation and inclusion in the basis used for property taxes. A target timeframe for a work order to be placed in a completed status is within 90 days of the work order going into service.

The purpose of the project administration closeout is to officially close the project declaring all project deliverables and organizational ownership hand-offs are complete. This work involves verifying that project documentation is complete and properly archived. Administrative activities also include project records, equipment turnover, and project lessons learned. Some key areas include, reconciling the schedule and developing variance reporting. Variance reporting reflects and explains deltas between baseline and actuals.

IV. Communications Network & Installation

Overview of Communications Network

The communications network is the backbone that enables remote two-way communication between meters and supporting back-office applications. The communications network design

will incorporate several technologies working together to ensure secure, reliable, resilient, and timely data transmission. The network will be designed to meet Company-specified requirements in areas including the following:

- **Security.** The network must be protected with physical and cybersecurity measures that ensure data privacy and minimize the risk of unintended system access.

- **Resiliency.** The network design must include sufficient redundancy and backup to protect against disruption due to weather or other events on the system.

- **Reliability.** Data transmission must be reliable and consistent to support the Company's requirements for billing and usage presentment to customers.

- **Cost-Effectiveness.** To the extent possible, network design should incorporate existing infrastructure such as fiber and microwave used for data backhaul.

- **Optionality.** The network should be designed to enable flexibility to incorporate data transmission for non-mission critical devices such as line sensors and be scalable to support data transmission from gas and water meters.

In recent years, the Company has undertaken several initiatives to understand the costs and benefits of communications network technologies. In 2021, the Company refreshed its strategic assessment of available telecommunication options for various field area network use cases including AMI, distribution automation, mobile voice, and field device data. Technologies assessed included private radio, private cellular, public carrier cellular, private mesh, and point-to-multi-point wireless networks. In addition, the Company has conducted two requests for information ("RFI") since 2020, focused specifically on the meter and communications technology and meter

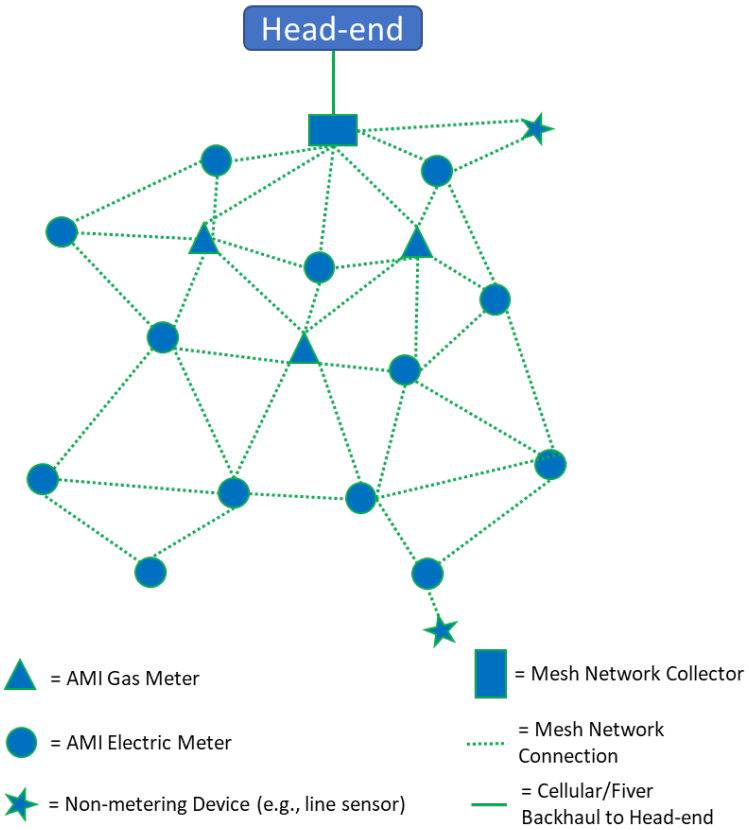
installation. As described in Exhibit ES-AMI-4, based on these and other efforts, the Company expects that a hybrid approach, utilizing a private wireless 'mesh' network coupled with public carrier cellular networks, is likely to be the most effective technology for its electric AMI telecommunications network needs.

Following a decision to proceed with AMI, the Company will conduct a formal request for proposal to select the best technology solution to meet communications network requirements. The infrastructure for a wireless mesh network consists of meters with embedded communications modules supporting mesh and cellular radios. Equipment includes the wireless mesh collectors that collect meter data and transmit them to the back-office via fiber or wireless carrier and repeaters for extending the mesh network for hard-to-reach meters. In addition to this field equipment, the mesh network must include a head-end system necessary to securely decrypt meter data and make it ready for consumption by other methods, including the meter data management system.

As shown in Figure 3, below, in a mesh network architecture, each meter acts as a repeater and collector at the grid edge, enabling the 'mesh' that provides network resiliency through multiple communication paths. Previous generation mesh networks were characterized by limited capacity and were designed only for meter data and disconnect/reconnect signal transmission. Current generation wireless mesh networks can support transmitting all types of meter data (e.g., voltage, current, temperature) and support non-metering devices like line sensors.

AMI Implementation Plan

Figure 3: Illustrative AMI Mesh Network Architecture



The latest generation AMI mesh networks enable powerful smart meters with enhanced processing and memory capabilities to run applications and securely share data among peer meters. These enhanced capabilities allow the meters to interpret the scope of a network outage, rapidly sample and interrogate voltage quality, and provide insight into the general health of the electric network. As described in the Meter Equipment and Installation section, this new AMI architecture has enabled multiple new use cases and enhanced existing ones.

As a part of its AMI implementation, the Company will collaborate with peer utilities in the Commonwealth to explore a possible shared AMI network infrastructure agreement. The Company and several utilities in the Northeast region have an existing shared telecommunications network ("STN") agreement for sharing fiber and microwave radio wide-area network

infrastructure. The Company and its peer utilities could potentially expand the existing STN to include the backhauling of AMI data, decreasing the cost of AMI data backhaul and decreasing the dependence on public carrier cellular networks for AMI data backhaul.

Communications Implementation Plan – Procurement of Products & Services

As described above, the Company will develop an extensive set of requirements for an AMI communications network that will meet business needs for a secure, resilient, reliable, flexible solution considering all opportunities to lower the total cost of ownership over the asset life cycle. The inclusion of clear and accurate requirements in the request for proposal ("RFP") is critical for evaluating, testing, and selecting the vendor for each component of the AMI system. The development of the RFP requirements will also include the evaluation and testing criteria, which the Company will use for final vendor selection. The Company expects to issue a single comprehensive RFP for AMI meter equipment, meter installation, communications network, head-end system, and meter data management system. This strategy will provide a diversity of responses in recognition of the potential synergies of a single-vendor solution for complementary technologies while enabling specialized vendors to offer responses for a sub-set of requirements.

In procuring its AMI meter and communication solutions, the Company will follow its established competitive procurement process as it does with all purchases of services and equipment as required by Eversource policies. The Company will evaluate vendors for each of the components of the AMI system. Vendor evaluations will consist of their network solution's performance in different locations (e.g., urban environments, meters in basements). Proposed technologies will be tested on several criteria, including but not limited to their bandwidth, latency, and outage recovery capabilities. In addition, the vendor's proposed technology will be tested and evaluated

following the Company's procurement process to ensure there is no breach in non-disclosure agreements.

The Company will make its vendor selection based on performance against the testing and evaluation criteria and the overall cost of the solution. Once the Company makes a final vendor selection, it will begin contract negotiations. Contract language and statements of work will be crafted with clear requirements and accountability for specified milestones and deliverables over the course of the project implementation and warranty periods.

Communications Implementation Plan – Planning Activities

The Company will develop a cost-effective equipment deployment strategy for the telecommunications network that will utilize internal and outsourced labor resources. As described in Exhibit ES-AMI-4, the Company has conducted thorough interviews with several peer utilities that have deployed AMI to estimate the number of labor resources it will need to continue to support and maintain the AMI network in the state.

Dedicated labor resources will be required to install, test, and commission communications network equipment in the field. This work will include required upgrades and reconfiguration of communications backhaul equipment. Following the installation period, labor resources will be necessary to monitor the AMI network and associated repair and maintenance activities.

The Company will work with the selected vendor(s) on a cost-effective materials storage strategy. Materials for the communications network that will require storage vary depending on the communications technology that is ultimately selected, but it can include access points, collectors, relays, routers, and base stations. All the vendors that responded to the Company's RFI provided

estimated costs for materials storage solutions that they can provide. Currently, the Company does not have the required storage space for the large number of network equipment deployed in the three-year network deployment window, parallel to the meter deployments. Therefore, the Company will evaluate storage solutions through the RFP as part of the overall vendor evaluation process.

In the planning phase of implementation, the Company will finalize a detailed deployment schedule and budget for the entire AMI system, including the communications network, following completion of the RFP process. The Company expects to deploy the communications network and the accompanying head-end and MDMS approximately six months before the first AMI meter deployment. The exact deployment schedule for the communications network will depend in part on the selected vendor(s) equipment availability. The Program Management section of this report provides details on project management activities.

In the planning phase, the Company will also develop metrics for the deployment of the communications network. Examples of these metrics include: the number of routers deployed per day or week, geographical coverage percentages, and the number of meters experiencing communications issues. The Company will utilize these metrics to track the progress of the network equipment deployment, ensuring that the deployment of the network is within budget and on time. Adherence to these metrics will be part of the contract between the selected vendor and the Company.

The Company will also develop network operations metrics that will ensure the network is optimized and issues are resolved and mitigated quickly once the communications network is deployed. The Company will continuously track network disruptions, especially during inclement

weather events. Tracking these metrics will allow the Company to optimize the network further, identify potential vulnerabilities in the network, and mitigate these areas to increase resiliency and dependability. Example tracking metrics associated with the network include, but are not limited to, meter read rates; meter loss of communications; bandwidth of network routers and collectors; and latency statistics.

Communications Implementation Plan –Deployment, Operations, and Maintenance Activities

Planning, deployment, testing, and commissioning of communication equipment will take place over a three-year period. As described above, the deployment schedule will ensure that communications infrastructure will be in service in advance of meter deployment to eliminate the potential for any disruption in the collection, validation, and storage of meter data required for customer billing in the transition from AMR to AMI. Also, during the deployment phase, the Company will establish an AMI network operations center ("NOC"). This centralized team of AMI operators will be responsible for monitoring the AMI meters and communications equipment 24 hours a day, seven days a week, 365 days a year. This team will be closely coordinating with the technical support team in the field and initiating actions to resolve any issues. The Company will, through the RFP, procure the required software that enables the monitoring of the AMI network end-to-end, from the meter to the head-end system. The AMI NOC will perform remote troubleshooting and coordinate with the technical support team to initiate change orders, investigate network and meter connectivity issues, and support the Company during outage events.

V. Meter Equipment & Installation

Overview of Meter Equipment

AMI meters are the foundational investment required to enable all the associated use cases in the Company's AMI proposal. The first AMI meters were deployed in the United States in 2006, with a significant surge in deployment starting in 2009, as part of a $3.4 billion-dollar Smart Grid Investment Grant ("SGIG") program funded by the American Recovery and Reinvestment Act ("ARRA") through the federal government. The SGIG program concluded in 2015, with 70 AMI deployment projects totaling over 16.3 million AMI meters. Due to limitations in the hardware capabilities of the meters at that time, business cases for these projects focused primarily on providing benefits by reducing meter reading costs, enhanced outage detection, and shifting demand via time-varying rates. AMI deployments have continued to date, and currently, *over 60%* of homes in the United States have AMI meters. This proportion is growing with several major AMI deployments underway.

In the recent years, advances in the industry have enabled additional capabilities in AMI meters and the supporting communications infrastructure. For example, the new generation of AMI meters share data with other nearby devices and are also capable of processing and storing large amounts of data. The industry typically refers to these new capabilities as "distributed intelligence." In addition, more powerful processors and expanded memory are increasing the capabilities of each meter, enabling advanced on-meter applications with capabilities like connectivity model verification. Table 1 below provides a description of meter functionalities. Because these advanced capabilities can represent cybersecurity and data privacy risks, the Company will implement a robust, industry best-practice cybersecurity process to evaluate and

implement these technologies. The Cybersecurity section below, provides additional details on the Company's AMI cybersecurity and data privacy plan.

Table 1 – Meter Functionality

Functionality	Associated Benefit
Distributed Intelligence (Peer-to-Peer)	Optimizing power flow Proactive outage planning Early outage detection Energy theft and write-off reduction
Advanced On-Meter Applications (Load Disaggregation, Advanced Alerts)	Market participation/ rate design Customer targeting for initiatives
Phase Identification	System planning optimization
Voltage Monitoring	Optimizing power flow
Remote Service Switch (Re/Disconnect)	Energy theft and write-offs reduction Service order automation
Connectivity Model Verification	Optimizing power flow
Per-Element Current Measurement	Market participation/ rate design Customer targeting for initiatives
Micro-Arc Sensing	Proactive outage planning Early outage detection
Neutral Monitoring	Early outage detection
Meter Movement Sensing	Energy theft and write-offs reduction
Load-Side Voltage Sensing	Optimizing power flow
Reverse Power Flow Detection	System planning optimization
Cover Removal Detection	Energy theft and write-offs reduction

In 2016, the Company launched the Remote Disconnect Project to replace a portion of its hard-to-reach meters to increase operational savings and decrease customer write-offs and bad debt paid

for by all other customers. The Company worked with a partner vendor to develop and purchase AMR meters with the remote turn-on and turn-off capability through the existing meter reading system. The Company can switch these meters to AMI mode if a compatible wireless network is available, and because of this capability, these meters are referred to as "bridge" meters. Due to the success of the Remote Disconnect Project, the Company migrated to the bridge meter as its standard for meter replacements.

The newer generation of AMI meters currently available in the marketplace encompasses functionality that was not available in the early bridge meters deployed in the Company's service territory. For example, current AMI meters are capable of grid-edge computation, processing hundreds of millions of data points captured by each AMI meter and distilling that data into actionable insights for customers and the grid.

The Company is proposing to convert the approximately 1.1 million remaining AMR meters to next-generation AMI meters to maximize the benefits enabled by AMI. In addition, the Company plans to integrate the existing population of 263,000 bridge meters into the new generation wireless network that enables advanced AMI features like distributed intelligence.

Current state-of-the-art AMI meters can collect data, analyze it on-meter, decide what action to take, or signal to send to the utility back-office. Advancements in mesh network technology and 4G/5G LTE have supported the Internet of Things (IoT), enabling near real-time data sharing between devices through device-to-device communication. Providing only the data the utility needs or wants at the right time and without impacting the supporting network allows the utility to leverage actionable AMI data. Examples of use cases enabled by the advanced capabilities of the current AMI meter and wireless communications network include neutral monitoring, connectivity

model verification, and advanced load disaggregation. In addition, recent advances in meter technology are improving the cost-effectiveness of AMI relative to prior years by providing enhanced value-added capabilities at a similar cost.

Meter Implementation Plan – Procurement of Products & Services

The Company will develop an extensive set of requirements for AMI meters that will meet business needs for a secure, cost-effective, and future-proof solution considering all opportunities to lower the total cost of ownership over the asset life cycle. The inclusion of clear and accurate requirements as a part of a rigorous RFP process is critical for evaluating, testing, and selecting the vendor for each component of the AMI system. The development of the RFP requirements will also include the evaluation and testing criteria, which the Company will use for final vendor selection. As described below, the Company will follow its established competitive procurement process to test and evaluate the proposed AMI meter equipment solutions. Proposed meter equipment solutions will be assessed and tested on their functionalities, demonstrating the meter equipment's capability to realize the benefits enabled by the AMI system.

The Company will make its AMI meter equipment vendor selection based on performance against the testing and evaluation criteria and the overall cost of the solution. Once the Company makes a final vendor selection, it will begin contract negotiations. Contract language and statements of work will be crafted with clear requirements and accountability for specified milestones and deliverables over the course of the project implementation and warranty periods.

AMI Implementation Plan

Meter Implementation Plan – Planning Activities

The Company will develop a cost-effective equipment deployment strategy for the AMI meters that will utilize internal and outsourced labor resources as appropriate. The Company will require dedicated labor resources to install and test each AMI meter in the field. Following the installation period, labor resources will be required to repair and maintain AMI meters. In addition, as described below, the Company will work with the selected vendor(s) on a cost-effective materials storage strategy for the AMI meters. All the AMI meter equipment vendors that responded to the Company's RFI provided estimated costs for materials storage solutions that they can provide.

As described below, the Company will finalize a detailed deployment schedule and budget for the entire AMI system, including the AMI meters, following the completion of the RFP process. The Company expects to deploy the communications network and the accompanying head-end and MDMS approximately six months before the first AMI meter deployment. The Company will develop metrics for the deployment of the AMI meters. Examples of these metrics are the number of AMI meters deployed per day or week, geographical AMI meter deployment percentages, and tracking of post-installation AMI meter issues like failed reads. The Company will utilize these metrics to track the progress of the AMI meter deployment, ensuring that the deployment of the meters is as efficient and aligned with the deployment timeline. Adherence to these metrics will be part of the contract between the selected vendor and the Company.

The Company will also develop AMI meter operations metrics that will ensure post-deployment meter issues are quickly resolved. The Company will establish these metrics as part of its overall AMI operations plan, which includes communications network monitoring and optimization efforts. Once an AMI meter is installed, it becomes part of the communications network, so the

Company will develop metrics that will distinguish between the meter and network issues. For example, AMI meters are experiencing intermittent communications issues that is not being exhibited by nearby meters in the local area. These metrics will facilitate troubleshooting and monitoring efforts as the AMI network and the number of deployed AMI meters expand.

Meter Implementation Plan –Deployment, Operations and Maintenance Activities

As described below, the planning, testing, and deployment of AMI meters will be over three years. The deployment schedule will ensure that communications infrastructure and supporting back-office systems will be in service in advance of meter deployment to eliminate the potential for any disruption in the collection, validation, and storage of meter data required for customer billing in the transition from AMR to AMI. The AMI NOC will monitor the AMI meters and communications equipment 24 hours a day, seven days a week, 365 days a year. In addition, the AMI NOC team will perform remote troubleshooting of the meter and network. If an issue is determined to be meter-related, they will route the appropriate work order to the Company's meter operations and services organization.

VI. AMI Headend and Meter Data Management Systems

Overview of AMI Headend and MDMS

The AMI HES and the MDMS are critical elements for managing the large quantities of meter data generated by AMI meters. A HES is a hardware and software component of an AMI system, providing the primary interface between data extracted to and from the AMI communications network and, ultimately, the AMI meters. provides a diagram of AMI system components, including the HES and MDMS.

AMI Implementation Plan

The HES decrypts incoming meter data to be used in other systems and encrypts outgoing meter commands, ensuring the AMI system is secured end-to-end. For example, the HES encrypts and decrypts data associated with advanced meter functions like service switch reconnections and pinging of the meters to confirm outages or service restorations status. The purpose of the HES is not to store or process the meter data, instead to pass the decrypted data to specialized systems like the MDMS.

The MDMS collects and stores meter data from the HES and processes meter data into information used by other utility systems such as customer systems and the OMS. The core MDMS functionality includes Validating, Estimating, and Editing ("VEE") meter reads before the reads are passed on to the customer billing system. The MDMS also filters power off/on notifications during large-scale outages to not overwhelm the OMS with thousands of individual meter outage notifications. The MDMS can also perform some basic analytics and will be able to provide rudimentary reports around theft and tamper detection.

To accelerate meter deployments in the field, the Company will assess opportunities to implement an interim MDMS solution that can provide core VEE functions and integrate with the Company's existing customer billing systems for its western and eastern MA service areas. This temporary solution will ultimately transition to a final MDMS solution with expanded integrations with other systems like the OMS.

A recent report by the American Council for an Energy-Efficient Economy ("ACEEE") highlights the significant untapped value proposition associated with utilizing the data collected by AMI system deployed to data.[1] For example, out of 26 utilities with AMI deployed, only one was

[1] https://www.aceee.org/sites/default/files/publications/researchreports/u2001.pdf

engaging in all six ACEEE business cases defined in 2018. The result is the missed opportunity to benefit from operational improvements and proven consumer safety and savings opportunities. To avoid this, the Company will select an MDMS that will fully support the advanced functionalities enabled by the new generation of AMI meters. Meter data management involves managing and analyzing the surge of data and information generated by the millions of meters in an AMI system. See the Customer Engagement & Education section and the Analytical Tools and System Integrations section for details on implementation of programs utilizing AMI data to support customer engagement and operational analytics.

Data points like customer usage data will be fed from the MDMS to other systems, including the Company's new customer information system to enable time-varying rates and the customer portal to provide energy usage insights and alerts. Other analytical data like voltage data will also be sourced from the MDMS to Eversource's analytics system to provide enhanced analytics use cases or other engineering applications like VVO.

AMI HES and MDMS Implementation Plan – Procurement of Products & Services

As described in previous sections, the Company will develop an extensive set of requirements for the AMI HES and MDMS that will meet business needs for a secure, cost-effective, and future-proof solution considering all opportunities to lower the total cost of ownership over the asset life cycle. The inclusion of clear and accurate requirements in the RFP process will be critical for evaluating, testing, and selecting the vendor for each component of the AMI system. The development of the RFP requirements will also include the evaluation and testing criteria, which the Company will use for final vendor selection.

AMI Implementation Plan

As described below, the Company will follow its established competitive procurement process to test and evaluate the proposed AMI HES and MDMS solutions. The Company expects that the HES will be packaged with the AMI meter proposals in a comprehensive procurement activity. These systems use proprietary technology to facilitate secure end-to-end communications between the head-end and the meters. The Company expects proposals for the MDMS solutions will be independent of the HES and the AMI meters. Thus, the Company will ensure the RFP for the MDMS component includes interoperability between the HES and the MDMS, and the use of open standards, as key requirements. The Company will develop requirements to evaluate proposed MDMS solutions on their capabilities with the VEE of AMI data. The Company will also include integrations into critical systems, like the customer system, the OMS, and the enterprise data platform (i.e., Microsoft Azure Data Lake) as part of the RFP requirements. The Company will evaluate the proposed MDMS solutions on their estimated costs and timetable to integrate with these critical systems, including the HES. In addition, the Company will request proposals for on-premise and cloud hosting solutions for the HES and MDMS, allowing the Company to evaluate the costs, risks, and benefits of these two options.

The Company expects its HES vendor selection will be based on the AMI meter due to the interdependence of the HES and the meters, however, the Company will consider any proposed independent HES solutions. It will evaluate these solutions on their capabilities to securely facilitate data exchange between the meters to the MDMS and enabling advanced meter functions like a remote disconnect. The MDMS vendor selection will be based on the proposed solution's performance against the testing and evaluation criteria and the overall cost of the solution.

Once the Company makes a final vendor selection, it will begin contract negotiations. Contract language and statements of work will be crafted with precise requirements and accountability for

specified milestones and deliverables over the course of the project implementation and warranty periods. The Company will develop a contracting strategy for on-premise or cloud-hosted solutions to ensure either solution is implemented according to the company's business needs and expectations. For example, suppose the selected HES vendor is different from those selected for the MDMS or AMI meters. In that case, the Company will ensure all parties agree to a contractual obligation to provide mutual support in integrating their respective systems.

AMI HES and MDMS Implementation Plan – Planning Activities

The Company will develop a cost-effective deployment and integration strategy for the HES and MDMS that will utilize internal and outsourced labor resources. These systems will also require dedicated labor resources for planning, system integrations, testing, and deployment of the HES and MDMS. In addition, following the deployment period, the Company will require labor resources to maintain these systems and their integrations.

As described below, the Company will finalize a detailed deployment schedule and budget for the entire AMI system after completing the RFP process. The Company expects to deploy the communications network and the accompanying HES and MDMS approximately six months before the first AMI meter deployment. The Company will develop metrics that will ensure the HES and the MDMS, and their integrations with other systems, are completed in time to support the AMI meter deployment schedule. Examples of these metrics include cost and schedule variance, schedule performance index, and resource utilization. Adherence to these metrics will be part of the contract between the selected vendor(s) and the Company.

The Company will also develop AMI operations metrics for the software system components to help monitor any ongoing post-deployment issues experienced by any systems utilizing AMI data.

That will ensure post-deployment meter issues are quickly resolved. The Company will develop these metrics as part of its overall AMI operations plan, including communications network monitoring and optimization efforts. Once an AMI meter is installed, it becomes part of the communications network, so the Company will develop metrics that will distinguish between the meter and network issues. For example, AMI meters are experiencing intermittent communications issues that are not being exhibited by nearby meters in the local area. These metrics will facilitate troubleshooting and monitoring efforts as the AMI network, and the number of deployed AMI meters expand.

Meter Implementation Plan –Deployment, Operations, and Maintenance Activities

The Company expects the planning, integration, testing, and deployment of the HES and the interim MDMS solution will be done in parallel over a one and half year period. These two systems must be completed before the first AMI meter is deployed. The deployment schedule will ensure that communications infrastructure will be in service in advance of meter deployment to eliminate the potential for any disruption in the collection, validation, and storage of meter data required for customer billing in the transition from AMR to AMI. The software for the AMI NOC will have a direct integration to the HES, facilitating secure remote troubleshooting of network equipment and meters. The MDMS will be maintained by the same resources currently maintaining the Company's existing MDMS supporting its AMR system. Both the HES and MDMS will be monitored through the AMI NOC, and the Company's cybersecurity team will monitor the systems 24 hours a day, seven days a week, 365 days a year.

VII. Cybersecurity

Overview of Cybersecurity

The deployment of AMI meters, the supporting communications network, and software systems will require multiple layers of security to ensure that customer and company data is kept secure and private. Measures to enhance confidentiality, integrity, and availability of data are also part of this effort. The bulk of the cybersecurity costs will occur during the deployment of the AMI meters and the communications network. The Company will also implement additional cyber protection measures as we develop other customer-oriented analytics use cases.

Cybersecurity and Privacy Requirements - Procurement of Products & Services

Cybersecurity will be a critical requirement for every single component of the AMI system. Therefore, as part of its cybersecurity plan, the Company will be including cybersecurity technical requirements in the RFP of each component. In addition, every component of the AMI system will be evaluated on its capability to meet or exceed the Company's cybersecurity technical requirements for configuration management, encryption, logging and monitoring, and physical access controls for employees and vendors.

As described in the Eversource Grid Modernization Cyber Security Plan [Exhibit xx], grid modernization programs like an AMI system will utilize various operational and customer data types. AMI data will be developed and collected as part of managing the power grid and will be used to improve the efficiency and resiliency of the grid. The Company may use the customer data such as (but not limited to) usage data, customer address, or account number in the aggregate or original form for this analysis. However, Eversource uses the minimal amount of data necessary,

depending on the nature of the analysis. Therefore, where feasible, the Company will use aggregated data or anonymized data.

As is stated in the Eversource Privacy Policy in the Grid Modernization Cyber Security Plan, the customer has the right to know what data is collected and what it is used for. If Customer data is found to be incorrect, then the customer can correct it. The Privacy Policy also discusses when the Company can give customer data to a third party. If Eversource has a contractual relationship with the third party, Eversource will ensure the third party has sufficient controls to protect the data. Where Customer data is given to a third party because of a customer request or as part of a regulatory ruling, Eversource has no authority to assess the controls of the third party. For more information on the Company's data privacy policy, including consumer notice and awareness, customer data access and participation, information sharing and communications, and integrity and security of customer information, please see Exhibit ES-AMI-2, Appendix B.

