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July 29, 2016

Honorable Kathleen H. Burgess
Secretary
State of New York Public
Service Commission
Three Empire State Plaza
Albany, NY 12223-1350

RE: Case 15-E-0050 Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service.

Case 16-E-0060 Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service

Case 14-M-0101- Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision

Dear Secretary Burgess:

As required by Ordering Clause 2 of the New York State Public Service Commission's *Order Approving Advanced Metering Infrastructure Business Plan Subject to Conditions* issued March 17, 2016, Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc. submit their Advanced Metering Infrastructure Customer Engagement Plan.

Very truly yours,
/s/
Kerri Kirschbaum
Senior Attorney

c: Active Parties List Case

AMI Customer Engagement Plan

July 29, 2016

July 29, 2016

Consolidated Edison Company of New York, Inc. ("Con Edison") and Orange and Rockland Utilities, Inc. ("Orange and Rockland") (collectively, "the Companies") provide their AMI Customer Engagement Plan. As stipulated in the New York State Public Service Commission ("Commission" or "PSC") *Order Approving Advanced Metering Infrastructure Business Plan Subject to Conditions* ("AMI Order")[1] issued March 17, 2016, and in accordance with Con Edison's Initial Distributed System Implementation Plan ("Con Edison DSIP")[2] submitted June 30, 2016, as well as Orange and Rockland's Initial Distributed System Implementation Plan ("O&R DSIP")[3] submitted June 30, 2016, the AMI Customer Engagement Plan ("the Plan") addresses topics ordered and referenced by the Commission.

The Companies made presentations to and engaged in discussions with Department of Public Service Staff ("Staff") and interested parties in developing the Plan, as required by the AMI Order. The Companies' approach to these discussions is summarized in the section titled, "Collaboration," and informs the subsequent sections of the Plan.

Michael Murphy, General Manager, Con Edison

Thomas Magee, General Manager, Con Edison

James Prettitore, Director, Con Edison

Keith Scerbo, Director, Orange and Rockland

[1] Case 15-E-0050, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Order Approving Advanced Metering Infrastructure Business Plan Subject to Conditions, (issued March 17, 2016)

[2] Case No. 14-M-0101*, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Initial Distributed System Implementation Plan, Con Edison (filed June 30, 2016)

[3] Case No. 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Initial Distributed System Implementation Plan, Orange and Rockland (filed June 30, 2016)

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1 Introduction

The Companies will engage customers and third parties and help them to understand and take advantage of the benefits of their Advanced Metering Infrastructure ("AMI") and Digital Customer Experience ("DCX") investments. These two initiatives will transform the companies' relationship with customers by providing a foundation for future innovation and change. A robust customer engagement plan is a key element in attracting and educating consumers about how they can better understand and manage their energy use, shop for renewable energy, enroll in energy efficiency programs, and provide and compare energy products and services.

The Companies are pleased to submit this Plan to be implemented with the AMI and DCX initiatives, which will enable customers to actively manage their energy use with information and services that:

- Communicate the greater control, choice, and convenience available to them with AMI meters
- Encourage customer and third-party adoption of AMI-enabled benefits
- Establish channels the Companies will use to communicate AMI-enabled benefits
- Support collaboration with third-party stakeholders to enhance AMI-enabled customer benefits and support Reforming the Energy Vision (REV) goals

The Plan reflects a customer-centric, collaborative strategy resulting from the Companies' research, customer surveys, benchmarking with peer utilities, and collaboration with third-party stakeholders. The Companies developed an engagement platform that ensures customers receive messages consistent with their preferences, and third parties receive messages that enable them participate in animating the REV market. In executing the Plan, the Companies will encourage adoption of AMI and provide customers with resources to better manage their energy usage and costs. During and beyond AMI rollout, the Companies will continue to identify opportunities to engage customers and third parties, and to improve customer and community relations.

1.1 Customer Engagement Plan Overview

In this document, the Companies jointly present their detailed plan for AMI customer engagement in response to the AMI Order, Con Edison DSIP and O&R DSIP. Below are select topic areas addressed in the Plan:

- **Collaboration:** A summary of stakeholder and third-party collaboration during the development of the Plan. These efforts include meetings and discussions with Energy Service Companies ("ESCOs"), Distributed Energy Resource ("DER") providers, customer advocacy groups, environmental advocacy groups, government agencies, vendors, consultants, and other interested parties.
- **Customer Education:** A three-phased Customer Education Plan directed toward increasing customer acceptance of AMI, facilitating implementation, and enabling customers to embrace current and future AMI-enabled benefits. For each phase, the Plan defines messaging, audiences, communication channels, and timing.
- **Green Button and Data Sharing:** A detailed implementation plan to enable customers to share interval energy usage data with authorized third parties through a national data sharing standard (i.e. Green Button Connect My Data®). Details include key activities, dependencies, a

timeline, and a budget. This section also summarizes future plans for additional data sharing capabilities to further animate the marketplace and enhance customer benefits.

- **Innovative Rate Design:** A pilot framework to determine responses to alternative rate structures by customer group and region. Results from this effort will inform future rate programs and design across the Companies' service territories to enhance customer benefits, increase system efficiencies, and promote sustainable energy practices.
- **New Cost Saving and Additional Revenue Opportunities:** A framework to support the creation of AMI-enabled cost saving and revenue opportunities by third parties in order to benefit customers. This section includes eligibility requirements, and a process for soliciting, evaluating, developing, and implementing third-party cost saving and revenue opportunities.
- **Smart Meter Opt-Out:** A solution for Con Edison customers to opt-out of receiving an electric or gas AMI meter. The Plan provides recommended amendments to Con Edison's current electricity and gas AMR/AMI Tariffs to accommodate all Con Edison residential customers, including those who reside in multi-family buildings, who wish to opt-out of receiving an electric or gas AMI meter for data privacy and security reasons. *Note: Orange and Rockland's smart meter opt-out program already allows all customers to opt-out of receiving an AMI meter.*
- **Submetering:** An explanation of benefits made available to submetered tenants as a result of Con Edison's AMI implementation and the spectrum of AMI-like benefits that submeter vendors may provide tenants. Also, the Plan provides a process for submeter vendors to propose new partnership opportunities with the Companies to enhance benefits for submetered tenants.
- **Local Law 84 (LL84):** Con Edison's cost-based analysis of the extent to which the fee associated with LL84 compliance can be reduced, based on improved processes through automation, streamlining and other efficiencies developed since origination. This includes estimated costs associated with the automatic upload of benchmark data into Portfolio Manager for both in-house and third-party solutions.
- **Data Privacy:** The findings from the Companies' data privacy assessment that will inform AMI data privacy planning. The assessment was conducted in consultation with West Monroe Partners, LLC ("West Monroe") using National Institute of Standards and Technology's ("NIST") Privacy and the Smart Grid recommendations and includes utility-specific data access principles derived from reputable Fair Information Practice Principles ("FIPP").

Together these topics will promote acceptance of AMI and its benefits. They provide a foundation for future innovation and change to improve our energy future.

2 Collaboration

As per the AMI Order and O&R DSIP, the Companies actively collaborated with over 25 organizations comprised of ESCOs, DER providers, customer advocacy groups, environmental advocacy groups, government agencies, vendors, consultants, and other interested parties in developing the Plan.[4] Please see Appendix A for a list of participating organizations. This effort ("Customer Engagement

[4] Approximately 50 organizations were invited to participate in the Customer Engagement Collaborative held between June and mid-July

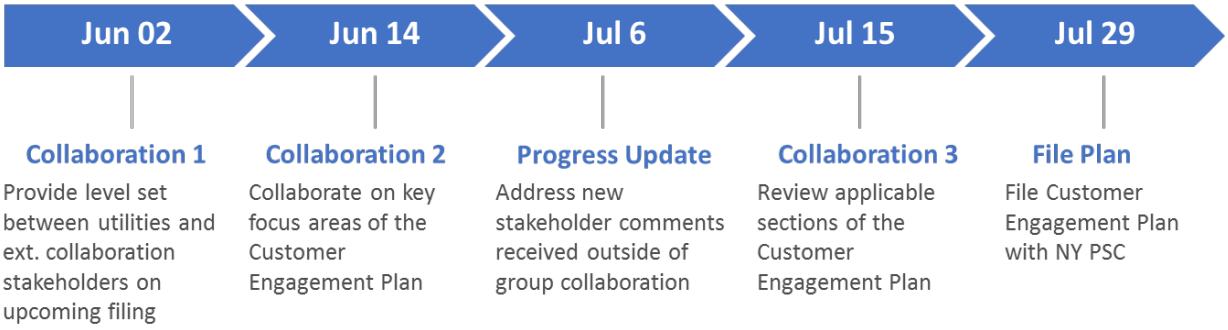
Collaborative" or simply "Collaborative") has demonstrated the benefits of broad collaboration, which include the sharing of best practices, insights, and lessons learned through the experiences of a wide variety of stakeholders that help improve and enhance the overall robustness of customer engagement planning.