Cybersecurity Requirements – Planning, Deployment, Operations, and Maintenance Activities

The Eversource Grid Modernization Cyber Security Plan requires that any new system procured by the Company go through a formal questionnaire referred to as the Corporate Information Security Risk Assessment Questionnaire ("CISRAQ"). This evaluation will be part of the contract negotiations for each selected vendor and their component(s). In addition, if the system or component includes third party access to data storage, process, or transmission of Eversource non-public information, the third party must complete a due diligence questionnaire ("DDQ"). This document describes the internal security controls used by the 3rd party to protect the provided data. If the controls are deemed unacceptable, the third party must make the necessary changes, or the data will not be authorized for release.

The Company performs application vulnerability scans as part of the System Development Life Cycle ("SDLC"). During final system testing, the scans are conducted to ensure that no critical security vulnerabilities exist before deploying the system. These scans are also part of the ongoing maintenance of these systems and occur on major system changes. The Company will integrate the AMI system components into the SDLC. The Company will continue to implement additional security measures as appropriate based on vulnerabilities found during SDLCs, government or vendor guidance, on an ongoing basis. In mutual support of the AMI NOC, the Company's existing security monitoring center will provide 24x7, 365 days a year monitoring of all AMI system components. The Company's cybersecurity monitoring center is staff by experienced cyber professionals who follow documented procedures for responding to alerts originating from the automated monitoring system.

VIII. Customer Engagement & Education

AMI provides several benefits and capabilities that allow customers to better understand and control their energy usage and bills. It also provides near real-time usage information that can be accessed via multiple channels, such as website, mobile app or by speaking to a Company customer service representative. In addition, AMI provides near real-time usage insight and enables time-varying rate ("TVR") choices that can give customers more control over their energy bills.

To help guide and educate our customers about smart meters and the benefits and capabilities they enable the Company has developed a four phase Customer Engagement Plan as provided in Exhibit ES-AMI-2, Appendix C. These four phases are:

AMI Implementation Plan

1. ***Awareness***

Once the AMI plan has been approved, the Company will begin incorporating awareness and education on AMI meters into existing communications plans for customers, a clean energy future, grid modernization and energy efficiency. A dedicated space will be created on the Eversource website that customers can use as a resource to learn more about AMI meters.

2. ***Deployment***

This next phase moves from general customer understanding and education to a targeted approach. The Company will continue to maintain information on AMI in general communication channels, it will also begin targeting communities that are scheduled to receive their new meters.

3. ***New Energy Insight and Ways to Save***

Once customers have an AMI meter installed, the Company will continue to educate and engage customers in energy management solutions, using more near- and real-time and granular data available with AMI. The post-deployment phase will focus on customer usage insight and "actionable ways to save."

4. ***Time-Varying Rates***

Once all AMI meters have been deployed, the Company will build awareness and educate customers on time-varying rates. As with the other phases, the communication channels used will include customer email; on-bill messaging and inserts; free social media; online

videos; press releases and earned media; direct mail; print collateral (i.e., door hangers/brochures); town halls; dedicated place on the Eversource website; and paid social media campaigns.

From the time the AMI plan is approved, an internal team will be conducting customer research through every communication phase. Initial research will provide a baseline of what customers already know about AMI so the Company can tailor future communications accordingly to maximize effectiveness. Without the need to rely on an outside vendor to manage and conduct customer experience research, customer research can be quickly modified to gather needed feedback and results can be communicated quickly to project stakeholder and deployment teams.

Exhibit ES-AMI-2, Appendix C provides further detail on each of these phases and the Company's overall communications strategy. This approach will support customers in first understanding what the technology can provide, then explain how the change will happen, and how they may benefit by enrolling in new programs.

IX. Customer System

Overview of Customer System

The customer information system ("CIS") is one the most strategic and mission-critical information technology ("IT") systems within a utility. The CIS underpins a utility's ability to provide high-quality customer service by facilitating and managing virtually all interactions between a utility and its customers. The CIS also serves as a central repository of customer, billing and account history data that is utilized by numerous other internal IT systems such as the load planning, outage management and general ledger systems.

AMI Implementation Plan

A modern CIS is a prerequisite to support the full range of AMI benefits. The Company's current CIS is not capable of billing time varying rates at the scale required to support an AMI deployment. In addition, a modern CIS is necessary to provide rate-based information to customers, including high bill alerts.

Capabilities within a CIS are typically organized around the major business processes it supports including:

- **Billing** – the ingestion of reads from a metering system and the calculation and generation of customers' bills based upon the stored tariffs in the CIS;
- **Customer care** – the handling of customer calls and inquires (both live and automated) by providing information to the utility's agents and the customers directly such as usage history, amounts owed, payments made, and available programs and services;
- **Credit and collections** – the calculation and tracking of past due amounts and payment arrangements including the interaction with third-party agencies that provide low-income assistance as well as parties which help collect overdue amounts;
- **Start/stop service** – the initiation of service for new customers with the utility and the suspension and/or termination of accounts no longer serviced by the utility;
- **Field Services** – the coordination with downstream utility systems that help manage the utility's field workers to initiate connect, disconnect, on demand reads, investigations and other services that involve visits to a customer's premise; and
- **Online Self-service** – the CIS enables the Customer My Account experience – 90 percent of the reason customers come to our web is to access their account information. The CIS now powered with AMI information is the engine that creates this experience.

AMI Implementation Plan

The primary users of the CIS are our customers. With so many digital customer channels available for access: web, mobile app, text, and more on the horizon, such as Alexa, customers are choosing to self-serve. More than 87 percent of all customer transactions are completed by the customer through self-service options. And these transactions are powered by the CIS.

The primary users of the CIS are the contact center agents (the front-office) who spend much of their day logged into the CIS and communicating directly with customers. Customer inquiries and commitments, along with the agents' notes related to the call or chat, are recorded in the CIS. Meanwhile, more complex interactions that require additional investigation are handled by billing technicians (the back-office) who work directly with information stored within the CIS and other systems to help resolve customer inquiries. Numerous other departments and utility employees rely upon the CIS to perform their duties, including:

- **Distribution engineers** – utilize usage information in the CIS to plan system extensions and upgrades;
- **Marketing** – utilizes usage and payment information in the CIS to research customer needs, preferences and behaviors, and design new services and programs for customers;
- **Rates Department** – utilizes usage information to perform rate planning and analysis;
- **Field technicians** – utilize account information to verify service addresses and schedule appointments.

The benefits of a modern CIS typically fall within three broad and overlapping categories: (1) risk mitigation, (2) enhanced customer capabilities, and (3) greater cost-effectiveness.

AMI Implementation Plan

Risk Mitigation

Most "legacy" CIS platforms (based on software engineered around year 2000 and before) were built using languages and technologies that are becoming obsolete. While many legacy CIS systems have been optimized over time to produce accurate bills in a cost-efficient fashion, the ability to modify these systems to support new customer demands and programs is costly and carries significant technical risk. For example, leading, modern CIS platforms support more flexible rate structures such as Time Varied Rates (TVRs) and distributed generation natively through configuration. Modifying a legacy CIS to support TVRs requires a substantial architectural overhaul, and in some cases may not be possible. As the pace of change in customer expectations has increased, the cost and complexity of building and sustaining those capabilities in legacy CIS has also increased.

This dual threat of increasing complexity with decreasing know-how has created risk for utilities and is one of the leading reasons why a majority of IOUs have sought the benefits of a modern CIS.

Enhanced Customer Capabilities

Customers have come to expect convenience, speed, and personalization when interacting with their utility providers. Although utilities continue to handle a large volume of inbound calls, customers show increasing interest in being able to conduct business via digital channels such as the utility website, chat, and mobile apps. Modern CIS platforms enable this broader set of customer capabilities in a variety of ways including:

- Modern CIS employ microservices which allow real time ancillary applications like a utility's website, Interactive Voice Response ("IVR") system and mobile apps to access data and capabilities within the CIS more readily, providing a broader range of self-service options.
- Modern CIS support real-time transactions which, for example, allow payments to be applied as they are made (so the customer can be confident her bill has been paid in a timely fashion).
- Modern CIS have robust data models that can provide customers greater insight into their consumption patterns, projected bill amount, and tips for greater conservation. These data models also benefit the utility though access to a richer set of customer data.
- Modern CIS utilize a more flexible architecture, including use of the cloud, which allows new capabilities to be deployed more rapidly and with greater security.

Greater Cost-Effectiveness

As legacy CIS platforms become antiquated and complex, sustainability costs generally increase due to three primary factors.

First, the complexity of the legacy CIS often makes meeting changing customer and regulatory requirements time consuming and expensive. Since legacy CIS are generally utility specific, the cost for any enhancement must be borne by that utility. Normal project activities such as testing, for example, need to become much more robust on legacy CIS than when working on a modern CIS to avoid unintended consequences. Modern CIS platforms such as Oracle and SAP are deployed at hundreds of utilities globally and possess product roadmaps that seek to address the

customer and regulatory demands that its clients are facing. This translates to lower customization and enhancement costs for modern CIS.

The second primary factor are labor costs. Utilities running legacy CIS experience a year-over-year loss of available people who are skilled in supporting a utility's legacy CIS (often the loss is due to retirement). This not only presents operational risk, it also often translates into higher costs as utilities seek to supplant that loss of knowledge with third-parties or incentives to retain talent. By contrast, modern CIS platforms are implemented and supported by numerous global and niche firms, creating a robust marketplace for skilled labor in the latest technologies.

The third factor contributing to the greater cost-effectiveness of modern systems entails the ability to automate activities handled manually or inefficiently by the legacy CIS. Many users of legacy CIS are forced into building manual workarounds to address the inabilities of the system. Common examples include billing for complex rate structures; tracking Net Energy Metering pricing plans; generating consolidated bills for multi-account customers; and providing call center agents and customers the ability to quickly compare utility rates. In contrast, modern CIS platforms support most utility requirements natively, reducing the need for manual support. In addition, modern CIS platforms include robust workflow and reporting tools which drive greater efficiency and better decision making.

Customer System – Procurement of Products and Services

The Company will develop an extensive set of requirements for the CIS that will meet business needs for a secure, cost-effective and future-proof solution considering all opportunities to lower the total cost of ownership over the asset life cycle. The inclusion of clear and accurate requirements is critical for evaluating, testing, and selecting the vendor for each component of the

AMI system. The development of system requirements will include the evaluation and testing criteria. The Company will follow its established competitive procurement process to evaluate systems integration services and other vendor proposed CIS solutions that will be needed to provide the labor to integrate the CIS to the MDMS. The Company will develop requirements to evaluate proposed CIS solutions on their capabilities to support the proposed AMI benefits. The CIS integration to the MDMS will be complex and will require extensive planning and project management resources to ensure success. The Company will select vendor(s) with the necessary experience and expertise to integrate CIS with the MDMS. The Company's PMO organization will be critical in ensuring these complex integrations are completed on time and within budget. The Company will follow its established evaluation process for system integrators, with metrics like the experience of key resources being proposed by the vendor (i.e., subject matter experts' experience with the particular system in question); experience with other utilities doing similar work; proposed project schedule; and estimated costs. The Company will also include integration of the CIS to other critical systems, like the OMS, and the enterprise data platform (i.e., Microsoft Azure Data Lake) as part of the requirements development process.

The Company will evaluate the proposed CIS product solutions and the system integrator on their estimated costs and timetable to integrate with the MDMS. In addition, the Company will evaluate options for on-premise and cloud hosting solutions for the CIS solution, allowing the Company to evaluate the costs, risks, and benefits of these two options.

Contract language and statements of work will be crafted with precise requirements and accountability for specified milestones and deliverables over the course of the project implementation and warranty periods.

AMI Implementation Plan

Customer System –Planning Activities

The Company will develop a cost-effective deployment and integration strategy for the CIS that will utilize internal and outsourced labor resources. CIS implementation will require significant numbers of dedicated labor resources for planning, system integrations, testing, and deployment.

As described in previous sections, the Company will finalize a detailed deployment schedule and budget for the entire AMI program as a part of its program management process. Based on discussions with industry experts, the Company expects that a CIS implementation of the size and complexity of the one contemplated by Eversource will take approximately four years for planning, design, construction, testing and post-production support.

As dictated by the meter deployment strategy objective of replacing meters on a schedule that minimizes early retirement while addressing aging asset conditions, the Company expects to begin meter installations in the second half of 2024. This timeline requires the requisite communications and back-office systems are in-place to ensure no disruption in customer billing in the transition from AMR to AMI. The Company expects to deploy the communications network and the accompanying HES and MDMS approximately six months before the first AMI meter deployment. Once meter deployment begins, data will be transmitted securely over the network to the HES and MDMS. Once VEE processes are complete, these data will be used by existing systems to calculate and produce bills using existing rate designs.

The four-year CIS project will begin as soon as possible as required to unlock the full potential of AMI. The Company will develop metrics that will ensure the CIS and its integrations with other systems, including the MDMS, are completed in coordination with the overall AMI program schedule. Examples of these metrics include cost and schedule variance, schedule performance

index, and resource utilization. Adherence to these metrics will be part of the contract between the selected vendor(s) and the Company.

Customer System – Deployment, Operations and Maintenance Activities

Following the deployment of the CIS and the completion of all necessary system integrations, the Company will require labor resources maintain these systems and their integrations. The Company will develop AMI operations metrics for the software system components to help monitor any ongoing post-deployment issues experienced by any systems utilizing AMI data. That will ensure post-deployment meter issues are quickly resolved. The Company will develop these metrics as part of its overall AMI operations plan, including communications network monitoring and optimization efforts. As with all of the Company's IT systems, the CIS will be monitored by the Cybersecurity organization and will be subject to the same cybersecurity evaluations during is life cycle, ensuring any cybersecurity vulnerabilities and risks are identified before they can impact the AMI system.

X. Analytical Tools and System Integrations

Overview of Analytical Tools and System Integrations

Dedicating effort to ensure that the Company is building the people, process, and technology capabilities to take full advantage of the wealth of data provided by AMI will ensure benefits are maximized in the near and long terms. The Company will evaluate all available options that will enable the analysis of AMI data and provide actionable insights and alerts. For example, there are off-the-shelf analytical tools, and the Company also has internal resources that can create dashboards and reports. Operational systems like the OMS and CIS require a permanent integration into the MDMS. The MDMS will be the source of AMI data for several of these

operating systems and analytics tools. To that effect, the Company will develop MDMS integrations with the following operating systems:

Outage Management System ("OMS")

The Company's existing OMS has the capability to interface with an MDMS. With the required enhancements, the OMS can receive AMI meter data like power out/power restoration, improving the Company's ability to respond to outages. The OMS will receive data from the MDMS and perform additional analytics like nested outage identification and will also have the capability to interrogate or 'ping' meters to verify the service status of meters. The benefit of providing remote interrogation of meters through integration with the Company's OMS is expected to be most significant in major, multi-day events with vast numbers of trouble spots. In these events, power is restored first to the system backbone. Typically, this leaves smaller pockets of outages undetected for a period, limiting restoration efficiency at the tail end of the event.

As a result, the expectation is that with AMI, there will be an improvement in reliability for nested outages at the tail end of major events. The ability for the OMS to 'ping' AMI meters is facilitated through the AMI head-end system, with the request and response filtered by the MDMS. The data sharing between the OMS and head-end through the MDMS will require close to real-time data processing. The Company will ensure compatibility between these systems through a rigorous request for proposal ("RFP") to vet the proposed solutions against the requirements to achieve the Company's AMI enhanced system reliability goals.

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Volt Var Optimization ("VVO") system

The Company's VVO program will benefit from voltage data from AMI meters located along distribution lines. In particular, AMI will be beneficial at the end of lateral circuits that are typically unsuitable for standard, low-cost overhead line sensors. Overhead line sensors use electromagnetic induction to power their internal sensors and communications components and require a minimum constant current on the overhead line to harvest enough power to stay in operation. The end of single-phase laterals typically carries a lower current load, which tends to be below the minimum current required by the overhead line sensor. The Company deploys line sensors that have a separate distribution transformer to provide power to the line sensors to circumvent this issue. This alternative solution and its installation are more expensive than the inductively powered sensors. Currently, the Company deploys battery-powered overhead line sensors to avoid this issue, requiring more frequent maintenance and replacement of the battery than inductively charged line sensors.

As the capability of VVO software to incorporate AMI data improves there will be numerous opportunities to leverage data for improved optimization. In the near term, the Company will use internal resources to develop reports and dashboards to monitor voltages along VVO feeders. Because of this increased level of visibility, the Company will be able to support more aggressive, feeder specific, VVO programs, providing an incremental increase to the efficiency of the grid already achieved by its existing VVO program. The AMI voltage data for these reports will be sourced from the MDMS. Once the VVO control system can accept AMI voltage data directly, the Company will develop an integration

between the VVO control system and the MDMS, allowing the VVO system to respond to voltage violations (below or above state thresholds) automatically.

Customer Engagement Systems

The Company will develop integrations with existing and future customer engagement systems. An AMI system can enhance the Customer's experience with several functions. For example, an AMI system can enable customers to self-schedule their move-in/move-out to a specific date and time with the proper enhancements. However, due to privacy and cybersecurity concerns, the Company will first perform the necessary assessments to ensure these features and capabilities are safe and secure.

Other Systems

The Company will make AMI data available for other systems. The Company's 2021-2025 Grid Modernization Plan describes the use of AMI data to enhance system planning analyses relative to DER analysis. Analytical tools can use AMI data to uncover valuable insights into grid operations. For example, AMI voltage data can help engineers understand the effects of DER penetration with much greater levels of data granularity relative to current tools. The Company can use AMI data in systems like the DMS or DERMS to enhance or enable advanced functions. For example, the DMS can use granular AMI load data to improve and verify the load flow model, a critical function of the DMS. The DERMS can utilize AMI data to identify the peak load for each feeder. The Company can potentially use this information to identify the locational value of DERs in an individual feeder and utilize demand response, energy efficiency programs or other use cases, potentially reducing the need for traditional distribution system upgrades.

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The Company will also develop integrations that will enable several data analytics functions. The Company will utilize its existing Microsoft Azure database and Microsoft PowerBI software to create dashboards and other analytical tools. Use cases that require relatively fresh data from the AMI system will source their data from the MDMS. For use cases that do not need close to real time AMI data or are used for historical trending analysis, they will source their data from the Microsoft Azure database. In addition, the Company will utilize internal resources to create dashboards with the Microsoft PowerBI system. Some of the use cases the Company will develop include, but are not limited to:

Outage Reporting

Operational reports and dashboards to enhance outage prediction and restoration.

VVO Scheme Improvement

Engineering reports and dashboards that provide historical summaries of the performance of the VVO schemes down to the individual feeder level and reports for voltage violation (low/high voltage) alerts and their locations.

Transformer load management

Engineering reports that provide peak loading for individual distribution transformers. Overloaded transformers or within certain loading thresholds can be flagged for remedial action.

Customer-focused information

Dashboards and reports for customer service representatives can provide many metrics and alerts on customer energy usage and other statistics. These dashboards and reports can also

be provided to customers, showing them their specific and private energy usage data. This information can educate customers on their energy usage and ways to save money by reducing usage and taking advantage of energy efficiency programs.

The Company will also explore distributed intelligence and other off-the-shelf analytical tools that support the analysis of AMI data while minimizing costly integrations with existing enterprise systems. These tools include grid operations applications (e.g., outage management, transformer connectivity verification, and load management). For example, off-the-shelf, web-browser based outage management tools pull meter outage notifications directly from the AMI head-end. This type of tool would be an interim solution until the completion of the MDMS-to-OMS integration. The tool allows users to monitor outage alerts, validate and update outage status with meter pings and discover nested outages during restoration efforts. In practice, system operators can use the tool to supplement the information in the OMS. The Company can implement these tools relatively quickly, as they are cloud-hosted and only require rudimentary data extracts from the Company's GIS and asset management systems.

Analytical Tools and System Integrations - Procurement of Products & Services

The Company will evaluate all available options for analytical tools, including on-premise and cloud-hosted solutions. As described previously, the Company can quickly implement off-the-shelf analytical tools. Most of the required work is in the system integrations that facilitate the data exchange from the HES, MDMS, or other systems, depending on the nature of the analytical tool and the use cases it enables. The IT resources required for the systems will be provided by the Company's IT professionals or outsourced from the vendor providing the analytical tool solutions. The Company will develop metrics to evaluate these options, likely based on the cost

of each option, how quickly it can enable associated benefits from the AMI data, and its ongoing maintenance costs. In addition, the Company will follow its cybersecurity assessment process as described above in its assessment of these.

System integrations like the OMS will be more complex and require extensive planning and project management resources to ensure success. The Company's PMO organization will be critical in ensuring these complex integrations are completed on time and within budget. For these complex system integrations, the Company will go through an RFP process to procure a system integrator, an outsourced resource vendor that can provide the required expertise for the AMI integration particular to each system. The Company will follow its established evaluation process for system integrators, with metrics like the experience of key resources being proposed by the vendor (i.e., subject matter experts' experience with the particular system in question), experience with other utilities doing similar work, and their proposed schedule for the project and estimated costs.

Analytical Tools and System Integrations – Planning, Deployment, Operations, and Maintenance Activities

The Company expects the planning, integration, testing, and deployment of the analytical tools and system integrations to begin a year before the first AMI meter is deployed, with new analytical tools and system integrations to occur as they are needed and able to be completed. Solutions that are dependent on a permanent MDMS will be assessed after that system is deployed. In addition, as mentioned above, the Company will explore off-the-shelf analytical tools that can utilize the AMI data directly from the HES and enable the Company to actualize the benefits in outage restoration, grid optimization, and other operational benefits.

As with the other AMI system components, once a vendor is selected, in this case, a system integrator, the Company will begin contract negotiation. The contract will hold the vendor

accountable to mutually agreed-upon metrics. It will help the Company track the progress of the integrations, identify any issues that may delay or cause a budget overrun, and mitigate these issues expeditiously before they have any significant impact on the project. Through this process, the Company will develop a detailed project deployment schedule, and progress will the tracked with the help of the metrics described previously. The Company will negotiate and plan for post-deployment support of the system integration or analytical tools. As described in the Cybersecurity section above, the Company will continuously monitor the system for any cybersecurity threats and vulnerabilities throughout its life cycle.

XI. External Reporting and Transparency

Implementation of AMI is a large, multi-disciplinary and complex undertaking that will extend over several years with benefits and outcomes accruing over the entire life cycle of the AMI system assets. A project of this magnitude requires an organized and comprehensive focus on project and risk management. As described above, the Company's implementation plan is designed to maximize outcomes of AMI in terms of customer engagement; support for clean energy technologies; grid planning and optimization and operational efficiency.

Providing transparency to the Department and other external stakeholders on progress relative to the steps outlined in this implementation plan will ensure that the Company is delivering on its commitment to execute deployment of this important technology in the most secure, reliable, resilient, flexible, customer focused and cost-effective manner possible.

As Eversource progresses into the final stages of planning, including completion of its RFP process to select vendor partners for hardware, software and services, the Company expects to provide the

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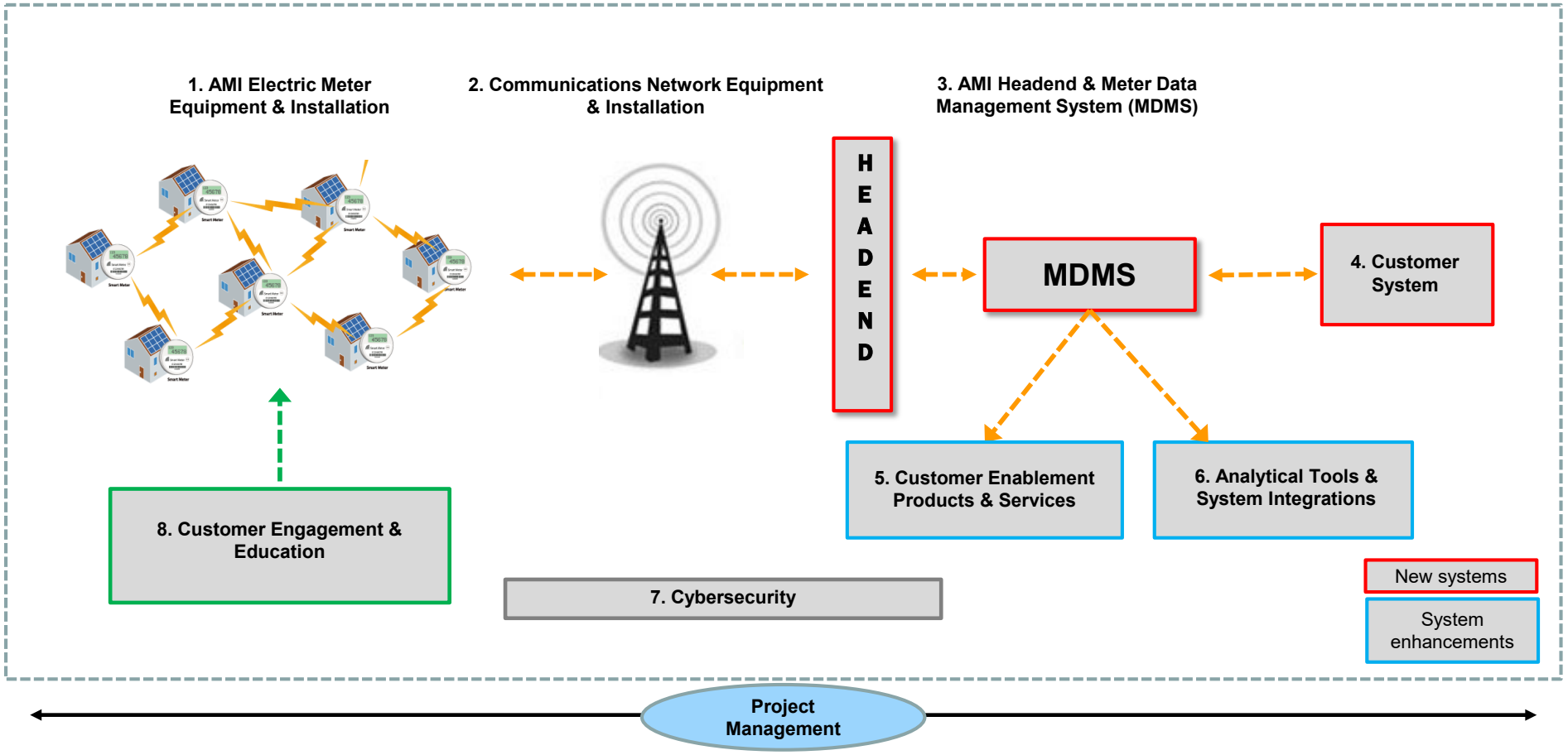
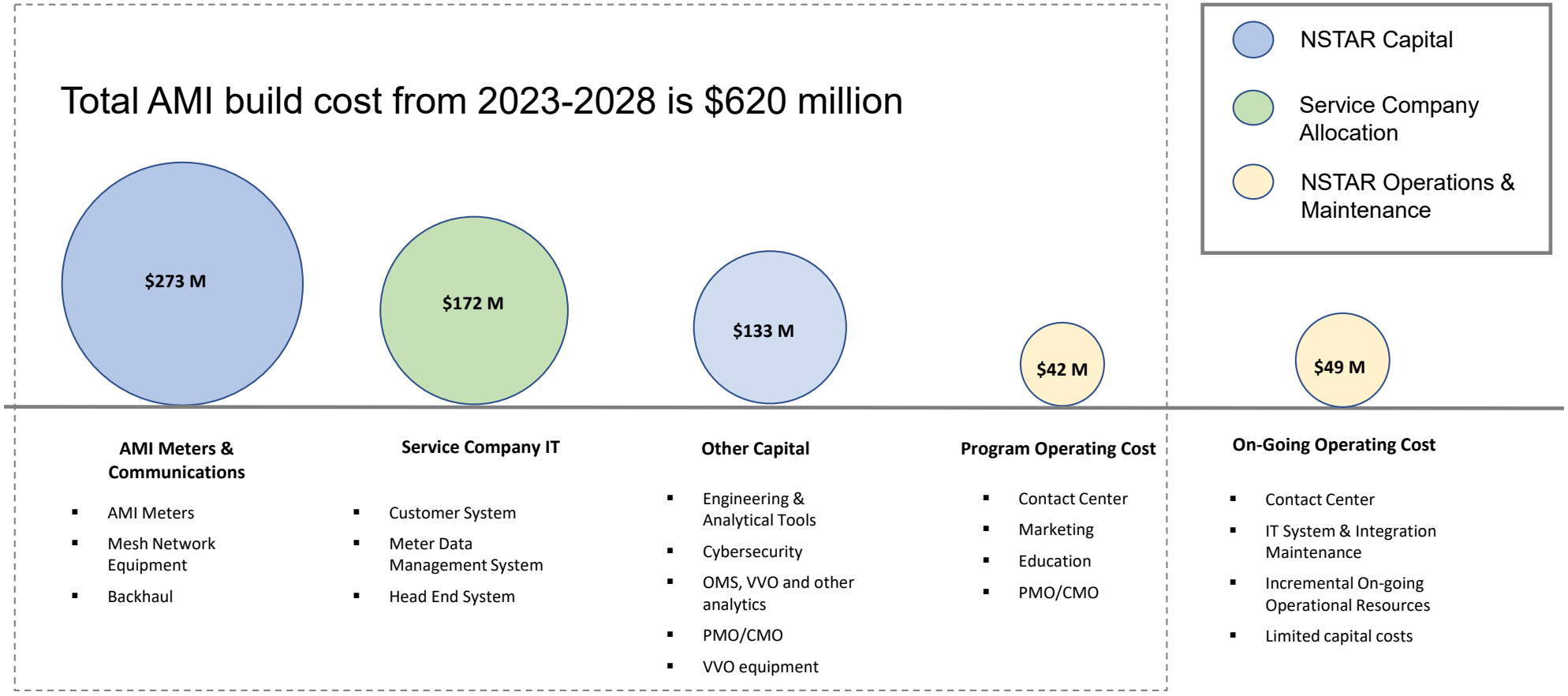
Department and other stakeholders with more detailed implementation plans with respect to scope, schedule and budget. Once the deployment period has commenced, it will be important for the Company to provide regular status updates relative to implementation metrics, including narrative descriptions of outcomes achieved, challenges, lessons learned and next steps. These implementation reports should reflect progress relative to expectations on the final AMI project scope, schedule, and budget. In addition to reporting on equipment and software deployment progress, the Company expects to provide updates on its customer engagement and outreach activities.