The Companies focused collaboration efforts on four key areas: (1) Customer Education, (2) Green Button and Data Sharing, (3) Innovative Rate Design, and (4) Cost Saving and Additional Revenue Opportunities. In addition to these areas, the Companies also sought input from the Collaborative on the overall Plan and incorporated feedback where appropriate in order to improve the Plan for customers and interested parties. Lastly, in addition to the Customer Engagement Collaborative, the Companies consulted with numerous peer utilities, professional organizations, consultants, and vendors to gain additional insights and understanding necessary to develop a successful Plan. The section below outlines the Companies' approach to collaboration.

2.1 Approach to Collaboration

To provide meaningful and effective collaboration the Companies held workshops with the Customer Engagement Collaborative as shown in Figure 2-1 below. Workshops included three in-person meetings (with web and conference call option) and one 1.5-hour group conference call. The in-person collaborative workshops were held between June and mid-July at Con Edison offices and provided interested parties with briefings on the current status of the Plan, key areas for collaboration, and the opportunity to discuss Customer Engagement Plan topics. Collaborative members were encouraged to comment both during workshops as well as by email.

Figure 2-1 Timeline for Collaboration on the Customer Engagement Plan



The first collaboration workshop outlined the scope and role of the Collaborative and provided interested parties an overview of the topics to be discussed and ultimately included in the Plan. The Companies also provided a high-level overview and outline for each topic in order to provide Collaborative members a sense of the breadth and depth of each topic to be covered in the Customer Engagement Plan filing. Following an overview of the Plan, the Companies asked members of the Collaborative to comment on the current outline and offered clarifications where appropriate. Lastly, the Companies provided handouts of key areas of focus for follow-on collaboration, as well as contact information should interested parties wish to discuss topics with the Companies outside of the Collaborative.

The second collaboration workshop focused on providing updates to the Plan for participating organizations. This included further detail and Company plans around each of the topic areas. Following the presentation, Collaborative members openly discussed and commented on the various topic areas. Similar to the first collaboration workshop, members were encouraged to communicate any additional comments to the Companies.

In-between the second and third collaboration meeting the Companies held a progress update via conference call to inform members of current progress with respect to the Plan. In addition, at the request of several Collaborative members, and for purposes of transparency, the Companies provided a complete list of all stakeholder comments received outside of the previous collaborative workshops. The Companies also circulated their responses to each comment. In addition, the Companies provided responses to key comment themes derived from over 80 stakeholder comments received. Lastly, the Companies discussed various topics regarding the Plan with participating Collaborative members.

The Companies conducted the third and final collaboration workshop on July 15th. During this workshop the Companies focused on providing Collaborative members with explanations of how collaboration to date helped inform the development of the current Plan. The Companies also briefed the Collaborative on further efforts to provide members a more detailed representation of the Companies' approach to the July 29th Customer Engagement Plan filing. As in previous Collaboration workshops, participants were invited to comment during and after the Companies' presentation.

2.2 Additional Collaboration

In addition to Customer Engagement Collaborative efforts, the Companies engaged numerous organizations in order to gain further insights and understanding around multiple topic areas, such as Customer Education, Green Button and Data Sharing, Innovative Rate Design, and Submetering. The organizations consulted included peer utilities, professional organizations, governmental agencies, advocacy groups, Staff, consultants, and vendors. Similar to the Collaborative effort, this additional outreach was aimed at improving and enhancing the overall robustness of the Plan. Results of these efforts are reflected in various topic areas below.

3 Customer Education

The Companies are committed to a robust Customer Education Plan that increases customer acceptance of AMI, facilitates implementation and, most importantly, interests and continuously involves customers in maximizing the benefits of the Companies' AMI and DCX investments. The Companies recognize the importance of engaging all market segments, and the challenges in reaching all customers. To that end, the plan provides for customized approaches to the various market segments including low income, non-English and special needs customers, seniors, high usage customers, customers with plug-in electric vehicles, and customers with solar panels. The Customer Education Plan engages customers throughout the AMI implementation planning, installation, and post-installation processes by continuously seeking customer feedback to adjust communication messages and channels based on customer preferences.

Through their AMI systems, the Companies will provide customers with personalized benefits centered on control, choice and convenience. Customers will have the opportunity of participating in innovative rate programs and sharing data with third parties. The Customer Education Plan provides the foundation to prepare customers for installation and to take advantage of immediate AMI-enabled benefits and future benefits as new market opportunities are animated.

To develop the plan, the Companies consulted results from a recently conducted survey of customers within the Companies' service territories and peer utility benchmarks to develop three AMI customer education phases. These AMI phases complement an initial phase of messaging, 'Our Energy Future,' which began in 2016. Working together, these four education phases described below have distinct objectives and are coordinated with specific AMI program milestones.

(1) **Our Energy Future:** A current territory-wide communication from the Companies to give customers a broad context for upcoming changes in the energy landscape and new technologies

(2) **Aware:** A series of communication campaigns customized to each deployment area designed to notify customers of high-level smart meter benefits

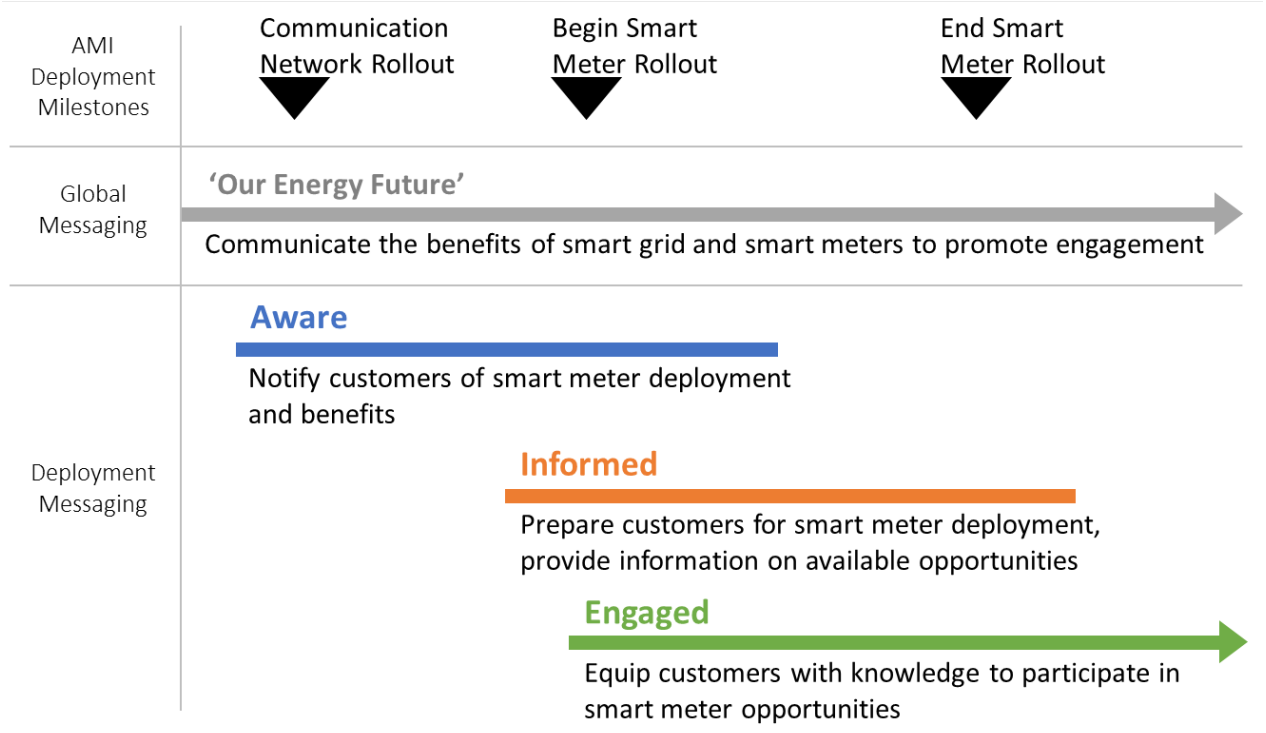
(3) **Informed:** A series of communication campaigns designed to prepare customers for smart meter deployment, reiterate smart meter benefits, and provide information on available program opportunities for each customer

(4) **Engaged:** Ongoing communications, starting from the day of meter installation to provide individual customers with the knowledge and insights to participate in smart meter opportunities

Each phase includes campaigns with defined messages, audiences, channels and education materials to increase the resonance between message and customer. These materials will reach a diverse audience and be presented in non-technical language with easily understandable text and accompanying graphics. Metrics have been developed to track participation and behavioral changes.