In finalizing the content of these updates, Eversource will work with the Department and other stakeholders to identify metrics and other implementation updates that are objective, based on observable data and reflect activities and outcomes that are under direct control of the Company. To every extent possible, the Company will work with other Massachusetts EDCs to ensure consistency in tracking and reporting cadence and content.

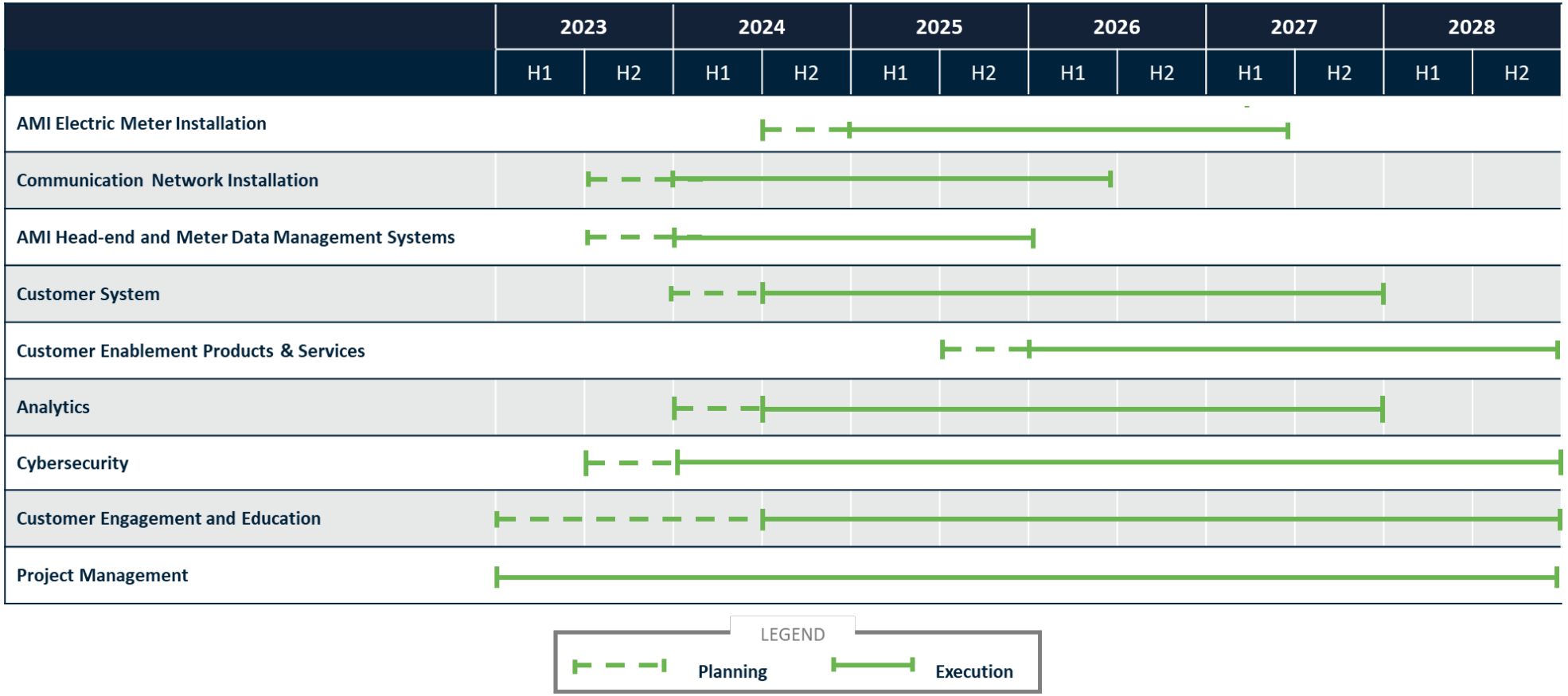
AMI Project Components



AMI Project Cost Components (2023-2028)



AMI Project Schedule



Eversource Grid Modernization Cyber Security Plan

Revision 1

Approved Process Owner: Signature: Christopher Leigh

Name: Christopher Leigh Date: June 18, 2021

Title: Director & Chief Information Security Officer

Effective Date: June 18, 2021

Applicability: Eversource

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Eversource Grid Modernization
Cyber Security Plan

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Eversource Grid Modernization
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Eversource Grid Modernization Cyber Security Plan

1. CONCEPT OF OPERATIONS

1.1 Purpose

The Eversource Grid Modernization Cybersecurity Plan is a summary of Eversource's Cybersecurity Program related to ensuring the security of Grid Modernization technologies and data. The detail and rigor of cybersecurity controls get stronger based on the criticality of the system and data that Eversource is protecting. This plan will focus on the Cyber Security program that is or will be used to protect all Grid Modernization initiatives and the program for protecting Customer data.

1.2 Overview and Cyber Security Approach

Eversource Energy's overall approach to cybersecurity follows in principle the NIST Guidelines for Smart Grid Cyber Security, NISTIR 7628, and the DataGuard Energy Data Privacy Program, developed by the Department of Energy (DOE). Use of these standards ensures that security measures and risk management efforts align appropriately with the priority of Grid Modernization processes and technologies for which Eversource is responsible. The frameworks also provide a common means of organizing Eversource's diverse array of cybersecurity activities to prevent gaps in coverage. It also enables a rigorous and integrated process for managing a necessarily complex Operational Technology (OT) and Information Technology (IT) environment and melding it with business needs, risk management processes, and all of the various resources that are applied to effective cybersecurity. The Corporate Information Security (CIS) services, policies, and standards apply to all business units and operating entities. Each operating entity also has specific security requirements in place to address specialized technology used within each service territory (such as different software and hardware used in control systems in the field). Eversource applies leading security principles and practices to protect the infrastructure, computer networks, and data (Eversource and Customer) from cyber-attacks. This includes a *defense-in-depth* strategy where *best of breed* specialized security technology is used, such as host- and network-based firewalls, intrusion detection/prevention systems, virus and anti-malware protection, file encryption, content filters, network segmentation, and vulnerability scanners to further reduce risk of compromise.

Various aspects of this cyber security program will be periodically assessed using internal and external expertise to ensure effective operation. CIS enforces this security architecture with strict policies and procedures.

2. Risk Management

The objectives of the risk management processes are to evaluate initial and ongoing protection of Grid Modernization initiatives identify, analyze, and mitigate risk to the network and data, ultimately ensuring greater reliability and resiliency of service to the customer. The Grid Modernization Cyber Plan leverages existing Corporate Risk Management practices and adopts them as needed.

2.1 Overall Enterprise Risk Management Program

Within the overall risk management program, cybersecurity risk is considered as an enterprise corporate risk through the risk assessment process conducted by the Enterprise Risk Management Department (ERM). The ERM program involves the application of a well-defined, enterprise-wide methodology designed to allow the Risk Committee, comprised of the senior officers and directors, to oversee the identification, prioritization, mitigation, and reporting of principal business risks such as cybersecurity. The ERM program is integrated with other assurance functions throughout Eversource, including Compliance, Auditing, and Insurance to ensure appropriate coverage of risks that could impact the company. To support the ERM process, the Information Security team performs annually, a detailed Cybersecurity Risk Assessment based on the NIST 800-30. This assessment includes reviewing known threats and the Eversource Cybersecurity Risk register to assess areas requiring additional mitigation plans. The Information Security organization also identifies emerging risks to the company, through participation in industry groups, discussions with management and in consultation with outside advisers. Eversource management analyzes the risks to determine materiality and other attributes such as likelihood, impact, and mitigation strategies. Management broadly considers the Eversource business model, the utility industry, the global economy, and the current environment to identify risks. The findings of this process are periodically discussed with the Finance Committee of the Board of Trustees as well as with other Board Committees or the full Board of Trustees, as appropriate including reporting on how these issues are being measured and managed.

2.2 Cyber Security Risk Management Program

As Grid Modernization projects are identified, a formal questionnaire referred to as the Corporate Information Security Risk Assessment Questionnaire (CISRAQ). That evaluation holds the most knowledgeable person, usually the business owner or executive sponsor, responsible for gathering the necessary information used to assess the cybersecurity risk of the initiative. Prior to implementation, IT evaluates, tests, and approves all new technology requests, including proposed hardware, software, and/or configurations for consistency with established internal standards to ensure proper support, back-up and recovery infrastructure, and compatibility with other existing technology. In addition, if the initiative includes a 3rd party who will store, process, or transmit Eversource, non-public information, then a Due Diligence Questionnaire (DDQ) must be completed. This document describes the internal security controls used by the 3rd party to protect the data being provided. If the controls are deemed not acceptable, then changes must be made, or the data will not be authorized for release.

Planning, design, and implementation of all cybersecurity infrastructure, practices, procedures, and so on are based upon the above-referenced standards and practices. In its deployment processes, Eversource applies leading cybersecurity principles, including a *defense-in-depth* strategy. The approach uses layers of different, but complementary *best of breed* security technology to augment Eversource's protection programs. This approach is consistent with the security architecture proposed by DHS: *Recommended Practice: Improving Industrial Control Systems Cyber Security with Defense-In-Depth Strategies* (2009), and *DHS Strategy for Security Control Systems* (2009).

3. Cybersecurity Technical Requirements

Eversource manages the organization's Operational Technology (OT) IT assets, including both hardware and software, commensurate with the risk to critical infrastructure and organizational objectives. The requirements are intended to ensure the Confidentiality, Integrity, and Availability (CIA) of the systems and data. Consistent with NIST Guidelines for Smart Grid Cyber Security, NISTIR 7628, eversource has implemented a comprehensive cyber program to manage various OT and Grid Modernization technologies. These program requirements including in part, implementing appropriate impact assessments of the CIA triad, implementing appropriate access controls to the systems and data, Security Awareness training, Incident response procedures, media protection, and appropriate system development and maintenance procedures.

3.1 Access Controls

IT Policy describes the requirements for administering computer resources including establishing the process for granting and maintaining access privileges on Eversource's network and all associated computer resources and defines the responsibility and authority for the performance of access activities.

This policy is enforced by the Access Administration Procedure, which describes the access request process and requires use of the IT Service Request System. In addition, the access control policy defines the security requirements for IDs and passwords, and in part requires: use of unique identifier technologies such as a unique logon ID for each system user that is driven by a centralized Person Information Database used to track employees and contingent workers; User logon ID's must have strong complex passwords that are secured and not written down; Logon ID's are locked from use after a defined number of failed login attempts; For system accounts, default passwords must be changed periodically; and a Privileged Account Management system is used to limit access. All system access is driven by the *least privilege* principle and an access request must be properly approved before access is granted. Access is authorized only on a *need to know basis*. For remote access and for selected high-risk systems, two-factor authentication is required. In addition, a second set of authentication credentials are required where stronger password policies are enforced.

Termination procedures ensure that network and CIP access for terminated employees and contractors is removed upon receipt of notification. Employees receive periodic reminders to record all terminations prior to the effective date. Specific communications reminding the supervisor and their manager that terminations must be recorded in the HR system prior to the effective date. There is also a *for cause* emergency termination process that is used to remove system access immediately. Periodic access certifications with system owners are conducted based on system type as designated by corporate requirements. Unauthorized access is monitored for selected systems, an alert is generated requiring a review and disposition by the IT Security Department. Internal testing of the access administration process is conducted and overseen by the IT Compliance Department. Also, audits of the access administration activities are conducted by the Internal Audit Department and external auditors, as well as NERC and ISO-NE (Independent System Operators of New England).

Technologies deployed as part of Grid Modernization will utilized appropriate access control technologies to ensure only authorized devices are able to communicate with other devices, the transport network, and backend systems used to manage all devices and collect data. These technologies will include concepts such as digital certificates, ID/Password, or a combination for multi-factor authentication.

3.2 Configuration Management

Eversource has procedures for managing the deployment (including configuration) of technologies and understanding the baselines for proper operations. Baselines also assist in identifying unauthorized changes that could affect the safe and reliable operation of the device. All changes must be documented, approved, and tested for proper authorization.

3.3 Encryption

Encryption technologies are used to protect data while at rest, or in transit. Data at rest equates to data saved on magnetic media including in databases. Encryption at rest complements access controls to ensure that only authorized people or systems are able to decrypt and view or process the data. Encryption at rest also protects data when the media is removed from service. Encryption for data in transit prevents unauthorized access to intercepted data or "Man in The Middle" attacks. Both approaches ensure the integrity and confidentiality of the data.

Key management is crucial to ensuring the encryption process is secure. Encryption requires an "Encryption Key" which is a unique string of characters used to encrypt and decrypt the data. The longer the key, the stronger the encryption will be. Periodically changing the key also reduces the risk associated with a compromised key.

3.4 Logging and Monitoring

Collection of operational and event data is done for the purposes of ensuring proper operations of the Grid and system and to detect unauthorized access to customer data. Operational data can be used to proactively determine problems with a device before it fails, ensuring resiliency. Logging and monitoring are also used to identify malicious activity against or from the system. Devices will have differing capabilities of data logging. Based on risk and capabilities, technologies will be configured for appropriate logging. Monitoring of the data is performed to identify the issue and to respond. Eversource has a 24X7 security monitoring organization staffed with experienced cyber professionals who follow documented procedures for responding to alerts originating from the automated monitoring.

3.5 Physical Access Controls for Employees and Vendors

Because the cybersecurity environment includes physical elements (technology, equipment, and so on), it is important to provide some overview of aspects of Eversource's Physical Security Plan in the context of its relevance to cybersecurity. Eversource has extensive experience with physical security programs based on its work required to protect the bulk electric system. This experience includes ensuring that physical locations are protected with physical security perimeters. Access points and measures to control entry have been established. Procedures to monitor physical access have been implemented including the monitoring of card key access and other means. Security personnel are in place to control physical access on-site or at remote monitoring locations on 24 hours a day/7 days a week basis. Alarm systems, physical access logs, and human observation of access points are all methods used to monitor physical access to protect physical locations. Employees who lose their badge are required to report the event to Physical Security. Field devices will also have appropriate physical security controls to protect the device, network and data.

Eversource Grid Modernization
Cyber Security Plan

All new employees undergo thorough background checks before being granted any level of computer system access. Once cleared for employment, individual work needs are evaluated and formally reviewed prior to the employee being given very granular access (that is, access to systems that are in any way sensitive is granted only on a need-to-access basis). Similarly, physical access to areas with cyber sensitive equipment is granted only to those with a specific need. Procedures for all of these processes cover authentication, verification, tracking.

Termination procedures ensure that access for terminated employees and contractors is removed in a scheduled and timely manner. There is also a for cause emergency termination process that is used to remove system access immediately.

Periodic checks and audits are conducted to validate that appropriate access is in place.

4. Data Privacy

4.1 Data Ownership

Grid Modernization programs utilize various types of operational and customer data. Operational data are developed and collected as part of managing the power grid. This data is modeled and analyzed to improve the resiliency of the grid. Customer data such as (but not limited to) usage data, customer address, or account number may be used in the aggregate or original form for this analysis, however Eversource uses the minimal amount of data necessary depending on the nature of the analysis. Where feasible, aggregated data or anonymized data will be used.

As is stated in the Eversource Privacy Policy, the Customer has the right to know what data is collected and what it is used for. If Customer data is found to be incorrect, then the customer has the ability to correct it. The Privacy Policy also discusses when data may be given to a third party. Where Eversource has a contractual relationship with the third party, Eversource will ensure the third party has sufficient controls to protect the data. Where Customer data is given to a third party because of Customer request or as part of a regulatory ruling, Eversource has no authority to assess the controls of the third party.

4.2 Consumer Notice and Awareness:

Eversource has a published Privacy Policy available on the Eversource.com website. This policy answers various questions such as what information is collected, used, who it is shared with, how we protect it, what the customer can do to protect their information, and how the customer can access/correct their information. Updates to this policy are posted on the Eversource.com website.

4.3 Customer Choice and Consent:

Eversource may share customer information with third parties such as credit reporting agencies, as a means to providing services or if required by applicable law, regulation or enforceable governmental request. Information will also be shared when the customer provides written authorization to release information. Eversource has various processes to ensure third parties receiving customer data have reasonable controls to protect the data.

4.4 Customer Data Access and Participation:

Customers have the ability to view their data online at Eversource.com. Customers may also contact our call center with any questions regarding their account and data.

4.5 Integrity and Security:

Eversource uses a Defense in Depth strategy to safeguard customer information. This strategy uses layers of protection including physical controls, least privilege, access controls, encryption, monitoring and alerting, training, and third-party security reviews. These controls are independently audited and tested to ensure they are effective and current to address evolving threats.

To manage the business and to provide a high level of service to our customers, data may be aggregated or anonymized. Anonymized data results in the inability to identify the customer. Aggregated data is used in reporting of multiple customers data without being able to identify individual customers.

4.6 Self-Enforcement Management and Redress:

The Eversource Internal Audit department performs periodic, independent audits of policies and practices to ensure controls are in place and effective. Eversource also has a published Code of Business Conduct describing expected behaviors of employees and contractors.

5. Threat and Vulnerability Management

The objectives of the threat and vulnerability management processes are to establish and maintain plans, procedures, and technologies to detect, identify, analyze, manage, and respond to cybersecurity threats and vulnerabilities, commensurate with the risk to the organization's infrastructure (for example, critical, IT, operational) and organizational objectives.

The Threat Profile for Eversource Energy considers the various "Threat Actors" who may have intent to attack Eversource Systems and data. These Threat Actors include Cyber Terrorists, Organized Criminals, and Nation States. These Threat Actors may use various forms of malware including, but not limited to, ransomware, Remote Access Trojans, Root Kits, Worms, or Crypto-mining technologies. These Threat Actors intentions when using these tools is to either obtain persistence in the network for future use, disrupt business and operations systems, or compromise technical or customer/employee data.

Eversource uses the following threat information sources to incorporate into all threat monitoring technologies (In Priority Order):

- Department of Homeland Security
- Federal Bureau of Investigation
- Electric Sector Information Sharing and Analysis Center
- US- Center for Emergency Response
- DOE
- Others as necessary

5.1 Existing Systems

CIS applies leading security principles and practices to protect the infrastructure and computer networks from cyber-attacks including a defense-in-depth strategy. Eversource uses *best of breed* specialized security technology is used such as host and network-based firewalls, intrusion detection systems, virus and anti-malware protection, file encryption, content filters and vulnerability scanners to further reduce risk of compromise. This security architecture is consistent with recommendations from DHS's *Recommended Practice: Improving Industrial Control Systems Cyber Security with Defense-In-Depth Strategies*.

For deployed systems, periodic reviews and audits are conducted by internal and 3rd parties to ensure the security controls are functioning as designed. In addition, penetration tests and/or vulnerability assessments are conducted to validate the system security controls on a periodic basis.

All mobile devices including laptops, tablets, and smartphones must utilize encryption technologies to secure company data.

5.2 New Systems

There are many controls and processes used to validate systems in pre-deployment. CIS begins the security assessment process in the system purchasing phase by including security requirements in the request for proposal (RFP) and scoring security levels in the proposal evaluations. A security risk assessment process known as CISRAQ is required by the Methodology for Project Management. In addition, security approval is required as part of the change management process for any new systems deployed in the IT-supported production environment.

5.3 Outside Services

The IT Security team monitors multiple threat advisory services such as Industrial Control Systems Cyber-Emergency Response Team (ICS-CERT), ES-ISAC, Infragard, and SANS Internet Storm Center. Eversource also subscribes to a paid advisory service. All alerts are reviewed for applicability and analyzed for impact to the company. When mitigation is not available or cannot be implemented, the compensating measures are reviewed for mitigation effectiveness and to ensure the risk level is low. In these situations, the mitigations are reviewed with system owners. In addition, Eversource has multiple 3rd party forensic service providers that can be utilized if needed for a security event.

5.4 Vulnerability Assessment Process

Eversource performs 3rd party vulnerability assessments on an annual basis on selected systems based on risk and compliance requirements. All systems are considered for inclusion in the assessment based on risk profile, external factors, and the date the system was last reviewed. The Information security team also periodically scans the internal network for vulnerabilities and monitors remediation.

Eversource performs application vulnerability scans as part of the System Development Life Cycle (SDLC). The scan is performed during final application testing to ensure that no critical security vulnerabilities exist prior to deployment of the application. These scans also occur on major system changes.

6. Information Sharing and Communications

The objectives of the information sharing, and communications processes are to establish and maintain relationships with internal and external entities to collect and provide cybersecurity information, including threats and vulnerabilities, to reduce risks, and to increase operational resilience, commensurate with the risk to critical infrastructure and organizational objectives.

6.1 Cybersecurity Threat Information Sharing

Eversource participates in several information sharing communities and has defined processes for when to share threat information. The nature of the information largely determines the frequency with which it is shared. For example, emergent, urgent information with significant potential impact is shared immediately. However, CIS executive management (including the Board of Trustee) are periodically briefed on events and alerts during the year. That briefing includes examples of newsworthy cybersecurity items that were reviewed and either acted upon or documented as not needing action. It provides examples of risk assessment, reviews of any incidents, other current items of interest, and so on.

IT Security monitors multiple external threat advisory services such as ICS-CERT, ES-ISAC, Infragard, and SANS Internet Storm Center. Eversource also subscribes to several paid advisory services. All alerts are reviewed for applicability and analyzed for impact to the company. In addition to the advisory services, IT Security regularly networks with security personnel from other utilities.

Communication is a key role in the incident response process and IT Security also engages internal stakeholders as part of the process.

6.2 Information Protection Policy

Information sharing activities are guided by documented policies. Any information that has not been publicly disclosed is protected against improper disclosure, both inside and outside Eversource.

The Records and Information Management Policy governs how Confidential Information (CI) is defined. Types of such information include Confidential Business Information (CBI), Critical Infrastructure Information (CII), information related to Critical Infrastructure Protection (CIP), Critical Energy Infrastructure Information (CEII), Confidential Personal Information (CPI), and Protected Personal Information (PPI). The policy also defines protocols for the treatment of confidential information, Contractor and Third-Party Confidentiality Agreements, and Confidential Data Breach or Loss. 3rd Parties are required by contract to notify Eversource of a data breach. Additional guidance is provided in the Records Retention Schedule and in the Identification, Protection and Labeling of CEII Materials administrative procedure. Compliance to policies is audited periodically by the Internal Audit Department.

7. Event and Incident Response, Continuity of Operations

The objectives of the event and incident response and continuity of operations processes are to establish and maintain plans, procedures, and technologies to detect, analyze, and respond to cybersecurity events and to sustain operations throughout a cybersecurity event, commensurate with the risk to critical infrastructure and organizational objectives.

7.1 Data Breach Program

The Data Breach Readiness Program is a corporate-wide program with representatives from Legal, Corporate Communications, IT Security, and Business Segments as needed. The program includes a dedicated Incident Response Team (IRT) that is assembled upon notification of an incident to the IT Security Team and where the potential of a breach exists. Notification to appropriate IRT members is based on an established IT Incident Response Process including paging and notification. Additionally, Eversource uses a *Personal Information Data Breach Incident Response Manual*, which is reviewed and updated as necessary. This manual includes a policy statement, response team assembly, overview of Cyber Incident structure and process, roles and responsibilities, high-level communications workflow, customer communications, media and investor relations, and legislator and regulator communications protocols.

Data breach plan provides guidance for the management of a significant breach or loss of confidential personal information (Data Breach Incident) requiring notification to impacted persons (customers or employees), potential notification to and involvement of law enforcement and/or other governmental authorities, and communications with regulators and investors. That manual is focused primarily on communications and references other Data Breach Incident response procedures and materials, such as IT Incident Response Procedures, and business unit activities, which are part of the comprehensive plan for timely management and response to a Data Breach Incident. Communications regarding a Data Breach Incident are managed to comply with laws and to mitigate the negative impact on the relationship between the information owner and the company entrusted with it.

8. Supply Chain and External Dependencies Management

The objectives of the supply chain and external dependencies management processes are to establish and maintain controls to manage the cybersecurity risks associated with services and assets that are dependent upon external entities, commensurate with the risk to critical infrastructure and organizational objectives.

8.1 Procurement Security Controls

A comprehensive process is used for evaluating risks and helping ensure that vendors do not pose undue risk to the company and its customers. This risk assessment starts with obtaining a Security Score from an independent third-party rating service that is based on the vendor's security controls information. Security scores will be obtained for new vendors providing critical parts or services, as part of the Vendor Certification process. Vendors must have acceptable scores or commit to remediating the identified risks to do business with Eversource. A standard RFP process is used when procuring technology-related solutions. This process requires vendors to respond to requirements related to security capabilities and functional security controls. The cybersecurity procurement language for energy delivery is included in the RFP where possible. Vendors must respond to questions about the technology and demonstrate recognition of NIST ICS security guidelines as well as adherence to NIST security checklist configurations. They must provide baseline security configurations for their products with the ability to enable more advanced security configurations as documented with certifications of appropriate assurance levels of Common Criteria Evaluation. See *Section 2.1, Overall Enterprise Risk Management Program*. Cybersecurity procurement language is included in all contracts, based on what was included in the RFP.

Vendor selection criteria are implemented through four components. The application of these four components as a group for vendor/device selection supports the implementation of enterprise security compliance, policies, and standards as a base capability, and any relevant and specific cybersecurity standards and requirements.

8.2 Network Security Perimeter and Access Control

Network security supports the "Defense in Depth" strategy by implementing an external security perimeter, multiple internet facing zones for isolating different traffic types, and internal network segmentation. Internal segmentation separates "High Value" zones from the standard corporate network which is used by Eversource employees. The network segmentation strategy will be flexible to allow for changes in risk and a need to segment different business areas.

For vendor equipment or networks not directly under company control, vendors are required to maintain a supervised, secure, controlled, monitored network facility to ensure:

- There are various administrative, technical, and logical controls to ensure that data is secure while resident at the external vendor's network or in transit.
- Industry standard security solutions are deployed to secure data.
- Encryption of data, when appropriate, while resident at vendor's location or while in transit using industry standard encryption and cryptographic methodologies.
- Technology infrastructure that guarantees the availability of information technology assets.
- Access to information technology assets is allowed only by authorized individuals.
- Integrity and privacy of information technology assets is maintained.
- Misuse or loss of information technology assets is prevented.
- Transit of data to/from customer premises is sufficiently secured to guarantee integrity of the data while in transit.

8.3 Vendor Security Program Evaluation

A vendor security review that includes information technology security policies, procedures, and other documents is maintained jointly by CIS and Corporate Security (physical) and is performed periodically. This program requires that vendors perform the following activities:

- Review what is required of them at least annually and make appropriate updates after any significant changes to their business operations, computing, or telecommunications environment.
- Conduct their own information technology security policy review and standards compliance audit at least once every year. That review/audit must be performed by a qualified party or parties, independent of the vendor's information technology organization. The nature and scope of the audit is commensurate with the extent of the vendor's dependence on secure information technology assets to accomplish its critical business functions or as such operations can impact the security of other federal or state organizations.
- Upon completion of the audit, the vendor must enact the recommendations of the audit and the plan for correcting the deficiencies appropriately and provide documented results for review and evidence for final validation.

These measures ensure that vendor selection is made with careful consideration to, and mitigation of, cyber security risks that could potentially be introduced as a result of the proposed vendor relationship and project implementation. Thus, this part of the vendor selection process serves as a key component of the overall approach to cybersecurity. Information Security will also consider all forms of intelligence information as part of the vendor selection process.

In any contract where data is stored off-site, vendors are required to adhere to the IT Security Requirement document. That document is made part of the terms and conditions of any ensuing contract. The vendor is required to complete and return an IT Due Diligence Questionnaire. The information collected on that questionnaire is then processed through the CISRAQ process, with vendor submission evaluations used by IT, Security, the requesting department, and Purchasing to render decisions on the viability of proposals.

Annually, a risk assessment will be performed to identify hardware and service providers that by nature of the products used and services performed, will have the greatest risk to Eversource Operations systems (Relays, transformers, Engineering services, etc.). For the vendors identified through this risk assessment, additional security evaluation will be performed to reasonably ensure products are received in proper form, software is free of malware, and service providers have appropriate controls to prevent unauthorized access to Eversource systems and networks.

9. Workforce Management

The objectives of the workforce management processes are to establish and maintain plans, procedures, technologies, and controls to create a culture of cybersecurity and to ensure the ongoing suitability and competence of personnel, commensurate with the risk to critical infrastructure and organizational objectives.

9.1 IT Security Organization

The IT Security Department is responsible for operating the cybersecurity program for the entire company and resides within the IT organization. This department's mission is to ensure the availability, integrity, and confidentiality of information and systems. They provide consulting services to application development and IT infrastructure teams on security controls enterprise-wide. They manage access for all network users and to selected applications. Additionally, they maintain and operate a variety of specialized security technology that provides protection from external and internal threats.

Job descriptions are provided covering job responsibilities and daily duties for all exempt and non-exempt positions within the IT organization. They cover minimum education and experience requirements for each position and for each level within a position.

In addition to in-house staff, Eversource relies on third-party providers to supply security professionals to perform specific security services.

Training is need-based for each employee, with training funds budgeted through individual development plans. Depending on the subject, availability, or cost, training can be computer or classroom-based and it can be hosted internally or externally. In addition, security staff is encouraged to achieve security certifications.

9.2 Awareness Program and Training

IT Security maintains an enterprise security awareness program that communicates various security measures through a Cyber and Physical Security webpage, the daily company newsletter, posters and email campaigns. Various security messages are sent out quarterly at minimum. Communication is also sent for high profile security news items that impact the company.

Policies and procedures are periodically reinforced through online computer based training and other awareness mechanisms such as posters, management briefings, direct e-mails, read and sign processes, and company newsletters. Newly hired employees are required to complete an online cybersecurity training program. In addition, other departments that are considered high risk such as Human Resources, Customer Service, and System Operations Centers conduct additional specialized cyber security training. Everyone in the IT organization is required to sign a confidentiality agreement annually. Ongoing awareness campaigns include posters, articles in Eversource newsletters, slogans (such as *Human Firewall* and so on), policy links and other occasional item-specific informational communications.

10. Cybersecurity Program Management

The objectives of the cybersecurity program management processes are to establish and maintain an enterprise cybersecurity program that provides governance, strategic planning, and sponsorship for the organization's cybersecurity activities in a manner that aligns cybersecurity objectives with the organization's strategic objectives and the risk to critical infrastructure.

10.1 Standards Based Security Program

Eversource's cybersecurity program uses existing experience with and knowledge of the CIP framework as the basis for relevant cybersecurity planning. The program also introduces other complementary approaches (for example, NIST 800-30, NIST 800-53, NIST 800-82, and so on) where applicable. These guidelines provide a well-defined and understood cybersecurity posture capable of addressing challenges and/or compromises related to the loss of integrity, availability, and confidentiality. IT Security personnel monitor emerging standards by participation in industry standard groups, and are fully committed to identifying, managing, and mitigating cyber security risks.

Annual goals are set for the year to improve the cybersecurity program. These goals help work towards the strategy to constantly improve the program by addressing gaps, meeting new compliance requirements, and implementing new security tools to meet emerging threats and risks.

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10.2 Cybersecurity Plan Updates

The cybersecurity plan is reviewed and updated on an annual basis to address new or changed vulnerabilities. A revised cybersecurity plan is published annually and after off-cycle changes.

11. RECORD OF CHANGES

Revision 1

Annual review and approval of the plan. No editorial changes made.

Revision 0

Revision 0 was developed in the Spring of 2015 as a collaborative effort led by IT and EP leadership team.

Attachment 1
Acronyms and Abbreviations

(Sheet 1 of 1)

AHP: All Hazards Plan – integrated incident management/response plans

BC: Business Continuity

BIA: Business Impact Analysis

CBT: Computer-Based Training

CIP: Critical Infrastructure Protection, NERC standard

CIS: Eversource Corporate Information Security department

CISRAQ: Corporate Information Security Risk Assessment Questionnaire

DHS: United States Department of Homeland Security

DR: Disaster Recovery (usually meaning IT Disaster Recovery)

ERM: Enterprise Risk Management

ESP: Electronic Security Perimeters

ICS: Industrial Control Systems (NIST)

IDS/IPS: Intrusion Detection / Prevention systems

ITSM: Information Technology Service Management system (help desk trouble ticket tracking, and so on)

IP: Internet Protocol

IT: Information Technology

NERC: North American Electric Reliability Corporation

NIST: National Institute of Standards and Technology

OT: Operational Technology

RFP: Request for Proposal

RPO: Recovery Point Objective

RTO: Recovery Time Objective

Attachment 2
Reference Documents

(Sheet 1 of 1)

These documents were used in creating standards, procedures, programs for cybersecurity

- NIST Special Publication (SP) 800-53 — Recommended Security Controls for Federal Information Systems and Organizations.
- NIST Special Publication (SP) 800-30 — Risk Management Guide for Information Technology Systems.
- NIST Special Publication (SP) 800-82 — Guide to Industrial Control Systems (ICS) Security.
- NISTIR 7628 – Guidelines for Smart Grid Cybersecurity
- DOE DataGuard Energy Data Privacy Program – Voluntary Code of Conduct, Final Concepts and Principles
- ISO 27002 — Information technology – Security techniques – Code of practice for information security management.
- IEEE 1686-2007, IEEE Standard for Substation Intelligent Electronic Devices (IEDs) Cyber Security Capabilities.
- Security Profile for Advanced Metering Infrastructure, v 1.0, Advanced Security Acceleration Project – Smart Grid, December 10, 2009.
- IEC 62351 1-8, Power System Control and Associated Communications - Data and Communication Security.
- NIST 800-92 - Guide to Computer Security Log Management – EVERSOURCE leverages this guide when the opportunity presents itself to select and implement a SEIM technology.
- Cybersecurity Capability Maturity Model (February 2014) http://energy.gov/sites/prod/files/2014/03/f13/C2M2-v1-1_cor.pdf (Note: This model was used as a means to organize cybersecurity attributes within the Eversource Cybersecurity Plan, including the objectives listed throughout the plan. The model focuses on the implementation and management of cybersecurity practices associated with the operation and use of information technology and operational technology assets and the environments in which they operate.)

EVERSOURCE

MA Electric AMI
Customer Engagement Plan

Table of Contents

1. EXECUTIVE SUMMARY

Eversource Energy ("Eversource" or the "Company") is pleased to provide this Customer Engagement Plan (the "Plan") as a component of its AMI Business Case analysis for the deployment of advanced metering infrastructure ("AMI" or "smart-meter" technology) filed herewith.

AMI provides several benefits and capabilities that allow customers to better understand and control their energy usage and bills. It also provides near real-time usage information that can be accessed via multiple channels, provides near real-time usage insight and enables Time-Varying Rate ("TVR") choices that can give customers more control over their energy bills.

The Plan demonstrates how AMI can improve the customer experience in several ways. Customer awareness of their energy usage will be available via multiple digital channels and in key areas, including billing, energy use and outages. The Company's Customer Service Representatives will also have near real-time information available to better answer customer inquiries about topics such as high bills. These are one of the most common types of calls the Company receives, and a topic that is typically a cause of concern for customers. AMI will position Eversource to enhance its efforts to provide superior customer service.

The Company proposes to guide and educate its customers about smart-meters and the benefits and capabilities they enable pursuant to the framework outlined by our MA AMI Implementation Plan. The phases of the Plan are:

1. **Awareness**
2. **Deployment**
3. **New Energy Insight and Ways to Save**
4. **Time-Varying Rates**

This approach will support customers in first understanding what the technology can provide, then explain how the change will happen, and finally how they may benefit by enrolling in new programs.

To develop our Plan, Eversource used research and information from our industry colleagues and peers who have successfully deployed AMI with new customer alerts and/or time-varying rates. With those insights, Eversource's Plan identifies and builds initial general customer awareness and evolves to support customer-specific understanding and ultimate engagement in key AMI-specific areas, including:

- Smart Meter accuracy

- Customer requests to opt-out of a smart meter
- Customer Usage Insight & Notifications
- Customer Bill Impacts

2. OVERVIEW

The Plan overview identifies key phases in the AMI deployment Plan period – from general awareness of AMI to customer-specific understanding of what to expect as their meter is exchanged, through enabling new energy usage insight, notifications and Time-Varying Rates ("TVR"). Customer communication across all channels will be utilized – broadly to all customers with general AMI information and targeted, customer-specific messages that may vary and will evolve.

PHASE:	Awareness	Deployment	Engagement	
What? *(Learning Objective)*	AMI Overview, Benefits and Plan	What to Expect as Your Meter is Exchanged	New Energy Insight and Ways to Save	Time-Varying Rates
When?	Following AMI Plan Approval	As AMI Meters begin to be Deployed	As New Insight & Alerts Enabled	As Time-Varying Rates Enabled
How? *(Mediums / Channels)*	- General Email - Bill inserts - Website - Social media - Press Releases - Community Partners - Customer Service Support	- Targeted Letter - Targeted Email - Website - Door Hanger - Customer Service Support	- Targeted Emails - Web Portal - Website - Bill Messages - Customer Service Support - Press releases - On-demand - Webinar	- Targeted Emails - Web Portal - Website - Bill Messages - Webinar - Community Partners - Customer Service Support

3. CUSTOMER AMI METER OPT-OUT

During the deployment phase, our customers will have the opportunity to decline the installation of an AMI meter.

The Company's Plan includes an opt-out plan for both the installation of the AMI meter as well as choosing not to participate in the new rate plans. If a customer chooses to opt out of a meter, the Company will connect with that customer to better understand their decision not to participate and address any lingering questions or concerns that they may have. This is also an opportunity for the Company to educate the customer on the many benefits of AMI meters including, but not limited to, Energy Efficiency, usage and outage notifications, and money-saving Time-Varying Rates.

Customers who still elect to opt-out of the smart meter will be provided information and education on the benefits as well as the option to have a meter installed or participate in the new rate structure at any time. If a customer does not choose to participate in the AMI installation, monthly meter-reading surcharges will be applied to their billing statements.

Prior to any charges taking effect, the Company will deploy multiple communications to customers including billing inserts, outbound calls, and billing notifications to further educate the customer to the many benefits of AMI as well as any resulting charges that may apply should they choose not to allow the AMI meter to be installed at their home or business.

4. CUSTOMER RESEARCH

Eversource maintains a robust Customer Experience program, the core of which is the Company's Voice of the Customer ("VOC") Team. We currently utilize the VOC Team in a wide variety of customer satisfaction research, including broad-based ongoing survey research, sentiment analysis, and on-demand ad-hoc research via the Company's online community, known as the Eversource Advisory Group. The data we receive from this analysis heavily influences our final communications plans and advertising campaigns on a wide variety of topics. As a result of their extensive experience, we plan to use this same approach in determining our customer messaging for AMI meters through all the phases of the Plan.

Prior to our first phase of the Plan, Customer Awareness, we will perform customer research to determine our customer baseline knowledge levels and their opinions towards AMI. This will help inform additional research but will also help us develop customer communications that are relevant and help drive adoption. It will also provide us with a baseline to compare later research against to ensure our methods of communications are effective.

This research will continue into the first phase. As we move through the Customer Awareness phase, we will continue to use our research capabilities to identify concerns our customers may

have about AMI deployment so that we can proactively address them. We will also test for communications with customers for clarity and tone. The results of this data will ensure that our communications for phases two and three are spot on.

Customer research will remain crucial post-deployment. Once we enter those phases, we will focus on adoption of the new tools that smart meter technology enables to allow customers to better understand their energy usage. User experience research and usage trend measurement will be heavily utilized.

The availability of Time-Varying Rates has the potential to prompt a wide range of customer behavioral changes, giving them more ability to manage usage and take steps to lower their monthly bills. Research in this phase will examine those behaviors and also identify reasons why behavior may not change among different types of customers.

Because the Company's VOC Team will be involved throughout the AMI project, customer satisfaction research will respond in an agile way to any shifting priorities and timelines. Without the need to rely on an outside vendor to manage and conduct customer experience research, customer research can be quickly modified to gather needed feedback, and results can be communicated quickly to project stakeholder and deployment teams.

The resources that are available to the Company in the area of customer experience research will enable customer satisfaction to be a primary factor in the development of the Plan, the deployment of smart meter technology, and the development and iteration of tools to best utilize the benefits of the new infrastructure.

5. CUSTOMER OUTREACH

Our customer outreach plan is extensive, beginning once the Plan is approved and continuing for years once AMI meter deployment has been completed. Ensuring that customers understand the benefits they will have with the new meters is a priority for this project.

5.1 Customer Awareness

The Plan begins by incorporating awareness and education on AMI meters into existing communications plans for customers, a clean energy future, grid modernization and energy efficiency. Since these topics are already priorities for Eversource, and the benefits of AMI meters affect and may enhance many of these topics, it will be a natural fit to begin to incorporate the topic of AMI meters into these communications.

Aside from incorporating AMI into customer communications, we will add a dedicated area on our website on smart meters as a customer education resource. This will be where customers will be directed to from any social media posts or other collateral that is created. Additionally, a

paid media digital campaign that links to the website will be launched, providing awareness of the coming meter changes and benefits with an ability to easily dig into the specifics if desired.

By communicating on this topic early, we will create transparency with our customers, familiarity and buy-in. It will also provide time to address any concerns that come up and adjust our communications as necessary. It will also not create significant additional costs for the project since it will be incorporated into existing communications.

5.2 Deployment

We understand that being told a new "smart" meter is being installed will generate a number of questions, and some concerns from a minority of our customers. This change in how customers relate to energy requires a commensurately thorough and enlightened approach to boost customer awareness of AMI and the benefits it can offer. Eversource is committed to improving the overall customer experience. The goal is to educate our customers about their energy consumption and how AMI enables them to personally control their own energy costs, as well as take advantage of a full scope of enhancements and benefits.

There are multiple customer benefits of the AMI meter deployment. These benefits include:

- The ability to manage and reduce energy usage through real-time or near real-time energy management notifications
- Improved storm response and outage notifications
- Potential savings from efficiencies in reducing usage in inactive accounts
- Avoiding energy theft (which will help control and stabilize rates that directly impact customers over time)

The next phase of our Plan moves from general customer understanding and education to a targeted approach. While we will continue to maintain information on AMI in general communication channels, we will also begin targeting communities that are scheduled to receive their new meters in 90, 60 and then 30-day time periods.

5.2.1 90-60-30-Day Implementation Protocol

Along with general media outreach, Eversource will promote awareness about planned AMI meter installations at each of the three 30-day intervals leading up to installation.

90 Days Prior	60 Days Prior	30 Days Prior
Community Engagement • Share AMI online • Meet with key stakeholders and community officials • Provide fact-sheets with key messaging • Engage with key businesses • Target customers with special circumstances • Mass Market outreach	Customer Awareness • Customer mailings • Welcome letters • Town meetings • Email, online communication • Continue talks with community partners	Customer Outreach • Customer mailing • Customer emails • Welcome brochure • Address media relations • Social media

5.2.2 90 Days Ahead

AMI/Stakeholder Education Group members will connect with community leaders wherever possible in face-to-face meetings. Eversource will work in partnership with elected officials, community leaders, and customers to address and build FAQs and ensure customers know what's in it for them and AMI benefits. Information will be available in English and Spanish to further ensure all customers easily have the information needed and readilyavailable to them.

Audience	Key Messaging	Channel	Material
Customers Elected Officials Community Leaders	• Intro to AMI Meters • Customer Benefits	• Website • Media Ads • Online • Printed Material	• Educational Campaign • Instructional Videos • Meetings

5.2.3 60 Days Ahead

Group members will organize and speak to community gatherings about how AMI meters could help them better understand the cost of the energy they use and, ultimately with the addition of Time-Varying Rates, save them money. Eversource will target customers who may have special situations or needs and therefore require a more personalized and targeted approach. Special consideration will be given to diverse groups, low-income customers and small commercial customers.

Audience	Key Messaging	Channel	Material
Residential Small Business Medium Business	• Deployment Phases • Customer Benefits	• Email • Direct Mail • Community Meetings	• FAQs • Welcome Brochure • Online Information

5.2.4 30 Days Ahead

Customers will receive a notification using the various channels indicated in the table below, with a timeframe they could expect an AMI to be installed at their residence. Eversource will focus on continuing to build awareness and remain transparent in its communications regarding AMI benefits. Education and outreach will be key in this time period to ensure our customers are ready for their upcoming meter change. The communication method will vary based on customer need and preference.

Audience	Key Messaging	Channel	Material
Deployment Area	• Deployment Phases • Deployment Timeline • Customer Benefits	• Email • Direct Mail • Community Meetings • Social Media • Ads • Press Releases	• FAQs • Welcome Brochure • Online Information • Fact Sheets • Introduction Letter

5.2.5 Day of AMI Meter Installation

On the day a customer's meter is scheduled to be changed to an AMI meter, a technician will knock on the customer's door to make contact. This is due to the brief (up to 60 seconds) power disruption the customer may experience. If contact is not made, the technician will continue with the meter change. Once work is finished, a doorhanger (in both English and Spanish) will be left that explains the work that was done, that a power disruption occurred, the benefits they will have with their new meter and where they can go for more information. More information will be available on our website for customers to reference.

5.3 New Energy Insights and Ways to Save

Once customers have their AMI meter installed, we will continue to educate and engage customers in energy management solutions, using more near-and-real time and granular data available with AMI. As previously noted, our engagement plan post deployment will focus on customer insight into their usage and actionable ways to save in key AMI-enabled areas, including:

- Detailed Customer Usage
- Detailed Usage Sharing with Third Parties
- Enhanced Web and Mobile App Customer Experience
- Customized High Bill Alerts
- Delivered Energy Insights
- Enhanced Outage Alerts

Similar to our outreach pre-deployment, the Company will leverage existing customer touch points such as bill inserts, bill messaging, and website messaging. We also will host community meetings, webinars, etc.

5.3.1 Detailed Usage Insight

Access to detailed billing data is expected to provide value to multiple different customer segments. Residential customers will benefit from targeted information on how different rates or programs will impact bills based on their specific usage patterns.

All customer segments have the potential to benefit from visibility of near real time usage data. In the same way people can glance at a gas gauge on their vehicle or the battery life of their smartphone, visibility to this data will enable customers to more quickly modify behavior and better manage their usage. Access to more timely and detailed usage information is expected to support improved insight and reduce customer surprises with high bills.

With access to this information, customer service representatives will also be able to provide more targeted recommendations to callers for participation in time-varying rates or energy efficiency or demand response programs.

5.3.2 Detailed Usage Sharing with Third Parties

Via the Eversource website, customers can access their data as well as applications that allow them to easily and securely share their usage data with third parties. AMI data will be made available via those existing methods and additional data sharing mechanisms that may be made available in future years. For example, customers may authorize their Competitive Electric Power Supplier (“CEPS”) or other service provider to access their monthly, daily, and interval data.

Approved CEPSs can download current customer usage, demand data, and interval data along with 12 months of historical information.

5.3.3 Enhanced Web and Mobile App Customer Experience

Eversource will leverage AMI to develop an enhanced digital experience via inbound channels, namely the Eversource website and mobile application, that will provide access to detailed energy usage data in a compelling, visual format. This will enable customers to interact with usage information to gain insights about their energy use and turn those insights into actions.

The digital customer experience will integrate customer usage data to generate information on usage behavior, patterns and trends and display this information in ways that customers can easily understand. Customers will have the ability to overlay additional data in graphical format, including weather, price and billing data. Through the utilization of load disaggregation analytics software, customers will be presented with insights that can help them understand usage pattern drivers to determine how their energy is being used and where savings may be realized. Functionality will be tailored to specific customer segments such as residential, small business, and large commercial and optimized for viewing on all devices (e.g., mobile phones, tablets).

These digital capabilities will provide increased transparency through near real-time data for customers, allowing the Company to deliver value-added programs and targeted messaging. For example, the Company identify customers experiencing high bills and offer them energy management suggestions and payment plans tailored for their specific segment.

The digital experience with AMI will also be able to opt-in to receive new near real-time alerts and notifications related to usage, billing and outage insight that their AMI meter provides.

5.3.4 Customized High Bill Alerts

Eversource will also allow customers the option to receive relevant energy insights and notifications based on detailed data out to customers via outbound channels, namely email, text, and mobile application notifications. Customers will be able to set thresholds to receive alerts when the amount of their bill for a defined period exceeds a certain amount. In addition, the Company can proactively set high-bill alert thresholds for customers based on their historical usage and allow customers the ability to opt out of such communications. For example, a customer can receive a high bill alert in the middle of their billing cycle if their usage is already at their monthly average or higher.

The primary benefit associated with high bill alerts is customer satisfaction in avoiding a surprise high bill after their billing period has ended. This functionality also allows the Company to proactively address customer billing issues in advance of the bill being sent to the customer. Additionally, the alerts can make customers aware of unusual consumption patterns typically caused by faulty or inefficient in-home heating/cooling systems or appliances. In cases where a

faulty or inefficient appliance is involved, the alert gives the Company a timely opportunity to offer an energy-efficient replacement solution.

5.3.5 Delivered Energy Insights

The Company's approach to delivering customer-specific energy usage insights via outbound communications is driven by usage data. Currently, the personalized usage insights that customers receive, such as year-over-year usage comparisons and seasonal usage summaries, are based on monthly usage data. The ability to further customize outbound communications is greatly enhanced with the more specific data that AMI provides. Being able to analyze customer usage at the hourly, daily, and weekly levels allows insights into energy usage that were previously unobservable, which provides the ability to message customers with recommendations that are most relevant to them. Additionally, receiving data on a more frequent basis allows these usage insights and associated recommendations to be delivered to customers in a more timely manner that will motivate them to take action.

5.3.6 Enhanced Outage Alerts

Integration of the existing Outage Management System ("OMS") with the new AMI Meter Data Management System ("MDMS") will enable the Company to provide accurate restoration status to customers by leveraging the ability to remotely ping and interrogate AMI meters. This capability is particularly valuable to customers that are required to evacuate (e.g., due to a hurricane) or are not at their property, to avoid any inconveniences from electric service outage during the storm event. Remote pinging capability also allows for accurate identification of nested outages (i.e., outages caused by more than one reason), allowing the Company to provide more accurate power restoration estimates and avoid an inaccurate restoration notification to customers impacted by this type of outage. A customer will only receive a restoration notification once the OMS confirms the customer's meter has responded to its ping with a power restored message. Industry research has proven the improved outage capabilities enabled by AMI lead to higher customer satisfaction.

5.4 Time-Varying Rates

Once all AMI meters have been deployed and the Customer Information System has developed the Time-Varying-Rates design determined, we will be building awareness and educating customers on Time-Varying Rates. We will accomplish this by using existing communications tools, such as customer emails, on-bill messaging and inserts, free social media, online videos, press releases and earned media, direct mail, print collateral, town halls, and paid social media campaigns. Based on our energy efficiency programs and our best knowledge of current costs, we would expect a customer acquisition cost of approximately $50/customer (assuming 10% customer acquisition) with increasing costs per customer to reach additional customers that the Company estimates would be approximately $75/customer at a 20% opt-in enrollment level.

We will be sure to communicate with customers based on their preferences, where applicable, and some communications will be targeted to specific customers, while others will be mass communications. It will also be possible to seamlessly work the topic of TVRs into other conversations, such as energy efficiency, grid modernization, and other top-priority topics for Eversource. As much as there will be communications that solely focus on TVRs, we will also be able to bring the conversation around TVRs into other communications as well.

Aside from incorporating the benefits of TVRs into customer communications, we will also add a dedicated area on our website as a customer education resource. This will be where customers will be directed to from any social media posts, paid social campaign or other collateral that is created.

Incorporating this topic as often as possible into our customer communications will be necessary in order to educate customers on the benefits of TVRs. Just like it was necessary to communicate on the benefits of AMI, we will need to follow the same plan with TVRs in order to create transparency, familiarity and buy-in.

6. CONCLUSION

Eversource is poised to diligently execute this Plan to ensure that our customer outreach and engagement are robust, and that understanding is achieved. This will ensure that all customer groups, segments and demographics represented in the Eversource service territory are fully engaged and aware of the AMI process and the opportunities AMI will provide for them. The Company's Plan will allow customers to have a controlling hand not only in their own electric usage, but a true ability to modify their energy costs due to tangible involvement in their consumption and the resulting benefits from the rates and programs that AMI meters provide.

Finally, Eversource's partnership with its existing community advocates and other stakeholders will further ensure that AMI educational materials are disseminated to all customers, and particular customer segments and groups, in a customized way that meets their needs. Communications will be delivered through several channels, including print materials, social media, web, digital, and public presentations.

The ongoing communication efforts will begin after Plan approval and will continue for many years after deployment commences. This Plan is a continuation of Eversource's commitment to providing customers with the best energy service and the most up-to-date, modern and customer-focused opportunities available.

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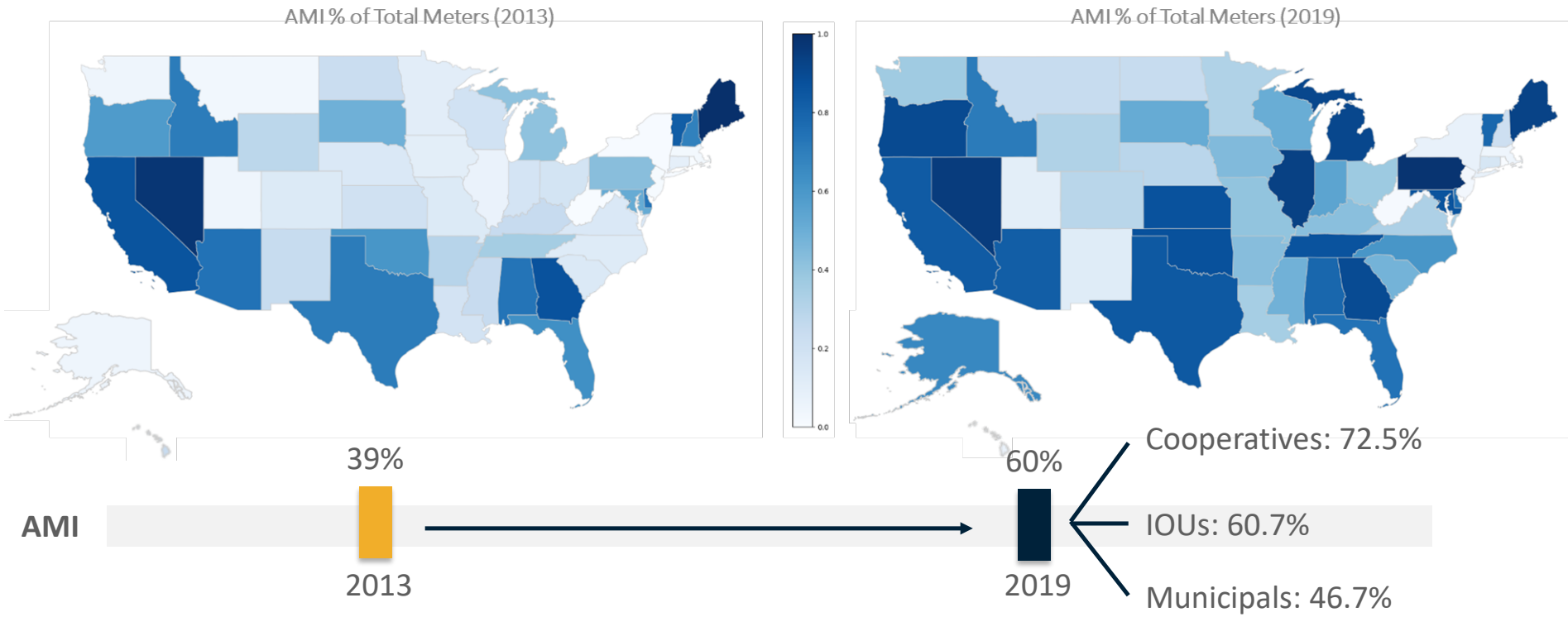
Massachusetts AMI Industry Assessment

July 2021

westMONROE

Draft & Confidential

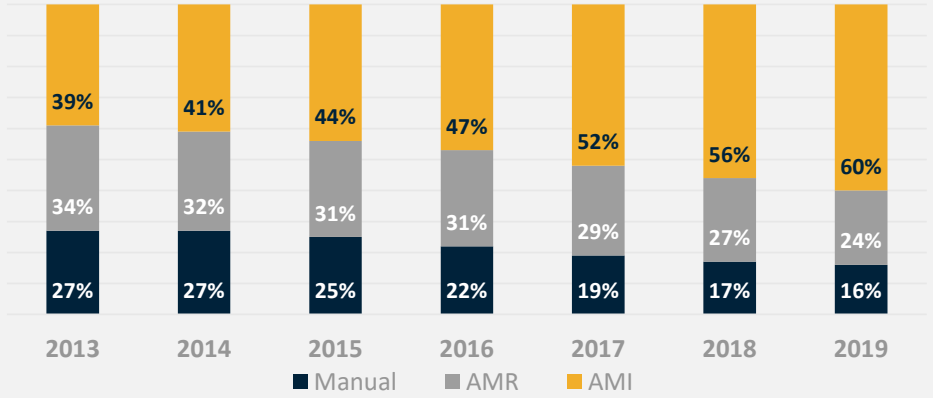
Since 2013, AMI has continued to grow as the leading metering technology for electric utilities across the country



While AMI has grown, AMR has declined from 34% to 24% and legacy/manual metering from 27% to 16% over the same time period

AMI investments are being aggressively pursued throughout the industry

U.S. Installed Meters by Type **Source: Data from Wood Mackenzie**



Installation of Electric Smart Meters has grown at a rapid pace since 2009. As of 2013, AMI has overtaken AMR in number of meters in the US

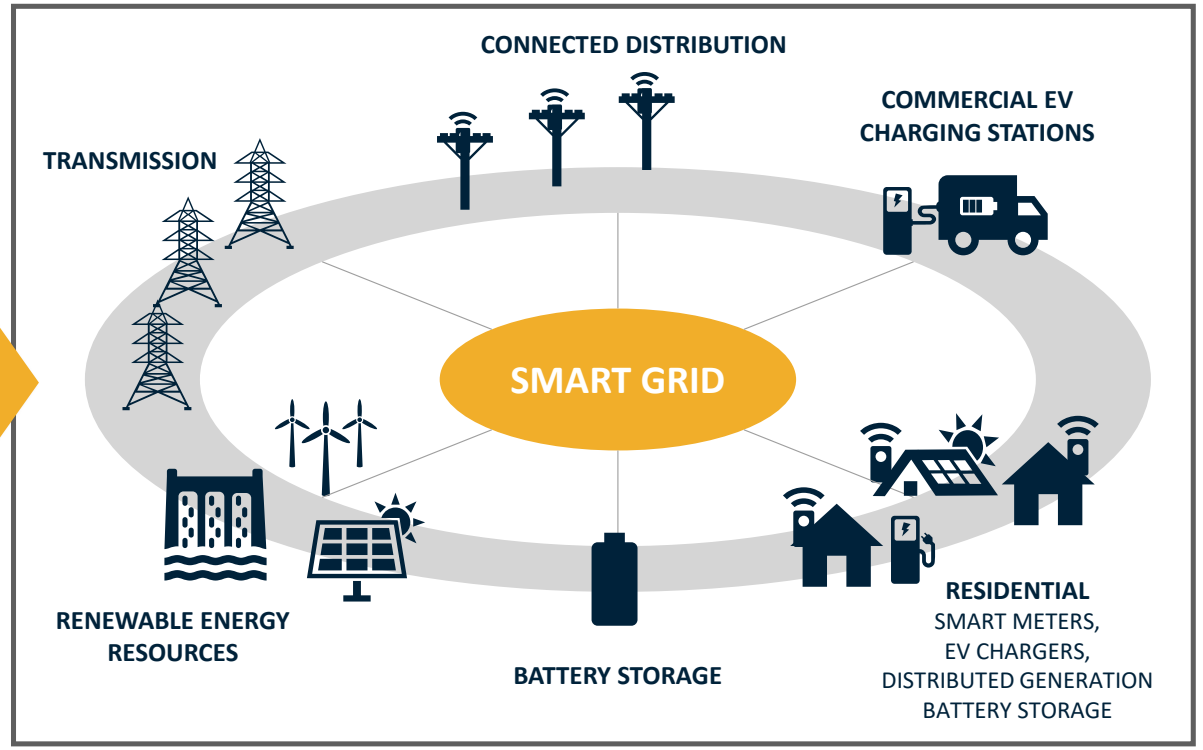
AMI Penetration by State **Source: Wood Mackenzie (2018)**

(EIA, 2019) "Annual Electric Power Industry Report, Form EIA-861 detailed data files" Data is population normalized.

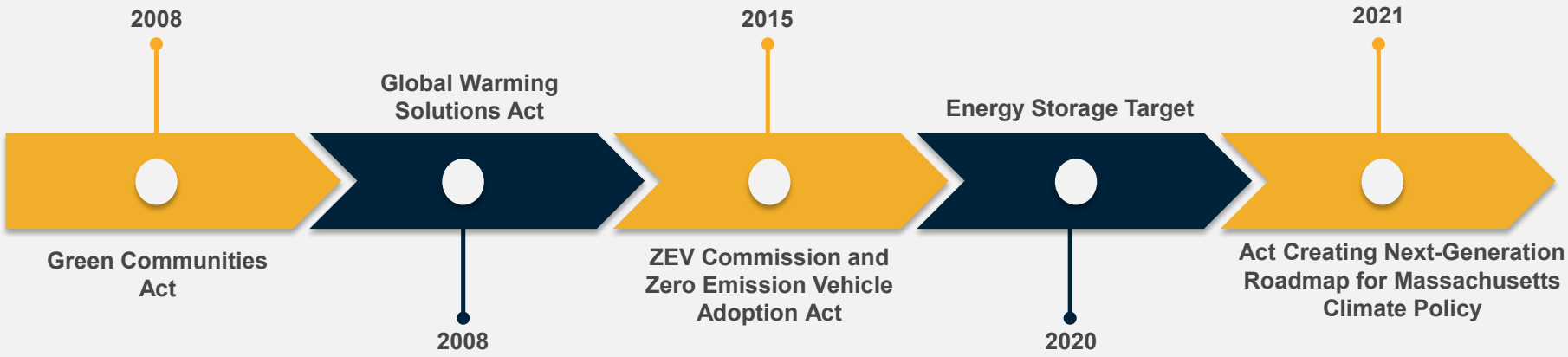
States are beginning to use the functionality to offer advanced rate and DR options. Eversource's AMI implementation benefits from industry lessons learned from both early adopters and recent deployments and considers a full suite of benefits to its customers

Developments in the industry are changing the current and future value of AMI

- Customer expectations are growing to include: more access to data, tailored rates and programs to lower energy use, and more clean energy solutions
- Growing adoption of EV, storage and other DERs is driving the need for more visibility at the grid edge
- The grid is growing more complex, requiring more tools and data to capture value across time and locations
- Growing opportunities to make investments in grid modernization technologies which will improve operation efficiency and reliability
- Metering and communications technologies have matured and can enable more value for customers and operations

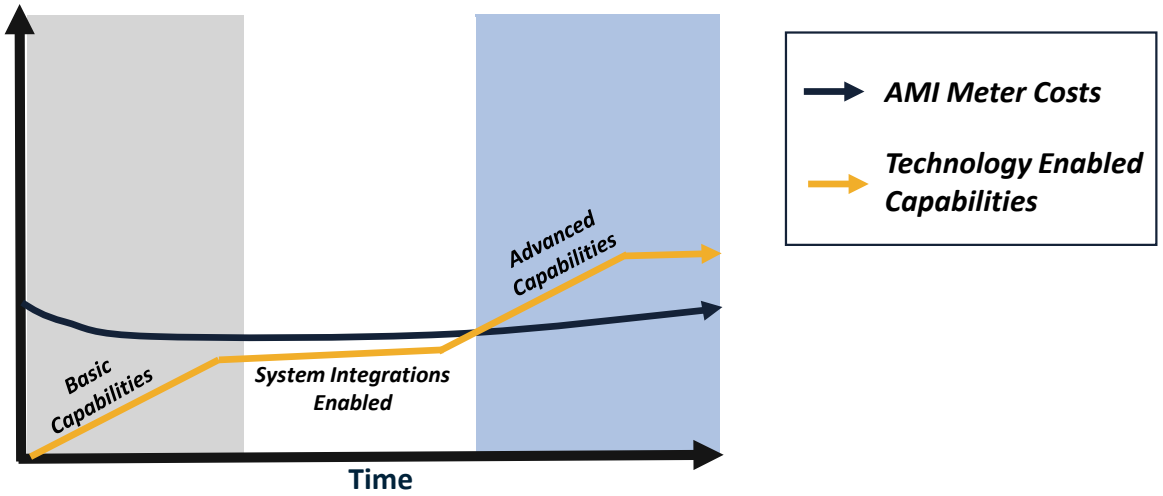


AMI is an important component for supporting Massachusetts state policies and goals for a cleaner, more efficient, and reliable electric grid, and to empower customers



AMI supports and enables the programs pursued by the state of Massachusetts by enabling programs like EE, DR, Time Varying rates and Electric Vehicle Adoption, and by increasing the efficiency of utility operations, leading to less unnecessary generation.

Over time, the AMI market has evolved with new technologies and associated outcomes while the cost per meter has not changed significantly



	Early Technology	Increasing Capabilities	Present and Emerging Opportunities
Capabilities	• Meters Enabling Hourly Usage Intervals • Telecom Network • Meter Data Management System	• Meters Supporting Faster Internals and Voltage Sensing • CIS System or Enhancements • OMS Integration • Omni-Channel Customer Experience	• Meters with Grid-edge Computation and Device to Device Communications
Outcomes	• Remote Meter Reading and Avoided Meter Reading Costs • Remote Connects/ Disconnects • Reduced Truck Rolls • Improved Theft Detection	• Usage Insights & High Bill Alerts • Advanced Rates • Outage Management • Conservation Voltage Reduction • Transformer Load Management	• Customer insights through IoT • Bolster DR/EE and EV participation • Other new business models • New Customer Programs

As new technology and capabilities for AMI have emerged, the technology has reached a level of maturity that is no longer a risky investment for utilities. Meters deployed now will most likely be able to continue enabling future use cases and benefits

AMI coupled with other investments can transform how customers participate on the grid

Today's Grid

Mechanical meters only allow for one manual read per month **limiting the options customers can receive**

Easy interconnect process and billing flexibility allows for customer installed renewables to flourish
Average US Solar installation costs have fallen 50% since 2010, leading to increasing residential adoption*

Intelligent grid devices improve reliability by enabling automated operations and dynamic outage response over a secure network
Ensuring grid reliability and security is critical as more intermittent generation comes online

Smart meters enable granular view of electric usage through portals and apps including proactive usage alerts
Customers are increasingly looking for more information about how to manage their energy use and expect easy accessibility and clear analysis

Smart meters allow interval reading through which customers can participate in advanced rate options; Proactive outage and restoration alerts, and transactive energy markets
Customers are transitioning to "prosumers", with higher levels of engagement and participation with their utility

EV rate options and charging infrastructure deployed through service area will increase EV adoption and make EVs more affordable for customers
MA is forecasted to have 480,000 EV on the road by 2030**

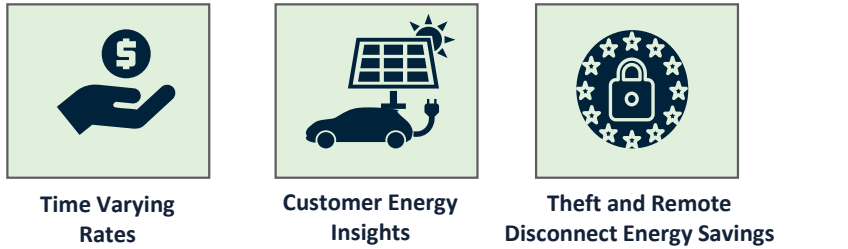
*SEIA Solar Industry Research Data
**ISO New England 2021 Transportation Electrification Forecast

Eversource will need to make investments in operational assets, systems, and processes to fully achieve the customer and operational benefits enabled by AMI

Investments

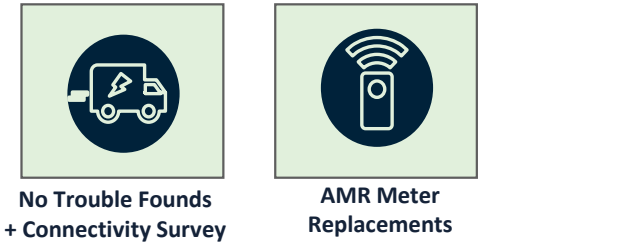
- AMI Electric Meters
- Communication Network
- Head-End and MDMS
- Customer Systems Replacement
- Customer Enablement Products & Services
- Analytics
- Operational System Integrations & Enhancements (OMS, Asset, Mgmt, VVO)
- Cybersecurity
- Customer Engagement & Education
- Project Management
- Contact Center + Theft

Customer Benefits



- Time Varying Rates
- Customer Energy Insights
- Theft and Remote Disconnect Energy Savings
- CVR/VVO & Voltage Sensor Savings
- Outage Restoration
- Asset Analytics
- Reduced Energy Carbon Emissions

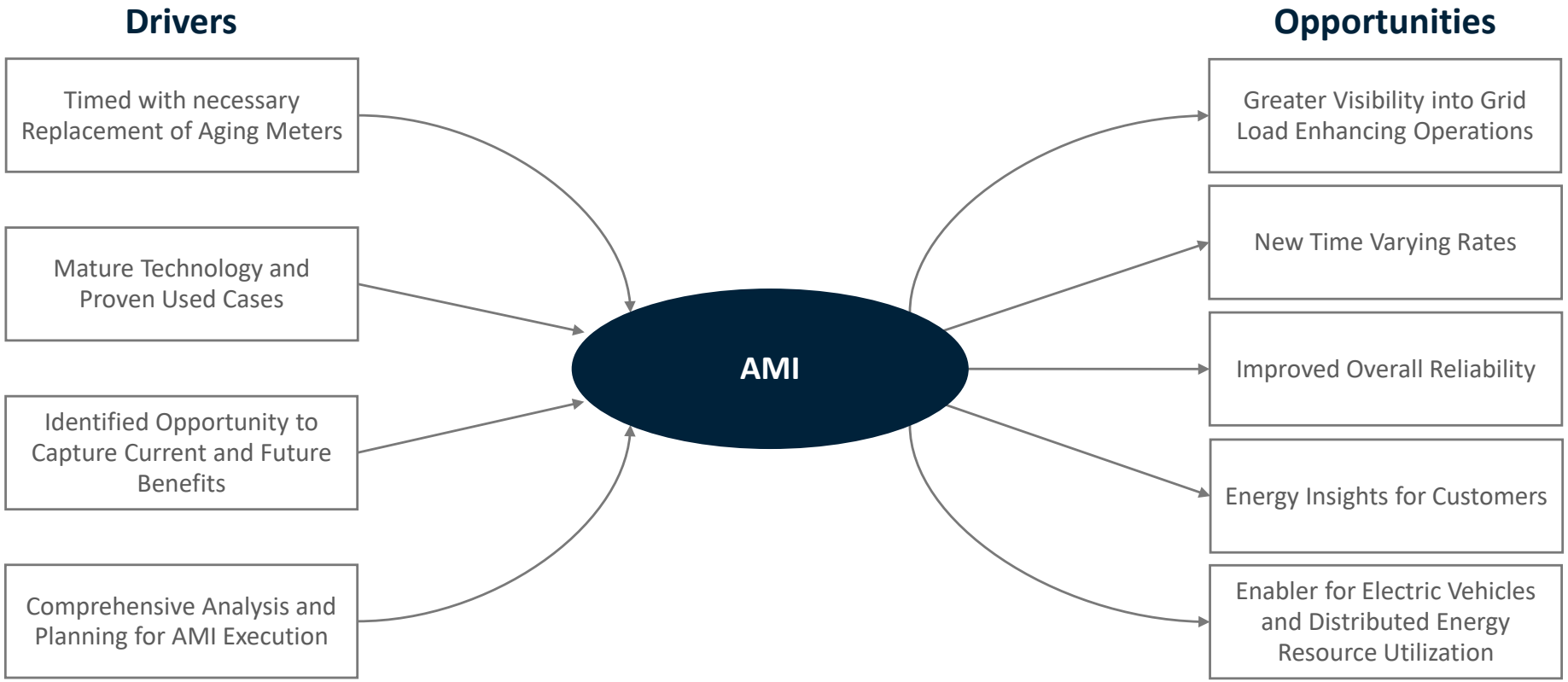
Operational Benefits



- No Trouble Founds + Connectivity Survey
- AMR Meter Replacements
- Bad Debt Reduction
- Metering & Billing System Benefits
- Meter Reading + Field Ops

Other Qualitative and Societal Benefits include more accurate load profiles, improved customer experience, societal economic and jobs benefits

Eversource is in an ideal spot to implement AMI and deliver additional value to its customers



Based on these industry trends and both customer and operational benefits, AMI is a valuable investment that will enable Eversource to best serve their customers

EVERSOURCE

Massachusetts AMI Business Case Analysis Summary Report

July 2021

Draft & Confidential

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westMONROE

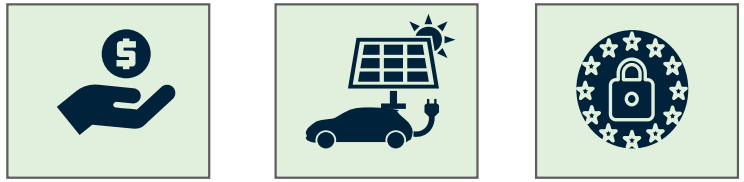
Business Case Overall Summary

Advanced Metering Infrastructure (AMI) represents a significant investment in operational assets, systems, and processes needed to fully achieve the benefits enabled through AMI

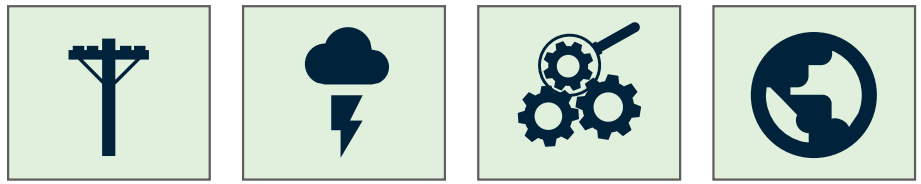
Investments

- AMI Electric Meters
- Communication Network
- Headend and MDMS
- Customer Systems Replacement
- Customer Enablement Products & Services
- Analytics
- Operational System Integrations & Enhancements (OMS, Asset, Mgmt, VVO)
- Cybersecurity
- Customer Engagement & Education
- Project Management
- Contact Center + Theft

Customer Benefits

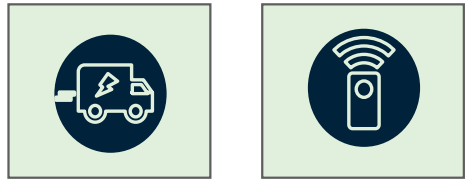


- Time Varying Rates
- Customer Energy Insights
- Theft and Remote Disconnect Energy Savings

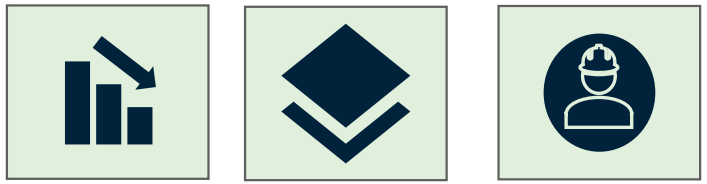


- CVR/VVO & Voltage Sensor Savings
- Outage Restoration
- Asset Analytics
- Reduced Energy Carbon Emissions

Operational Benefits



- No Trouble Founds + Connectivity Survey
- AMR Meter Replacements

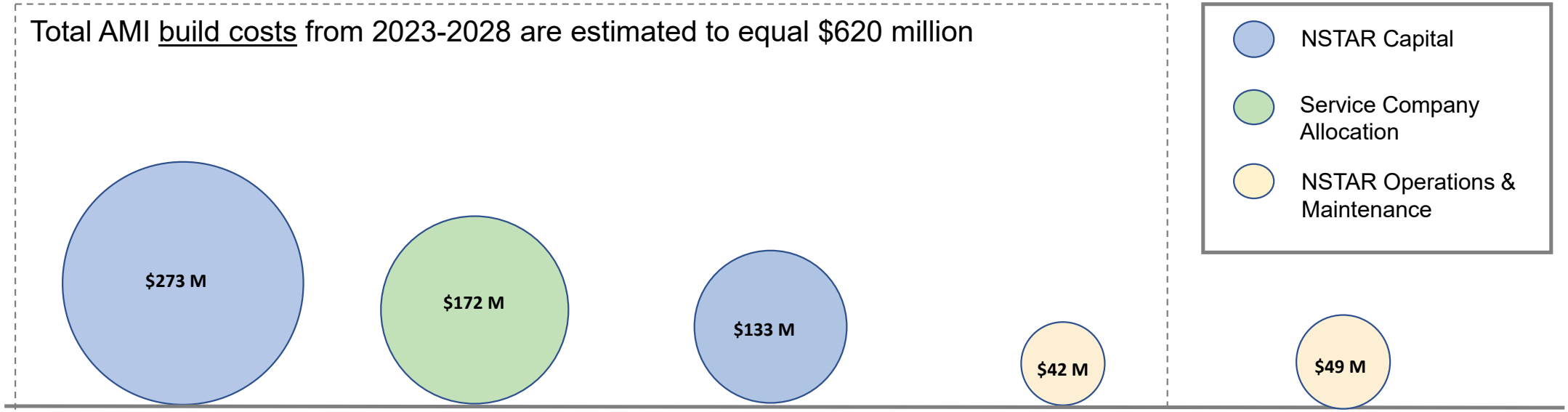


- Bad Debt Reduction
- Metering & Billing System Benefits
- Meter Reading + Field Ops

Other Qualitative and Societal Benefits include more accurate load profiles, improved customer experience, societal economic and jobs benefits

AMI program costs are concentrated in years 2023-2028 and are modeled through 2042

Total AMI build costs from 2023-2028 are estimated to equal $620 million



AMI Meters & Communications

- AMI Meters
- Mesh Network Equipment
- Backhaul

Service Company IT

- Customer System
- Meter Data Management System
- Headend System

Other Capital

- Analytics
- Cybersecurity
- OMS, VVO, Asset Mgmt Upgrade/Integration
- PMO/CMO
- Inc. CVR/VVO Equipment

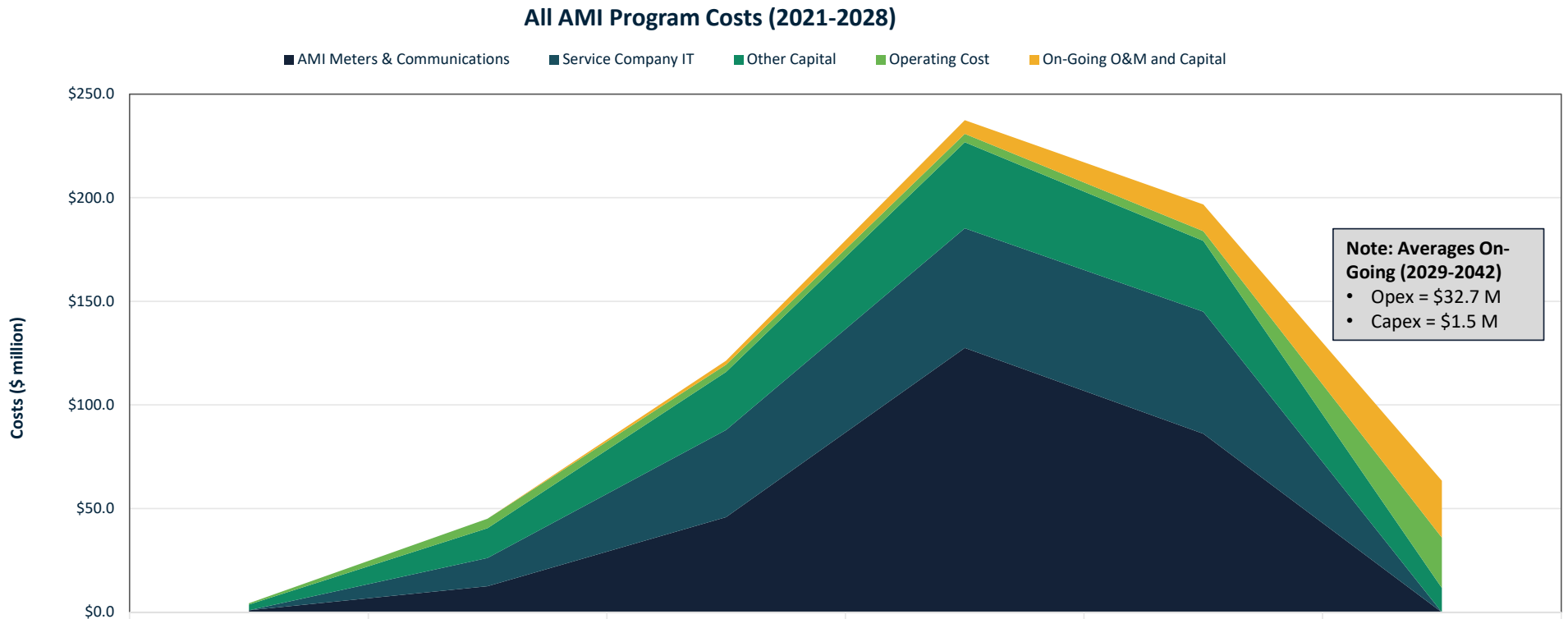
Program Operating Cost

- Contact Center
- Marketing
- Education
- PMO/CMO

On-Going Operating Cost

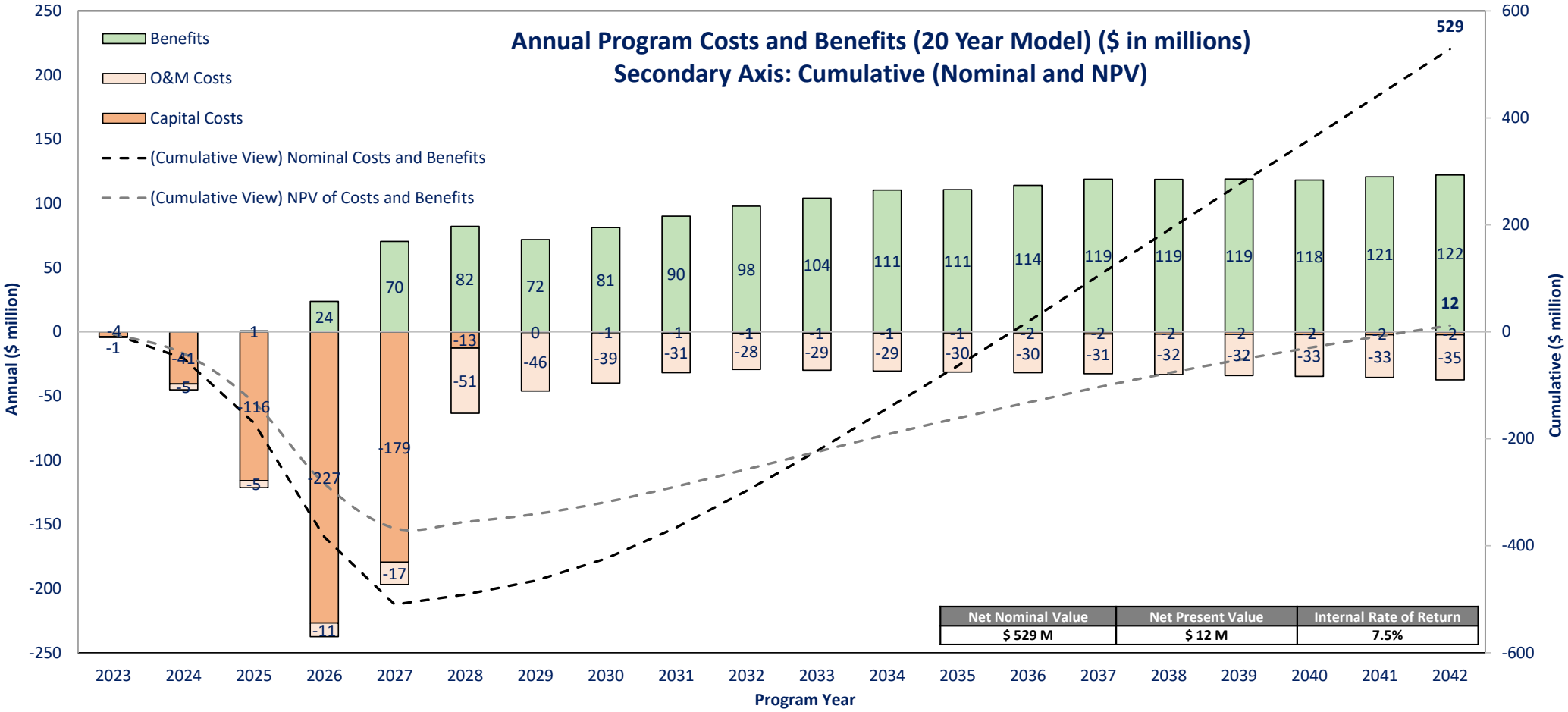
- Contact Center
- IT System & Integration Maintenance
- Incremental On-going Operational Resources
- Analytics
- Limited capital costs

Eversource MA AMI program costs are estimated to peak in the year 2026



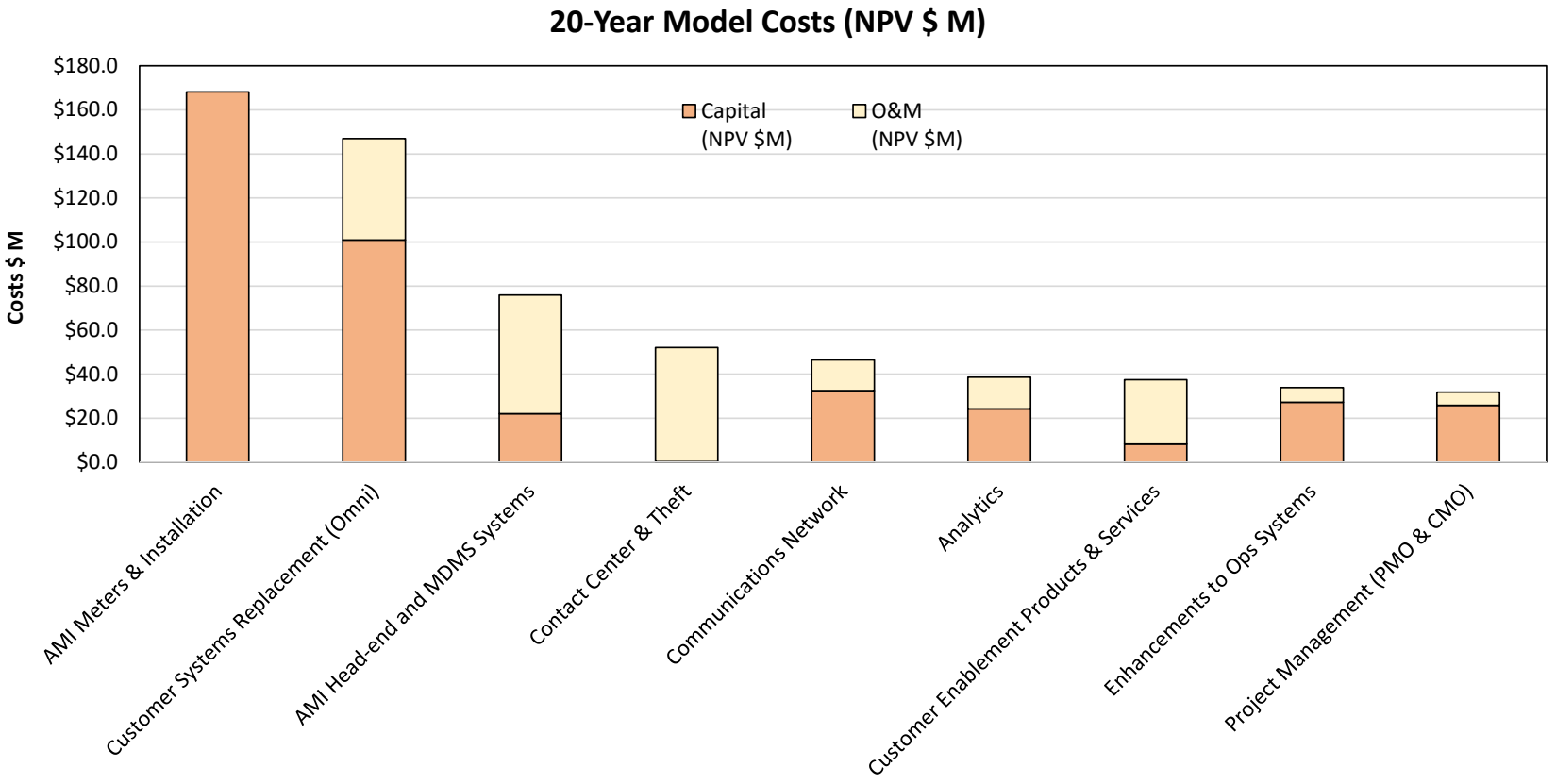
	2023	2024	2025	2026	2027	2028
On-Going O&M and Capital	$0.0	$0.0	$1.9	$6.6	$12.8	$27.5
Operating Cost	$0.6	$4.6	$3.6	$4.0	$4.7	$24.2
Other Capital	$2.8	$14.3	$28.0	$41.6	$34.2	$11.7
Service Company IT	$0.0	$13.7	$42.0	$57.7	$58.9	$0.0
AMI Meters & Communications	$0.9	$12.5	$45.9	$127.5	$86.1	$0.0

AMI benefits are estimated to exceed costs within the modeled timeframe



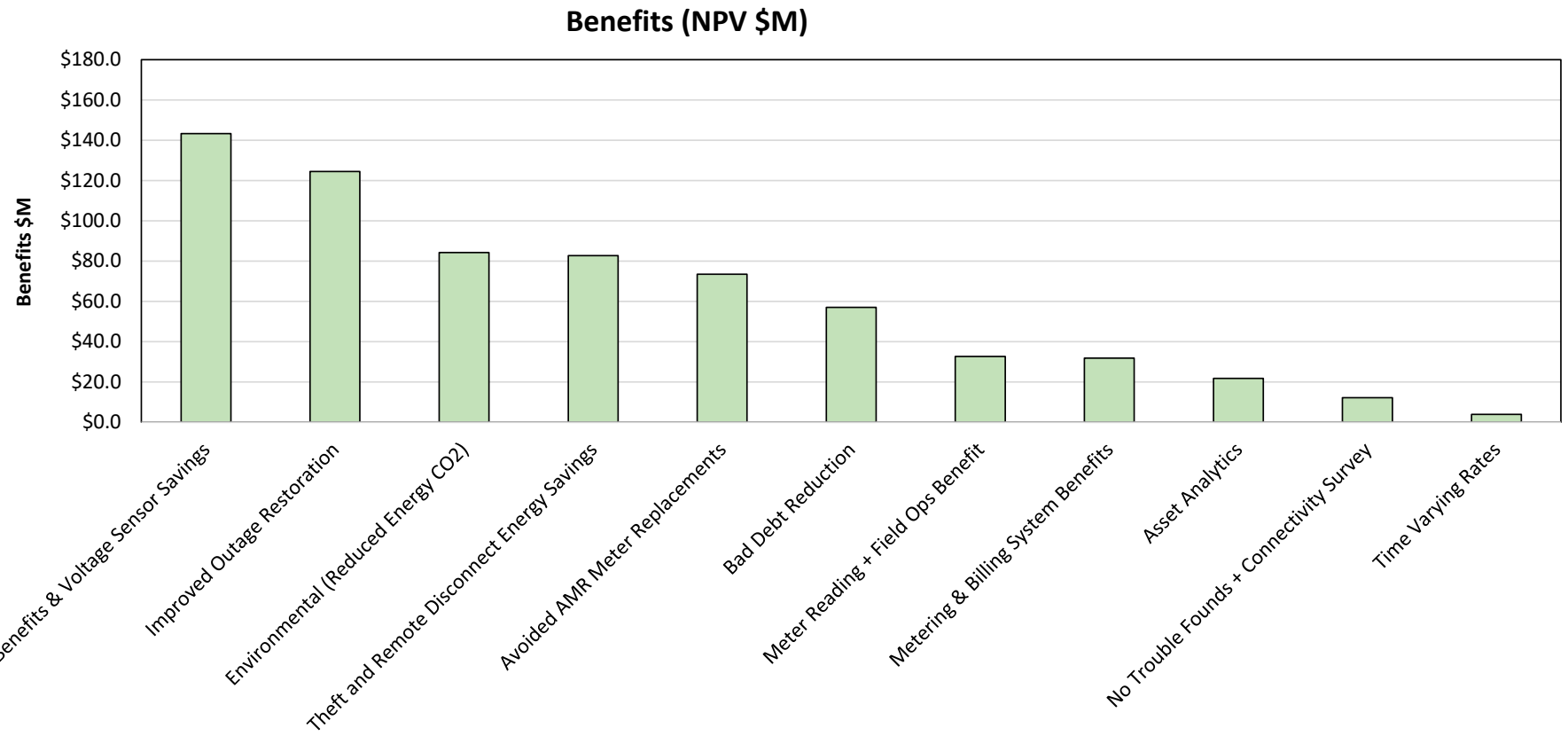
MA AMI 20 Year Cost Comparison

NPV Costs	NPV Benefits	Benefit to Cost Ratio
$ 655 M	$ 667 M	1.02

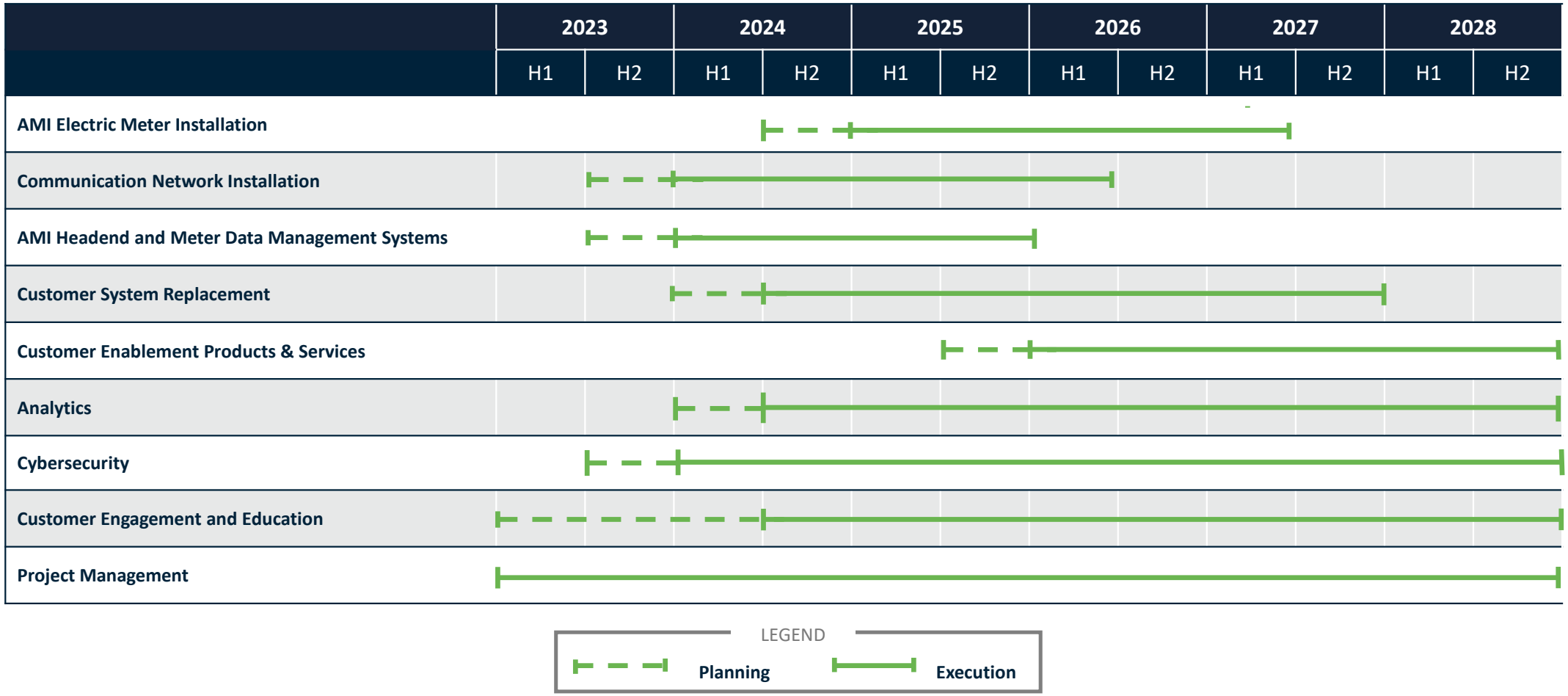


MA AMI 20 Year Benefit Comparison

NPV Costs	NPV Benefits	Benefit to Cost Ratio
$ 655 M	$ 667 M	1.02



The modeled AMI investment timeline is highlighted by several categories below



Cost Category Overviews

01 AMI Electric Meters

Description:

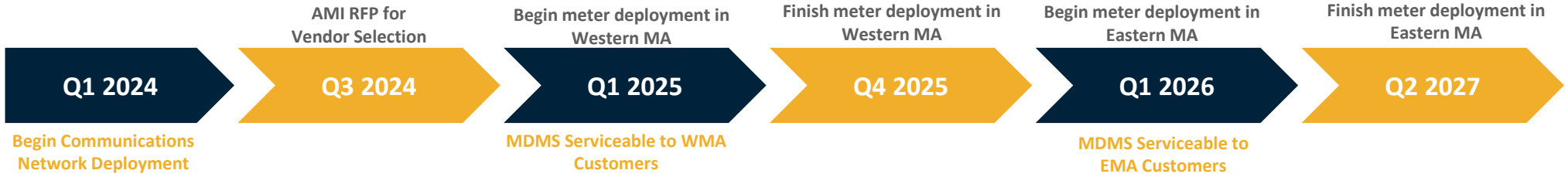
AMI Meters are the foundational investment needed to enable all associated use cases tied to AMI. It is also the largest cost component (including the install cost). The calculated cost includes replacement meters over a ~3-year deployment period. The detailed deployment schedule will be developed after coordinating with relevant internal and external stakeholder and advocacy groups. Eversource anticipates using a combination of internal and external crews to deploy ~1.2M meters over the three-year time frame, beginning in 2025 and concluding in 2027. An additional 262k AMI-ready bridge meters are expected to be able to be integrated into the AMI communications network. After deployment, therefore, a cumulative total of 1.43M meters will leverage the AMI Network. The AMI Deployment is dependent on the Communications Network, Headend and Meter Data Management System (MDMS) timelines. Planning will begin in 2024 and meter deployment in 2025.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Meters during Deployment	$158.67	$0.00	$158.67	64%
Meter Deployment Labor	$73.17	$0.00	$73.17	29%
On-Going Meter Replacement Capital	$8.86	$0.00	$8.86	4%
On-Going Meter Replacement Labor	$8.64	$0.00	$8.64	3%
Total	$249.35	$0.00	$249.35	100%

	2025	2026	2027
Cumulative Meters Deployed	~166k	~757k	~1.17M
Bridge Meters Migrated	~54k	~177k	~262k

Key Milestones:



Dependencies:

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$0.00	$32.80	$117.23	$81.92	$0.18	$0.27	$1.30	$249.35	$180.18
O&M	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total	$0.00	$0.00	$0.00	$0.00	$32.80	$117.23	$81.92	$0.18	$0.27	$1.30	$249.35	$180.18

02 Communication Network

Description:

The telecommunication network is the backbone and is also a foundational element needed to enable all AMI use cases. The network consists of end points on the meters that transmits the meter reads through a wireless network where the data is eventually received by the AMI Headend which decrypts the read and makes it ready for consumption by other systems (namely MDMS). The technology used can vary and a formal request for proposal process will be followed to selection a technology and vendor solution with a key consideration also related to solutions which can enable gas and/or water advanced metering infrastructure as a potential objective for Eversource in the future as well.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Network Fees	$0.43	$0.64	$1.07	1%
Manage, Design, Support, Testing	$23.72	$0.00	$23.72	29%
AMI IT/Tech Support/Eq. Repl. Labor	$5.37	$34.36	$39.73	49%
Physical Infrastructure, Installs & Replacement	$12.44	$0.00	$12.44	15%
Comms Tester Hardware, Other	$2.86	$1.15	$4.01	5%
Total	$44.81	$36.15	$80.96	100%

Key Milestones:

- **Q3 2023** — Communication Equipment RFP Vendor Selection
- **Q3 2023** — Procure Communications Infrastructure
- **Q1 2024** — Begin Communication Equipment Install & Standup AMI Ops and Technical Roles
- **Q1 2025** — Complete Communications Equipment Install
- **Q2 2026** — Complete Network Optimization and Support
- **Q2 2027**

Dependencies:

- Prepare AMI Headend & MDMS to be Serviceable to Customers as Meter Deployments Occur
- Meter Installations Begin in WMA
- Complete AMI Meter Deployment

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.89	$12.50	$13.09	$10.27	$4.46	$0.19	$0.20	$0.25	$44.81	$34.82
O&M	$0.00	$0.00	$0.00	$0.00	$0.05	$0.05	$0.09	$1.90	$1.96	$2.47	$36.15	$14.89
Total	$0.00	$0.00	$0.89	$12.50	$13.14	$10.32	$4.55	$2.09	$2.16	$2.72	$80.96	$49.70

03 Headend and Meter Data Management System (MDMS)

Description:

The communications network vendor is the typical provider of the Headend software as a service which functions as the hub of all meter data gathered from field devices which provides the pre-processing and security features need for data to retrieved by the utility's Meter Data Management System (MDMS). The MDMS serves as the data repository of all granular meter data. Its core functionality includes Validating, Estimating and Editing (VEE) meter reads before the reads are passed to the billing and other systems. The MDMS will perform some basic analytics and will be able to provide reports around theft/tamper detection. Usage data from the MDMS will then flow to other systems; such as the new Customer Information System (CIS) to enable Time Varying Rates and customer digital channels to provide usage insights and alerts to customers. The MDMS will also be connected to Eversource's data analytics platform to enable the target use cases made possible through AMI data. Across the Eversource enterprise, the MDMS selected should be able to serve multiple services and states.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
AMI System Integration, Configuration, Testing	$1.70	$0.00	$1.70	1%
AMI Annual Product support and SaaS	$0.00	$69.90	$69.90	45%
MDM O&M	$0.00	$55.79	$55.79	36%
MDM Configuration	$24.22	$0.00	$24.22	16%
Billing Budget	$0.00	$2.01	$2.01	1%
MDM Hardware + Other MDM	$1.31	$0.00	$1.31	1%
MDM Software	$0.90	$0.00	$0.90	1%
Total	$28.13	$127.70	$155.83	100%

Key Milestones:

Plan with selected Headend and MDMS vendors	Begin Western MA MDMS Install	Legacy WMA metering system transitioned to new MDMS	Begin Eastern MA MDMS Install	Legacy EMA metering system transition to new MDMS	Network Optimization and Support
Q3 2023	Q1 2024	Q1 2025	Q1 2025	Q1 2026	Q2 2027
		WMA Meter Deployment Begins	EMA Meter Deployment Begins		Complete AMI Meter Deployment

Dependencies:

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$13.70	$14.08	$0.35	$0.00	$0.00	$0.00	$0.00	$28.13	$23.66
O&M	$0.00	$0.00	$0.00	$0.00	$1.70	$5.13	$6.64	$6.74	$6.85	$7.74	$127.70	$57.72
Total	$0.00	$0.00	$0.00	$13.70	$15.78	$5.48	$6.64	$6.74	$6.85	$7.74	$155.83	$81.38

04 Customer System Replacement

Description:

The customer system replacement is an enterprise target to enable Time Varying Rates and other advanced customer facing options. The current customer billing systems are not capable of billing time varying rates at the scale required to support an AMI deployment and would therefore be replaced in coordination with the AMI deployment. The new customer information system will also offer additional non-AMI related benefits such as streamlined billing, fewer exceptions, and faster error and issue resolution. With the latest customer information system functionality coupled with the data and investments outlined in the AMI program, Eversource will be able to enhance customer offerings and better equip call center representatives with information on customer bills (particularly around high bills and usage), meter status, and outages while also increasing customer access to data in order to improve overall customer satisfaction.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
CIS Configuration	$125.19	$2.46	$127.65	49%
CIS O&M	$0.00	$97.69	$97.69	38%
Billing Budget	$0.00	$15.80	$15.80	6%
CIS Software	$9.52	$0.00	$9.52	4%
CIS Hardware + Other	$9.52	$0.00	$9.52	4%
Total	$144.23	$115.95	$260.18	100%

Key Milestones:

- Q3 2023
- Q1 2024 — CIS Software/SI Vendor Planning; Begin MDMS System Install
- Q3 2024 — Purchase CIS Software/Platform and Begin Deployment
- Q1 2025
- Q1 2026 — Complete MDMS System Install
- Q4 2027 — Complete CIS Deployment

Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$0.00	$27.97	$57.38	$58.88	$0.00	$0.00	$0.00	$144.23	$108.08
O&M	$0.00	$0.00	$0.00	$2.46	$0.00	$0.00	$0.00	$7.67	$6.26	$7.66	$115.95	$49.33
Total	$0.00	$0.00	$0.00	$2.46	$27.97	$57.38	$58.88	$7.67	$6.26	$7.66	$260.18	$157.41

05 Customer Enablement Products & Services

Description:

AMI implementation will enable new customer tools, usage insights & alerts, and EE/DR program information. Many digital channels will need updates to reflect changes due to AMI. The insights and choices will be available across several channels (such as web, mobile, social etc.). Additionally, the AMI data will enable 3rd Parties and competitive suppliers to leverage AMI data for value added services. This initiative will configure a standardized solution to allow 3rd parties and competitive suppliers to receive data access through a configured API while also enabling the continuation of existing supplier services. New usage and high bill alerts will be enabled through the mobile and web-based channels. Enabling digital features will require the AMI installation to be complete in addition to data brought together from the new MDMS and CIS solutions leveraging Eversource developed analytics and vendor solutions to maximize insights shared to customers.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Develop Delivered Energy Insights & Alerts	$0.44	$0.00	$0.44	1%
Web/App Development Visuals & Alerts	$4.22	$0.00	$4.22	5%
Creation of Data Sharing Solution	$7.76	$0.00	$7.76	9%
Incremental Resources for Alert and Insights	$0.00	$5.50	$5.50	6%
All Other Customer Enablement Service O&M	$0.00	$68.51	$68.51	79%
Total	$12.43	$74.01	$86.43	100%

Key Milestones:

Costs Occurring Across Years

Creation of Data Sharing Solution

Vendor Solution for Delivered Energy Insights & Alerts

Web/App Configuration & Display of Insights & Alerts

Sustained Customer Products & Services

Q1 2024 — Begin MDMS System Install

Q3 2024 — Begin CIS Implementation

Q1 2026 — Completed MDMS System Install

Q2 2027 — Meters Fully Deployed

Q1 2028 — CIS Implementation Complete

2029

Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$0.00	$0.00	$4.07	$4.14	$4.21	$0.00	$0.00	$12.43	$8.82
O&M	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1.52	$3.06	$4.64	$4.98	$74.01	$31.27
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$4.07	$5.66	$7.27	$4.64	$4.98	$86.43	$40.09

06 Analytics

Description:

With the abundance of data, Eversource will have the ability to perform descriptive and predictive analytics to enhance internal decision making and provide customers with additional insights and alerts. This initiative covers the development effort by Eversource's internal analytics Center of Enablement (CoE) to develop Power BI based reporting and machine learning solutions for a target set of use cases. Eversource intends to use systems currently in place along with the integration of additional data sources (such as the MDMS) to enable these analytics. The cost estimates assumes an incremental build to ensure gathered data fields are sufficient for future use case needs when an integration to the data analytics platform occurs. Data will be drawn from new AMI program systems and existing systems currently utilized at Eversource. Annual data costs are developed estimating monthly data requirements with data gathering frequency requirements to estimate the costs of architecture and ongoing annual hardware/software.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Development Period Hardware/Software	$1.50	$0.00	$1.50	2%
Hardware/Software On-Going Costs	$0.00	$22.88	$22.88	33%
Development Labor	$32.91	$0.00	$32.91	47%
Ongoing Labor	$0.00	$12.79	$12.79	18%
Total	$34.41	$35.67	$70.08	100%

Key Milestones:

While timing is generally aligned to source data availability, analytics will be a journey of continuous improvement

Q2 2024	Q1 2025	Q1 2026	Q1 2027	Q4 2027	Q1 2028
Plan for use cases & analytics architecture	Theft Analytics	Asset & Voltage Analytics	Outage Management Analytics	CVR/VVO Analytics	Rate Design & Energy Insight Analytics
	Meter Installations Begin	Complete MDMS System Install	OMS Enhancements & Integrations	Complete AMI Meter Deployment	CIS Data Available

Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$2.77	$7.47	$9.44	$10.64	$4.09	$0.00	$0.00	$34.41	$25.91
O&M	$0.00	$0.00	$0.00	$0.00	$0.08	$0.53	$0.98	$1.62	$2.17	$2.33	$35.67	$15.40
Total	$0.00	$0.00	$0.00	$2.77	$7.55	$9.96	$11.62	$5.71	$2.17	$2.33	$70.08	$41.31

07 Operational System Integrations & Enhancements

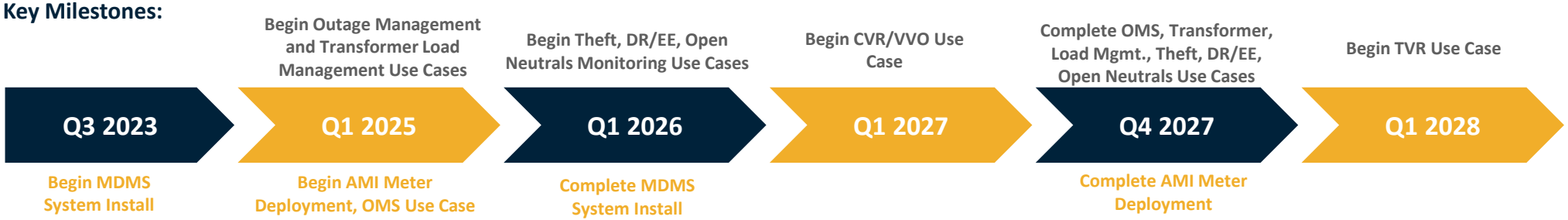
Description:

Enhancements to Eversource's Outage Management System (OMS) are needed to enhance system reliability and resiliency through AMI modules that can be enabled in the current vendor solution. The Analytics CoE will also develop some operational reports to enhance outage prediction and restoration. These outcomes will also enable more accurate reporting and notification of outages and estimated time of response communication to customers, thereby increasing customer satisfaction as well. The enhancements also include an integration between the Volt-Var Optimization System with the AMI Headend for sensor data leveraging the AMI network. As a related enhancement, additional load management equipment will be needed to take advantage of the AMI voltage insights down the feeder to complement existing Conservation Voltage Reduction (CVR) and Volt-Var Optimization (VVO) designs. Lastly, costs for the asset management of new set of AMI meters and communications assets are included in this category summary as well.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
VVO System Integration Software	$0.44	$0.00	$0.44	1%
VVO System Integration Labor and O&M	$2.34	$2.52	$4.87	9%
Load Management / Cap Bank Costs	$26.88	$0.00	$26.88	49%
Asset Management Software	$1.62	$0.00	$1.62	3%
Asset Management Labor and O&M	$1.70	$9.31	$11.01	20%
AMI to OMS Integration Software	$0.88	$0.00	$0.88	2%
AMI to OMS Integration Labor and O&M	$4.44	$5.05	$9.49	17%
Total	$38.30	$16.88	$55.18	100%

Key Milestones:



Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$0.00	$10.46	$17.33	$10.52	$0.00	$0.00	$0.00	$38.30	$29.12
O&M	$0.00	$0.00	$0.00	$0.00	$0.00	$0.14	$0.69	$0.86	$0.89	$1.10	$16.88	$7.20
Total	$0.00	$0.00	$0.00	$0.00	$10.46	$17.47	$11.21	$0.86	$0.89	$1.10	$55.18	$36.33

08 Cybersecurity

Description:

Cybersecurity is also a foundational aspect of the AMI program ensuring standards for systems and integrations. With the prevalence of granular usage data and added access points on the network, it becomes critical that Eversource takes appropriate actions to enhance system and grid security through "Defense in Depth". Added layers of security will ensure that customer data is kept secure. Measures to enhance Confidentiality, Integrity and Availability of data are also part of this scope. The bulk of Cybersecurity costs will incur during the deployment of the AMI meters and network and will occur also through the development of operational and customer-oriented analytics use cases. Ongoing support will be needed for key management and monitoring and controlling Cybersecurity for the AMI Network.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Added On-Going Labor	$0.00	$15.60	$15.60	49%
Deployment Labor	$9.55	$0.00	$9.55	30%
Key Management Expense	$0.00	$3.91	$3.91	12%
Cybersecurity Hardware	$1.68	$0.00	$1.68	5%
Physical Security	$1.16	$0.00	$1.16	4%
Total	$12.39	$19.50	$31.89	100%

Key Milestones:

- **Q1 2023** — Hire Cybersecurity IT Resources
- **Q3 2023** — Begin MDMS System Install
- **Q1 2024** — Purchase Cybersecurity Hardware and Key Management Software
- **Q1 2025** — AMI Deployment and Warehousing Physical Security — Begin AMI Meter Deployment
- **Q1 2026** — Monitoring of Use Case & Data Sharing Requirements — Complete MDMS System Install
- **Q1 2028** — Ongoing Key Management and Cybersecurity Operations — Complete AMI Meter Deployment

Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.32	$3.95	$2.22	$2.67	$2.71	$0.52	$0.00	$0.00	$12.39	$9.84
O&M	$0.00	$0.00	$0.00	$0.02	$0.07	$0.11	$0.15	$1.03	$1.10	$1.31	$19.50	$8.19
Total	$0.00	$0.00	$0.32	$3.97	$2.29	$2.78	$2.86	$1.56	$1.10	$1.31	$31.89	$18.03

09 Customer Engagement and Education

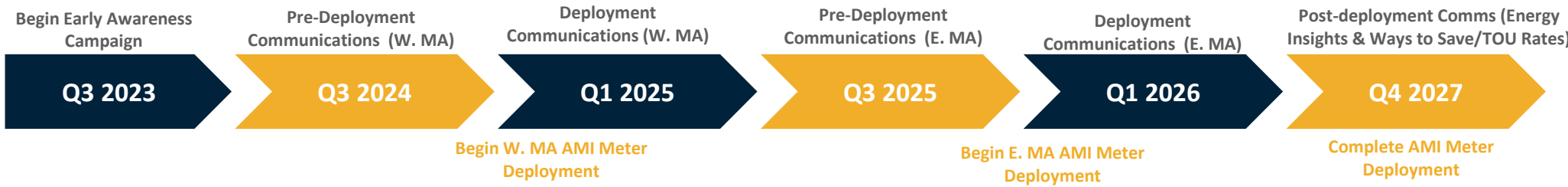
Description:

This initiative involves educating and informing customers on the benefits that AMI enables in addition to answering common questions that customers may have regarding the AMI technology. The initiative will involve multiple channels (such as door hangers, community events, social media etc.) to educate the customer on changes coming, how those changes will help them save on their electric bill and what to expect as their meters are being swapped out. These efforts will proactively address common concerns related to data privacy and health concern myths pertaining to AMI radio frequencies. With Eversource the campaign will last beyond the AMI deployment and continue as customers will need to be informed about the new displays of usage insights and alerts in addition to the benefits of participating in new time varying rates opportunities.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Early Awareness	$0.00	$0.10	$0.10	1%
Deployment Outreach	$0.00	$2.99	$2.99	26%
Energy Insights and Ways to Save Outreach	$0.00	$0.81	$0.81	7%
Time Varying Rates Outreach	$0.00	$7.47	$7.47	66%
Total	$0.00	$11.37	$11.37	100%

Key Milestones:



Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
O&M	$0.00	$0.00	$0.05	$0.37	$1.33	$1.26	$2.24	$2.02	$1.86	$0.17	$11.37	$7.76
Total	$0.00	$0.00	$0.05	$0.37	$1.33	$1.26	$2.24	$2.02	$1.86	$0.17	$11.37	$7.76

10 Project Management

Description:

This initiative includes Project Management Office (PMO) and Change Management Office (CMO) for the overall programs. As this is a transformational program for Eversource, dedicated resources and tools will be required for PMO and CMO. PMO will manage risks, ensure adherence to budget and timeline, monitor quality, report on progress, track benefits realization and control scope changes. CMO will ensure that leadership and employees are aligned with the overall program vision, manage resistance, perform employee training and coach and identify stakeholders across the organization. The team will be made up of both Eversource and contractor resources. Early efforts will be utilized to support RFP development for solutions, overall implementation planning, and will support the training/stand-up of new roles needed for on-going operations. Overall perspective on AMI program objectives will ensure disparate workstreams have coordination and dependencies are managed.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Project Management	$23.37	$0.00	$23.37	54%
Change Management / Training	$7.24	$6.68	$13.91	32%
QA/QC	$4.43	$0.00	$4.43	10%
RFP Development	$0.00	$1.41	$1.41	3%
Total	$35.03	$8.09	$43.12	100%

Key Milestones:

Q1 2023	Q2 2023	Q3 2023	Q1 2025	Q4 2027	Q4 2028
Stand up Internal PMO	Conduct Project Planning and Kick off for AMI project	Support Implementation Planning with ES & Vendors	Monitor and Control Project, Facilitate Organizational Change Management		Conduct Project Close and Shift to Operations

Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$2.46	$7.60	$7.83	$8.06	$6.23	$2.85	$0.00	$0.00	$35.03	$27.72
O&M	$0.00	$0.00	$0.57	$1.75	$1.81	$1.86	$1.44	$0.66	$0.00	$0.00	$8.09	$6.40
Total	$0.00	$0.00	$3.03	$9.36	$9.64	$9.93	$7.67	$3.51	$0.00	$0.00	$43.12	$34.12

11 Contact Center + Theft Costs

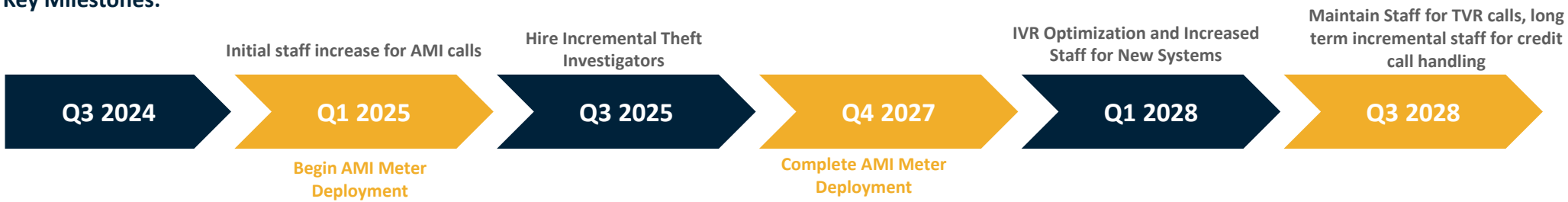
Description:

This initiative includes costs associated with impacts to the Contact Center for increased calls during the AMI implementation period, increased duration of calls following the new CIS implementation, and customer calls pertaining to the new energy insights and rate options. Furthermore, costs pertain to credit call handling as increases in notices and disconnects enabled through AMI related to non-pay take effect (smaller than the maximum that could be performed without the door knock requirement in Massachusetts). The cost of incremental notices is also reflected here. For the overall increase in call volume in a particular year, there is also a corresponding budget increase in telephony in addition to a one-time Interactive Voice Record (IVR) optimization cost. Also shown in this category is the cost of incremental resources for Theft investigation as leads are enhanced through AMI data and tamper alerts provided by the metes directly.

Investment Summary ($ in millions):

	Capital	O&M	Total Cost	% of Total
Contact Center (Non-Credit)	$0.00	$49.41	$49.41	48%
Credit Call Handling	$0.00	$27.02	$27.02	26%
Telephony	$0.50	$3.74	$4.24	4%
Theft	$0.00	$19.87	$19.87	19%
Disconnect Notices	$0.00	$1.82	$1.82	2%
Total	$0.50	$101.86	$102.36	100%

Key Milestones:



Dependencies

Cost and Timeline by Year ($ in millions):

* Represents Average Annual Amount from 2030-2042

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+*	20 Yr. Total	20 Yr. NPV
Capital	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50	$0.00	$0.00	$0.50	$0.33
O&M	$0.00	$0.00	$0.00	$0.00	$0.42	$1.57	$3.49	$25.27	$19.98	$3.93	$101.86	$55.43
Total	$0.00	$0.00	$0.00	$0.00	$0.42	$1.57	$3.49	$25.77	$19.98	$3.93	$102.36	$55.76

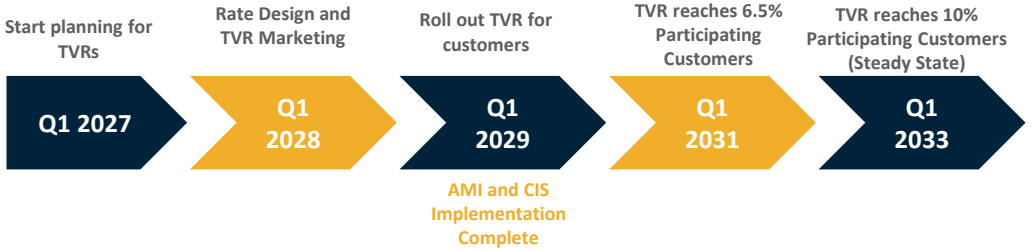
Benefit Category Overviews

Time Varying Rates

Description:

The interval data made available by AMI meters can be leveraged to expand customer choice by providing advanced rate options including Time Varying Rates ("TVRs") to customers. TVRs encourage customers to reduce or shift electricity use from high demand peak hours to lower demand off-peak hours and can result in savings on customer electric bills. The TVRs will be designed based on AMI data detailing actual customer use and load profiles, system constraints, and generation mixes. Different types of TVRs can be offered and targeted to different customer segments. Eversource will gather input from customers and other stakeholders, as well as findings at other utilities, to determine the desired rate types and structures to implement. The quantitative benefit of TVRs to customers is calculated based on expected customer adoption of TVRs and the expected reduction and shifting of load across those customers (based on previous pilots and industry benchmarks). For demand shifted, the estimated financial benefit is calculated by the average difference between on and off-peak energy prices using the estimated demand shift from the pilot and industry data. For the reduced demand benefit, the AESC 2021 capacity savings rate ($/kW) was used to calculate the savings. Sharing AMI data with 3rd parties will also enable 3rd party suppliers to offer TVRs to their customers, as well as provide data to other 3rd parties such as renewable energy suppliers for additional value-added services to customers.

Key Milestones



Dependencies

Calculation Approach:

Demand Reduction	Participating Customers (% of total)	X	Demand Reduction per Participant (kW)	X	Residential Peak Load (kW)	X	Demand Reduction Savings Rate ($/kW)
Energy Shift Benefit	Participating Customers (% of total)	X	Energy Shifted Per Participant (kWh)	X	On-Peak Demand (kW)	X	Energy Shift Savings Rate ($/kWh)

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Residential Demand Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.45	$6.69	$2.43
C&I Demand Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.20	$2.95	$1.07
Residential Energy Shift Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.02	$0.34	$0.12
C&I Demand Energy Shift Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.04	$0.62	$0.22
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.71	$10.59	$3.84

AMR Meter Replacements

Description:

The Company's current AMR meter technology and its supporting infrastructure are rapidly approaching the end of their useful life. Without a full AMI deployment, these AMR meters would be replaced with new AMR meters when they reach end of life. In the event of a full AMI deployment, end of life or AMR meters needing replacement (not including Bridge and TOU meters) coinciding with territory with communications infrastructure in place will be replaced with AMI meters. Following the deployment as well, the labor and capital associated with these avoided AMR replacements are captured as a benefit based on equipment reaching the end of its asset life. Offsetting a component of this benefit is the periodic replacement of AMI meters which are accounted for in the cost section of this analysis.

Key Milestones

Dependencies

Calculation Approach:

AMR Meter Replacement & Labor = [Total Number of Meters - # of Bridge & TOU Meters] X Weighted Avg AMR Meter and Labor ($/Meter) X AMR Meter Replacement Schedule (% Meters/year)

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

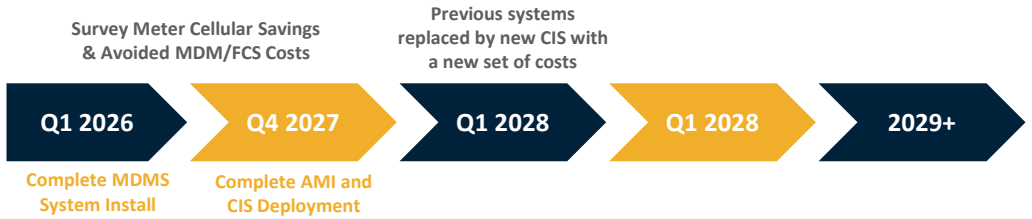
	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Internal Labor	$0.00	$0.00	$0.00	$0.00	$0.41	$4.58	$7.22	$5.47	$94.32	$45.10
Materials	$0.00	$0.00	$0.00	$0.00	$0.31	$3.34	$5.11	$3.25	$57.57	$28.38
Total	$0.00	$0.00	$0.00	$0.00	$0.72	$7.93	$12.33	$8.73	$151.90	$73.48

Metering & Billing System Benefits

Description:

A modern CIS is a critical to support the full range of AMI benefits including billing time varying rates and providing rate-based information to customers such as high bill alerts. The current CIS is not capable of billing time varying rates at the scale required to support an AMI deployment and would be replaced as part of the AMI deployment. The costs for the new CIS are included in the business case, but there are a number of billing and system costs, which support the current metering and billing systems, that will be reduced or eliminated when the new systems for metering and billing are in place. These include the O&M costs attributable to Massachusetts electric for maintaining the old system for electric meters and the costs for the AMR Field Collection System (FCS) equipment that was used to collect customer usage data for billing. The FCS and drive-by meter reading infrastructure for this system consists of vehicle-mounted collectors and the software to read, store, and process meter consumption data. Additionally shown here is the benefit of current survey meters leveraging a cellular network for data transmission which can instead leverage the AMI network when meter replacements occur throughout the territory in Massachusetts.

Key Milestones



Dependencies

Calculation Approach:

Avoided Systems Costs		MA Metering System Costs Attributed to Electric ($)	+	MA CIS/C2 System Costs Attributed to Electric ($)			
Survey Meter Cellular Cost ($)		Survey Meters (#)	x	Annual Survey Meter Cellular Costs ($)			
AMR FCS Equipment	[	FCS Equipment Annual O&M ($/Year)	+	FCS Equipment Annual Capital Budget ($/Year)	] x	Percent of Meters Deployed (%)	

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Avoided Systems Costs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.34	$0.35	$5.39	$81.52	$31.53
Survey Meter Cellular Cost ($)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.01	$0.02	$0.04	$0.61	$0.25
AMR FCS Equipment Costs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.01	$0.04	$0.06	$0.93	$0.38
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.36	$0.41	$5.49	$83.06	$32.16

Bad Debt Reduction

Description:

The Company's current AMR infrastructure requires a field technician to physically visit a customer premise to discontinue service, or to investigate potential instances of theft. When AMI is implemented, a visit will still be required per Massachusetts door-knock policy, but that visit is made more efficient using AMI as a physical disconnect on the meter will not be necessary. Once the customer has been notified, service can be remotely shut-off, enabling more efficiency in process and timing. Due to these efficiencies, more disconnects due to non-pay can be performed at a faster rate than previously. It is important to note that disconnects will not be performed for immediate non-payment and will align and enforce any regulatorily-mandated disconnect policies that are in effect. When combined with a robust customer education effort on the new automated process, the Company expects to increase the effectiveness of its collections process, lowering costs for all customers and minimizing the amount of debt that customers might accrue. The benefit for bad debt reduction is calculated based on the number of additional disconnects that can be performed with efficiencies multiplied by the average amount of bad debt accrued per disconnect. In addition to financial benefits, customers will experience qualitative benefit related to faster reconnect as the need for a service crews to schedule time to physically visit the customer premise will no longer be needed.

Key Milestones

Dependencies

Calculation Approach:

Reduction in uncollectable / bad debt	Bad Debt Benefit ($/Disconnect)	x	Incremental Disconnects (#)

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Reduction in Bad Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$1.28	$7.25	$8.03	$128.91	$57.04
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$1.28	$7.25	$8.03	$128.91	$57.04

Theft Benefit and Remote Disconnect Energy Savings

Description:

Energy theft is difficult to detect, requiring manual review of billing and meter-reading system reports to find discrepancies in energy consumption. AMI data allows detection of abnormal usage and theft faster and more accurately by providing almost immediate notification of meter tampering which then leads to an investigation. Additionally, a discrepancy between the sum of individual meter consumption and measured usage on the associated network meter provides real time indication of theft and can be spotted quickly for investigation. The benefit from theft is measured as a percentage of total revenue and is based on industry benchmarks for theft with a targeted percentage investigated through AMI and additional theft investigator resources. Related to remote disconnect energy savings, there are currently too many disconnect requests to be fully addressed in the field and energy continues to flow despite service being cancelled or moved. The AMI system with remote turn-on and turn-off capability will reduce these costs by enabling immediate remote shut off when service is cancelled. This energy is quantified at Eversource, and the benefit is estimated leveraging the basic service rate where customers overall would see a benefit. In addition to the financial benefits, the energy avoided also avoids the GHG emissions associated with generation of those kWh and improves customers experience by having shut-off and turn-ons happening almost immediately, rather than having to wait for a technician.

Key Milestones

Dependencies

Calculation Approach:

Reduced Theft Benefit	Percent of Identifiable Theft Reduced (%)	X	Estimate of Theft (% of Annual Revenue)	X	Annual Revenue ($/Year)
Remote Disconnect Energy Savings	Reduction of Non-Technical Losses (%)	x	Annual Non-Technical Loss (kWh/Year)	x	Basic Service Rate ($/kWh)

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Reduced Theft Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.94	$3.98	$6.09	$96.26	$39.73
Remote Disconnect Energy Savings	$0.00	$0.00	$0.00	$0.00	$0.00	$1.02	$4.31	$6.59	$104.17	$43.00
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$1.95	$8.29	$12.68	$200.43	$82.73

No Trouble Founds & Connectivity Survey

Description:

Currently, Eversource depends on customer calls to predict the location of damage on the system and initiate the restoration process. Based on these calls, a crew needs to be dispatched to investigate claims of an outage or power quality concern, as there is no ability to remotely determine service level. Most of these on-site investigations are ultimately resolved as "no trouble found" ("NTF"), meaning the issue was on the customer side of the meter rather than an outage. With an AMI system, operators can conduct remote diagnostics to confirm a reported outage or service issue. By confirming an outage remotely, AMI prevents unnecessary labor and truck rolls to address NTF calls, a benefit calculated through the number of NTF calls received per year and the average labor cost of those calls. An additional benefit of AMI, is that in the event of a NTF call from a customer, the operator has ready access to historical event flags, hourly usage data, and other metrics that provide actionable insights into what caused a confirmed outage and can pass this info along to the customer, enhancing satisfaction. Another benefit of AMI described here is connectivity through distributed intelligence which mitigates Eversource's need to conduct a Connectivity Survey once every ten years across the territory. With AMI meters providing connectivity insights, this survey will no longer be necessary and will improve reliability of connectivity models throughout the years of operation.

Key Milestones

Dependencies

Calculation Approach:

Reduced No Trouble Found Responses	Number of No Trouble Found (#/year)	X	Labor Rate to Respond & Vehicle Costs ($/hr)	X	Reduction in No Trouble Found (%)			
Connectivity Survey Costs	Rate of Survey	X [	Cost per Field Survey ($)	+	Miles Driven per Survey	] X	Expense per Mile Driven ($/mile)	

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Reduced No Trouble Found Responses	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.47	$0.88	$13.70	$5.42
Connectivity Survey Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.57	$1.10	$17.10	$6.73
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1.04	$1.98	$30.80	$12.15

Meter Reading and Field Ops Benefits

Description:

Currently most meter reading is preformed by drive-by AMR technology. AMI technology uses wireless telecommunications for the collection of meter data. Meter data can be collected as needed to support billing and a number of other customer and operational programs and benefits. The majority of Meter Reading work will be performed remotely after the AMI deployment, but a contingent of manual meter reading activities will remain to account for any new meter opt-outs. All automated meter reading work is estimated to be repurposed for disconnect work orders requiring door knocking, but the modeled base case scenario does allow for workforce attrition over the time frame of the model. Despite modeled workforce attrition, an incremental increase in disconnects for non-payment is possible due to the efficiencies enabled by AMI. Efficiencies per disconnect were estimated based on Eversource experience leveraging AMR to AMI Bridge meters for remote disconnects, and other automated services enabled more time per field service rep to be dedicated to disconnects. Avoided activities include elimination of reconnects, could-not-get-ins, and a reduction of non-credit orders such as soft closes. As an additional qualitative benefit, the AMI communications network also enables firmware upgrades over the air and a small number of line disconnects to be performed remotely.

Key Milestones

Remote AMI disconnects inclusive of a door knock are enabled as a function of meter deployments with automated metering reading and non-credit field orders transitioned to door knocks/disconnects

Dependencies

Calculation Approach:

Budget Savings	Average Loaded Salary ($/year)	X [	Baseline Staff (# FTE)	--	Staff through Attrition in Year 20]

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

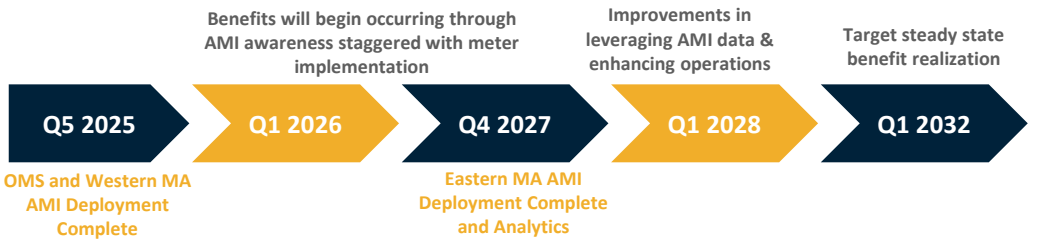
	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Meter Reading and Field Ops Budget Savings	$0.00	$0.00	$0.00	$0.00	$0.00	$0.07	$0.66	$6.17	$93.23	$32.23
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.07	$0.66	$6.17	$93.23	$32.23

Outage Restoration

Description:

Interruptions in electric power service pose significant inconvenience for residential, commercial and industrial customers. AMI is expected to reduce the duration of major outage events by supporting earlier identification of nested outages at the tail end of the restoration. Currently, the OMS uses algorithms to predict total number of customers out of power and the number of damage locations. With AMI, accurate, real-time data is provided throughout storm events, which makes restoration of power more efficient and targeted to highly impacted areas. Reduced outage tails will enable crews to be sent home faster yielding reduced costs. Additionally, outage response during minor storm and non-storm days (blue sky) will be made incrementally faster through the awareness provided by AMI, enabling field crews to be dispatched prior to customer calls reporting an outage. Customers for whom power is restored more quickly than it would have been without AMI will place a value on that benefit, and an estimate of that benefit was found using the Lawrence Berkley National Lab Interruption Cost Estimate ("ICE") calculator. These interruption costs were multiplied by the number of service interruption minutes per year and the estimated reduction that AMI could provide through more quickly identifying and triaging outages.

Key Milestones



Dependencies

Calculation Approach:

Major (Deferred) Storm Reduced Outage Response Costs	# Deferred Storms (#/year)	X	Outage Tail Reduction Estimate (%)	X	Cost of Response Labor, Vehicles, Expense ($/storm)
Deferred, Non-Deferred Storm and Blue-Sky Cost of Interruption Benefit	Outage minutes (minutes/year)	X	AMI reduction estimate (%)	X	Cost of outage ($/minute)

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

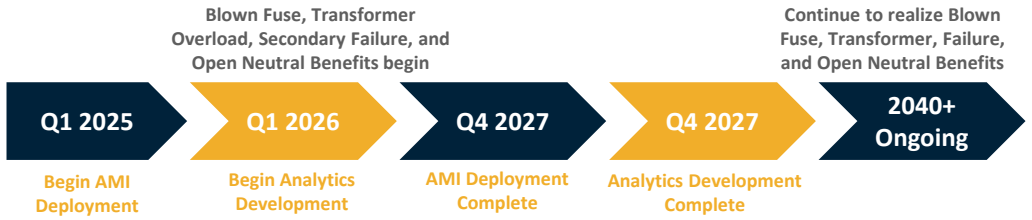
	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Major (Deferred) Storm Reduced Outage Response Costs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.57	$1.77	$13.98	$212.03	$79.13
Deferred, Non-Deferred Storm, and Blue-Sky Cost of Interruption Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.42	$1.26	$7.71	$117.39	$45.35
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.99	$3.03	$21.69	$329.41	$124.48

Asset Analytics (Blown Fuse, Transformer Overload, Secondary Failure, Open Neutral)

Description:

AMI enables asset analytics which benefits operations and customers. AMI benefits use cases pertaining to blown fuses, transformer overloads, secondary failures, and open neutrals as a few target use cases. Voltage data from AMI in addition to usage is a critical piece of information. For example, with Transformer Load Management, the TLM algorithm is used to predict transformers at risk for overload. With the growing penetration of behind-the-meter solar generation, among other factors, the historical TLM algorithm may not be indicative of future load patterns. Additional data enabled by AMI would serve to inform updated algorithms and more granular and area-specific analysis. By providing interval data at the customer premise level, AMI will provide more granular and accurate information about the timing and magnitude of individual customer peak loads than is otherwise available in addition to enabling voltage readings to be associated with pertinent assets on the feeder. The AMI data will enable Company to plan and design the system in response to increased EV adoption, including customer charging patterns, and assessing grid impacts of different chargers. Additionally, interval data can identify potential reverse flow overload conditions. Incorporating the information enabled by AMI into the asset management methodology will enable engineers to identify and failures, providing a financial benefit from reducing resources required to address overloads & failures while enhancing customer reliability, safety, and overall satisfaction.

Key Milestones



Dependencies

Calculation Approach:

Event Labor Savings	Average Annual Occurrences (#/year)	X	Events Mitigated Through AMI (%)	X	Replacement Labor Time (minutes)	X	Replacement Labor Rate ($/hour)
Event Damage Savings	Average Annual Transformer Overloads (#/year)	X	Overloads Mitigated Through AMI (%)	X	Cost of Failure Damages ($/Failure)		
Reliability Benefit	Average Annual Occurrences (#/year)	X	Events Mitigated Through AMI (%)	X	Customer Outage Hours (#/year)	X	Res. Reliability ($/min)

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

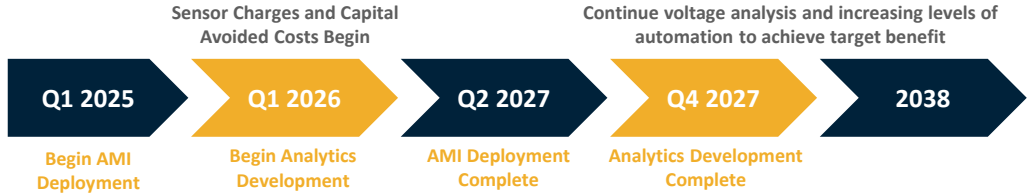
	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Labor Savings	$0.00	$0.00	$0.00	$0.00	$0.00	$0.08	$0.25	$1.96	$29.71	$11.08
Damage Savings	$0.00	$0.00	$0.00	$0.00	$0.00	$0.01	$0.17	$1.61	$24.35	$9.36
Reliability Benefit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.01	$0.04	$0.22	$3.28	$1.27
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.10	$0.45	$3.79	$57.34	$21.70

CVR/VVO & Voltage Sensor Savings

Description:

AMI data and associated analytics can help achieve energy reduction by providing insights for advanced voltage control and management (such as through CVR/VVO techniques) to adjust service voltage to customers and thus reducing line losses and energy consumption. With real-time sensing, communication and control of line regulators and capacitors, higher levels of savings can be realized while ensuring reliable, high-quality service to customers. While AMI does not provide the entire benefit, the integration of AMI into the existing CVR/VVO system reduces the number of line sensors that are required and boosts the visibility and savings that the VVO/CVR system can achieve. Settings for the transmission of voltage exceptions will minimize the level of raw data that will need to be processed, and Eversource will advance this use case for initial reports and control adjustments to greater levels of integration and automation. The CVR/VVO benefits from AMI are twofold. First, the additional energy and demand reduction beyond that of the existing CVR/VVO benefit. The value of this benefit is calculated using values from the 2021 AESC study for energy and demand savings. The energy reduction also has an associated environmental benefit, which is calculated in a different section. The second benefit is the reduction in line sensors and their associated cellular charges. These savings are calculated as an annual cost per sensor based on the estimated reduction in sensors. Qualitatively, insight into system voltage will enable Eversource to be prepared for changes in load driven by EVs and other distributed resources.

Key Milestones



Dependencies

Calculation Approach:

Energy Reduction through CVR/VVO	Energy Impact of AMI to CVR/VVO (%)	X	Retail Electric Sales Volume (kWh/year)	X	Energy Reduction Savings Rate ($/kWh)			
Demand Reduction through CVR/VVO	Demand Impact of AMI to CVR/VVO (%)	X	Peak System Demand (kW)	X	Demand Reduction Savings Rate ($/kW)			
Avoided Sensor Capital	Cost per VVO Line Sensor ($)	X	VVO Line Sensors Avoided (Sensors/Feeder)	X	Number of Feeders			
Avoided Sensor Cellular Charges	VVO Line Sensor Cellular Fee ($/meter/year)	X	Percent of Feeders with VVO (%)	X	Number of Feeders (#)	X	VVO Line Sensors per Feeder (no AMI)	

Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Energy Reduction through Conservation Voltage Reduction (CVR) ($)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$14.82	$222.32	$73.55
Demand Reduction through Conservation Voltage Reduction (CVR) ($)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1.83	$27.46	$9.09
Avoided Sensor Cellular Charges	$0.00	$0.00	$0.00	$0.00	$0.00	$0.40	$1.69	$2.58	$40.74	$16.82
Avoided Sensor Capital	$0.00	$0.00	$0.00	$0.00	$0.00	$10.35	$33.55	$1.55	$67.11	$43.89
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$10.75	$35.24	$20.78	$357.64	$143.34

Reduced Energy Carbon Emissions

Description:

Carbon dioxide reduction is the principal environmental benefit tied to the deployment of AMI. The reduction in carbon dioxide is directly linked to several of the highlighted benefits in earlier sections of this business plan. AMI reduces the amount of CO2 that is emitted through generation due to the reduction in energy use through the target CVR/VVO and Remote Disconnect "Soft-Close" energy reduction benefits, specifically. For every kilowatt-hour reduced, there is a societal benefit for the associated carbon that is avoided which can be quantified. Enhanced VVO is expected to lower overall energy consumption within the service territory, and soft-close related energy will be avoided through the remote disconnect process. Additional non-quantified benefits include reduced emissions from fewer truck rolls for meter reading and No-Trouble Found responses and the benefit of reduced NOx and SOx emitted through generation and truck rolls. The benefit was calculated leveraging the 2021 AESC Non-Embedded GHG Cost factor.

Key Milestones

Dependencies

Calculation Approach:

Reduced GHG Emissions from CVR/VVO Energy Reduction	Customer Energy Reduction (MWh)			X	Value of GHG Avoidance ($/kWh)
Reduced GHG emissions from Remote Disconnect "Soft Close" Avoided Energy	Non-Technical Loss (kWh/year)	X	AMI Benefit (%)	X	Value of GHG Avoidance ($/kWh)

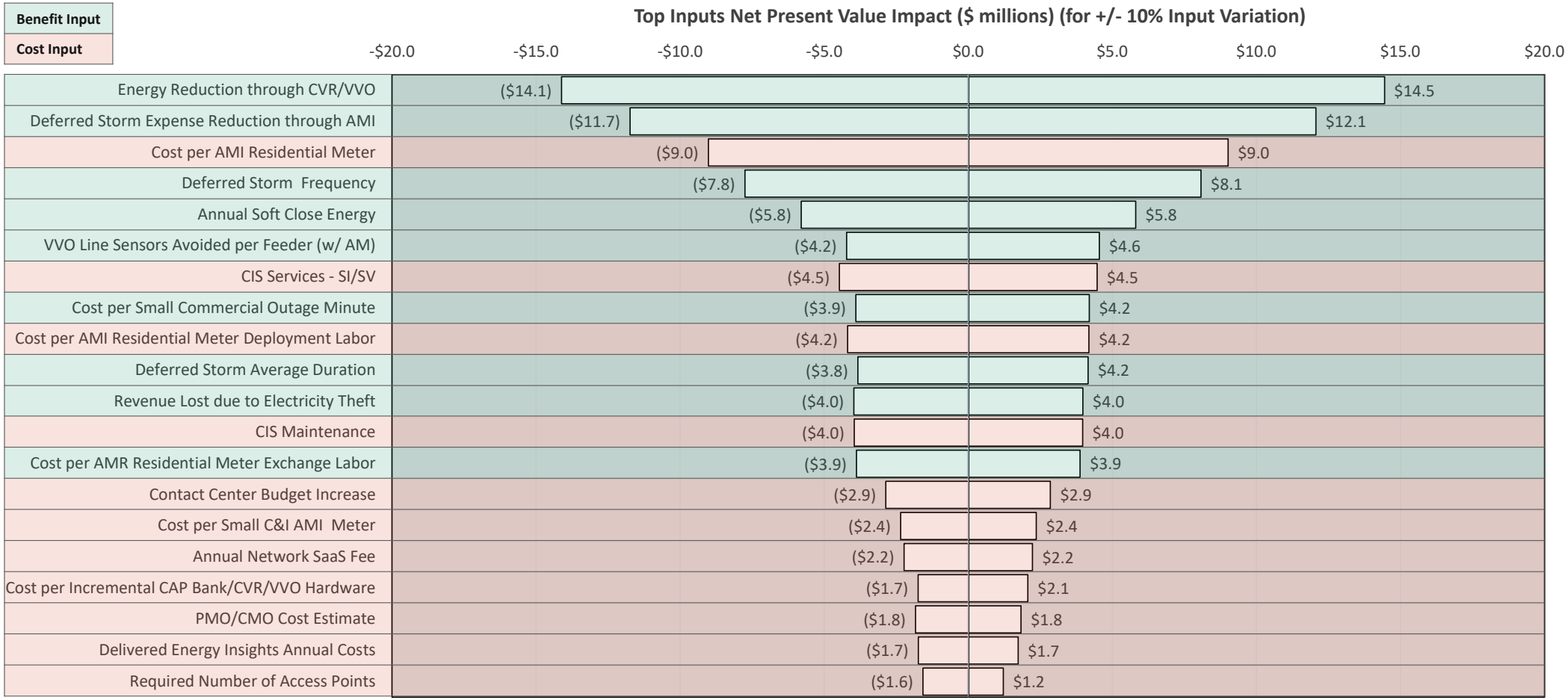
Benefit by Year ($ in millions):

* Represents Average (2028 – 2042)

	2021	2022	2023	2024	2025	2026	2027	Average*	Total	NPV
Energy Reduction through CVR/VVO	$0.00	$0.00	$0.00	$0.00	$0.00	$0.32	$1.35	$12.87	$194.69	$69.26
Energy Reduction through Remote Disconnect "Soft Close"	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.40	$2.50	$37.96	$15.05
Total	$0.00	$0.00	$0.00	$0.00	$0.00	$0.32	$1.74	$15.37	$232.65	$84.32

Sensitivity Analysis and Other Benefits

The top 20 inputs impacting modeled net present value are shown below leveraging a consistent +/- 10% in order to highlight the relative impact of these example inputs



AMI also enables qualitative benefits to Eversource customers and operations

Customer Benefits

Benefit Category	Description of Benefits
Rate options (including EV)	Additional choices for customers to save money and incentives for BTM technologies or EVs
Streamlined internal operations	Internal productivity improvement such as fewer bill exceptions and estimation
Savings on bill	Reduced energy and demand leading to bill savings
Increased convenience	Increasing number of self-service options
Increased control over use	More online tools to increase control over usage
Enhanced online portal	Improved customer engagement and satisfaction
Improved customer satisfaction	Empowered customers through availability of self-service channels increasing customer choices
High bill alerts	Improved customer awareness of usage
Detailed billing data	Identify customer value (by customer type) with access to daily delivered and received power, monthly demand, and instantaneous power data
Insights into Demand Response and Energy Efficiency	Provide granular AMI data to provide energy usage insights to DR and EE customers to keep participation mechanisms timely and relevant to customers
Outage status	Meter pings to relay information to customers about current outage status

Operational Benefits

Benefit Category	Description of Benefits
More accurate load profiles	Identifying opportunities for load-shifting, ZEV charging, and plant maintenance efficiencies
Validating resilience/reliability	Validating switching schemes, protection measures, etc.
Storm restoration efficiencies	Reduced calls to call centers and reduced data traffic on web portals, integrated voice recorders, and other customer reporting channels
Accurate information for CSRs	Granular data visibility to CSRs enabling better service
Momentary outage measurements and correlations	Potential opportunity to track and measure momentary outages (MAIFI) that is not currently tracked
More effective marketing	Through load profiles and customer energy use data, better customer segmentation and targeted advertisement of relevant programs
Field operations safety	The automation of certain meter reading and disconnect/reconnect tasks reduces mileage and streamlines interactions with customers

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1.0 APPLICABILITY

This Advanced Metering Infrastructure ("AMI") tariff provides for the recovery of incremental costs associated with the Company's implementation and deployment of AMI as approved by the Department of Public Utilities (the "Department").

The Company's rates for retail Delivery Service are subject to adjustment to reflect the operation of this AMI tariff. The AMI Factor ("AMIF"), as defined herein, shall be applied to all retail delivery service kilowatt-hours ("kWhs") as determined in accordance with the provisions of Section 3.0 below. The AMIF shall be determined annually by the Company, subject to the Department's review and approval. The operation of this AMI tariff is subject to Chapter 164 of the General Laws.

2.0 DEFINITIONS

2.1 Accumulated Deferred Income Taxes (ADIT) means the accumulated deferred income taxes associated with the Company's cumulative Eligible Investments as of the end of the respective AMI Investment Year. For the year in which the Eligible Investment was placed into service, the accumulative deferred income taxes will be determined on a monthly basis. The accumulated deferred income taxes for subsequent years shall be calculated based upon the average the beginning and ending calendar year balances.

2.2 Accumulated Reserve for Depreciation (ARD) means the Accumulated Reserve for Depreciation, including net salvage, associated with Company's cumulative Eligible Investments as of the end of the respective AMI Investment Year. For the year in which the Eligible Investment was placed into service, the Accumulated Reserve for Depreciation will be determined on a monthly basis. The Accumulated Reserve for Depreciation for subsequent years shall be calculated based upon the average of the beginning and ending calendar year balances.

2.3 Allowable AMI Recovery is the AMI Revenue Requirement defined below in Section 2.7. Allowable AMI Recovery can be an amount to be recovered from or credited to customers.

2.4 AMIF is the Automated Metering Infrastructure Factor that recovers or credits the annual Allowable AMI Recovery beginning _____ of each Recovery Year.

2.5 AMI Investment Year is the annual period beginning on January 1 and ending on December 31.

2.6 AMI Reconciliation is the difference between each year's Allowable AMI Recovery to be recovered or credited through the AMIF as approved by the Department and the billed revenue from the AMIF associated with the recovery or credit of the Allowable AMI Recovery. The AMI Reconciliation shall include interest on any balance, accrued at the same rate as that paid on customer deposits.

2.7 AMI Revenue Requirement is the revenue requirement associated with the Company's AMI-related plant-in-service for each AMI Investment Year prior to the Recovery Year,

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including cost of removal, plus Recoverable O&M Expense. For the year in which an Eligible Investment is recorded as in-service, the AMI Revenue Requirement will be calculated on a monthly basis. The AMI Revenue Requirement for subsequent years shall be calculated based upon the average of the beginning and ending calendar year balances. The AMI Revenue Requirement will be calculated to recover (1) the monthly revenue requirement for Eligible Investments recorded as in-service in the AMI Investment Year immediately prior to the Recovery Year; (2) the average annual revenue requirement for the calendar year ending December 31 of the AMI Investment Year two years prior to the Recovery Year, for cumulative Eligible Investments placed into service in the AMI Investment Years two years prior to the Recovery Year; (3) the annual revenue requirement for the Recovery Year on Eligible Investments recorded as in-service in the AMI Investment Year immediately prior to the Recovery Year; and (4) Recoverable O&M Expense.

2.8 Company is [insert company name].

2.9 Depreciation Expense (DEPR) is the annual depreciation expense associated with the Company's average annual cumulative Eligible Investments placed into service through the end of the calendar year prior to the Recovery Year. For the year during which the Eligible Investment is placed into service, the Company shall calculate depreciation expense for use in the AMI Revenue Requirement by (1) dividing the annual depreciation accrual rates determined in the Company's most recent base distribution rate case by 12, and (2) applying the resulting rate to the average monthly plant balances during the year. Depreciation expense for subsequent years may be calculated based on the average of the beginning and end of year plant balances.

2.10 Eligible Investments are the cumulative capitalized costs directly attributable to implementation of AMI recorded as in-service, including net salvage, and are used and useful at the end of the AMI Investment Year that is prior to the Recovery Year.

2.11 Gross Plant Investments are the capitalized costs of Eligible Investments recorded on the Company's books for Eligible Investments. Actual capitalized cost of Eligible Investments shall include applicable overhead and burden costs subject to the test provided in Section 4.0.

2.12 Pre-Tax Rate of Return (PTRR) shall be the after-tax weighted average cost of capital established by the Department in the Company's most recent base distribution rate case, adjusted to a pre-tax basis by using currently effective federal and state income tax rates applicable to the period for which the AMI Revenue Requirement is calculated.

2.13 Property Tax Expense (PTE) means the property taxes calculated based on Eligible net Investments multiplied by the Property Tax Rate. Property taxes will be excluded in the AMI Revenue Requirement in the first Recovery Year following the AMI Investment Year in which the eligible taxable plant went into service. Property taxes will be included in the AMI Revenue Requirement beginning in the second Recovery Year at 50% of the annual property tax amount. In subsequent years, the AMI Revenue Requirement will reflect a full year of property taxes.

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2.14 Property Tax Rate is the Company's composite property tax rate determined in the Company's most recent base distribution rate case, calculated as the ratio of total annual property taxes paid to total taxable net plant in service.

2.15 Rate Base (RB) is the investment value upon which the Company is permitted to earn its authorized rate of return.

2.16 Recoverable O&M Expense (O&M) is the incremental non-recurring O&M expense that is incurred by the Company as a result of implementing AMI, incurred directly by the Company or charged to the Company by its service company, including the amortization of capitalized information systems costs billed to the Company by its affiliate and recorded by the Company as expense, the cost of which is not being recovered through another cost recovery mechanism. Recoverable O&M Expense is the actual monthly AMI-related O&M expenses incurred in the AMI Investment Year prior to the Recovery Year. Recoverable O&M Expense will exclude pension and post-retirement benefits other than pension costs recovered through other reconciling mechanisms.

2.17 Recovery Period is the 12-month period during which the AMIF is in effect beginning on _____ and ending _____ of each year.

2.18 Recovery Year is the calendar year in which the AMIF becomes effective.

3.0 AUTOMATED METERING INFRASTRUCTURE FACTOR ("AMIF")

3.1 Rate Formula

$$AMIF_c = \frac{(AMI\text{-}ALLOW + PPRA) \times DRA_c}{FkWh_c}$$

Where:

c	Designates a separate factor for the following rate classes: [list rate classes].
$AMIF_c$	The Automated Metering Infrastructure Factor, by rate class, as defined in Section 2.4.
AMI-ALLOW	The Allowable AMI Recovery as defined in Section 2.3.
PPRA	The AMI Reconciliation Amount as defined in Section 2.6. Interest calculated on the average monthly balance using the customer deposit rate, as outlined in 220 CMR 26.09, shall also be included in the PPRA.
DRA_c	The Distribution Revenue Allocator representing the percentage of final revenue requirement allocated to each rate class as determined in the Company's most recent general rate case as follows:

[list of rate classes and allocation percentages]

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$FkWh_c$ The forecasted kWh to be delivered to the Company's retail delivery service customers.

3.2 Request for GMFs

The Company shall submit annually to the Department its proposed AMIFs by _____ to become effective for usage on and after _____.

3.3 Application of AMIFs on Customer Bills

For billing purposes, the AMIF will be included with the distribution kWh charge on customers' bills.

4.0 OVERHEAD AND BURDEN ADJUSTMENTS

For purposes of AMIF calculations, the actual overhead and burdens shall be reduced to the extent that actual O&M overhead and burdens in a given year are less than the amount included in base distribution rates as determined in the Company's most recent base distribution rate case. Such reduction shall be the difference between the actual O&M overhead and burdens and the amount included in base distribution rates.

In addition, the percentage of capitalized overhead and burdens assigned to AMIF projects shall be set equal to the ratio of AMIF to non-AMIF direct costs in any given year.

5.0 FILING WITH THE DEPARTMENT

5.1 Annual AMI Cost Recovery Filing

The annual AMI cost recovery filing shall be submitted to the Department by _____ and include, but not be limited to:

(1) Project documentation of all Eligible Investment recorded as in-service by the Company [or its affiliate] during the Prior AMI Investment Year;
(2) Documentation supporting non-recurring O&M expense as part of Recoverable O&M Expense;
(3) The AMI Reconciliation; and
(4) Bill impacts.

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AVAILABILITY

Service under this provision is available to residential customers receiving metered retail delivery service under the Company's Residential, Residential Assistance, Residential Space Heating, and Residential Space Heating schedules (Rates R-1, R-2, R-3, and R-4).

DESCRIPTION OF SERVICES

Unless otherwise determined by the Company, all residential premises shall be equipped with a meter that employs advanced metering technology (either Automatic Meter Reading (AMR) or Advanced Metering Infrastructure ("AMI") technology utilizing radio frequency or cellular transmitters to allow the Company to obtain meter readings remotely. However, residential customers may choose to "opt-out" by either notifying the Company of their request to not having an advanced meter installed at their location or having their advanced meter replaced with a non-advanced meter. At the customer's request, the Company shall exchange the existing advanced electric meter at the customer's location and install a non-advanced meter for the purpose of billing electric service to the customer. Upon receipt of the Customer's request, the Company shall use its best efforts to exchange meters as soon as possible after receiving the request. However, the Company reserves the right to flexibility in scheduling the meter exchange in an appropriate manner based on resource availability.

Customers who choose to opt-out will be charged an initial fee for the removal of the existing advanced meter and the installation of the non-advanced meter, pursuant to the Service Fees below. Customers who choose to opt-out will also be charged a monthly meter reading fee for the non-advanced meter, pursuant to the Service Fees below. If the Company is unable for any reason to read the meter on the regularly scheduled monthly read date, the Company shall make a reasonable estimate of the consumption of electricity during those months when the meter is not read, based on available data, and such estimated bills shall be payable as rendered. The monthly meter reading fee will be charged on estimated bills. The Company will not assess any fees until after the Company has installed the non-advanced meter.

Any opt-out customer who subsequently wishes to have an advanced meter installed or re-installed will be charged a "re-installation fee" pursuant to the Service Fees below. The re-installation fee will be charged for the removal of the non-advanced meter and the installation of an advanced meter. After an advanced meter has been re-installed, the Company will terminate billing the monthly meter reading fee.

SERVICE FEES

Removal of Advanced Meter/Installation of Non-Advanced Meter	$42.00
Monthly Meter Reading	$34.00
Re-installation of Advanced Meter	$42.00

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TERMS

The Company's Terms and Conditions in effect from time to time, where not inconsistent with any specific provisions hereof, are a part of this tariff.