Figure 3-1 shows the three phases of Customer Education and the AMI milestones that trigger them.

Figure 3-1 Customer Education Timeline by Service Territory



As seen in Figure 3-1, 'Our Energy Future' messaging is underway, and will continue throughout the AMI deployment and beyond. The Aware phase will begin 30 days prior to the deployment of the AMI communications network in a local area, and will include meetings and communications with local and community leaders along with regional messaging. The Informed phase begins as meters are deployed for individual customers by providing a 45-day notification prior to meter installation. Finally, the Engaged phase begins with the installation of a customer's meter within a deployment area. As each deployment area has a discrete timeline, each will have its own Customer Education Plan schedule.

Sections 3.2 through 3.5 provide detailed descriptions of the Customer Education Plan, the sum of which is an integrated communication platform for both Companies, consistent with a customer-centric corporate strategy and industry trends.

3.1 Development of the Customer Education Plan

The development of the Customer Education Plan involved a holistic, iterative, and collaborative process with the Companies, Staff, and stakeholders in the Customer Engagement Collaborative. Research and benchmarking from a number of large energy companies that have implemented AMI provided information that proved useful in organizing the plan.

A successful plan must focus on understanding and anticipating the needs, priorities and expectations of customers. To that end, Con Edison surveyed their existing Advisory Community, which represents over 11,000 customers across multiple service classes to glean further insights regarding customer preferences and AMI understanding. To avoid a bias toward online customers, the Companies also conducted a telephone survey consisting of the same questions as the online survey. The 1,131 online respondents and 558 telephone respondents provided the following insights into customers' smart meter knowledge and communication preferences:

- **Overall awareness.** More than 50 percent of online respondents have some awareness of smart meters, while only 30 percent of telephone respondents report awareness.
- **Sources of knowledge.** The top three knowledge sources (friends, neighbors, family, or co-workers, online news sites and www.coned.com) are the same for online and telephone respondents. However, online respondents most often cited www.coned.com as a knowledge source, while telephone respondents most often cited friends, neighbors, family, or co-workers as their knowledge source. Additional knowledge sources include government agencies and emails from the Companies.
- **Confidence in the accuracy of sources.** Both groups report a high level of confidence in the sources that informed them about smart meters, with www.coned.com and email from the Companies among the highest-rated sources for both groups.
- **Trusted sources.** The top three most-trusted sources of information are consistently ranked across both groups: www.coned.com; government agencies; and friends, family, neighbors, and co-workers.
- **Favorability toward smart meters.** In the online survey, 68 percent of customers report positive feelings about smart meters. In the telephone survey, 49 percent of customers report they are positive. More online customers are aware of smart meters and 44 percent of telephone respondents report they are neutral on the topic. For both groups, the percentage of negative respondents is very low.

- **Interest in smart meter information topics.** Both groups are most interested in how smart meters might help them lower their bills and receive energy usage and high bill alerts.
- **Pricing plans and energy conservation.** Online respondents are more likely than telephone respondents to report interest in learning about pricing plans and energy conservation programs. However, levels of interest for both groups are robust, with approximately 70 percent of telephone respondents reporting interest in these topics and more than 85 percent of online respondents reporting interest.
- **General information.** Email, letters, and postcards are by far the most preferred methods. Radio, advertisements, and social media are the least preferred methods for both groups.
- **Information about benefits and services.** Both groups also prefer email, letters, and postcards to learn about benefits and services.
- **Timing of notifications.** Both groups of respondents are most likely to request 30- and 90-day advance notice of their meter replacement. Telephone respondents (52 percent) are more likely than online respondents (39 percent) to request 90-day notification.
- **Method of notification.** Telephone respondents most prefer to be notified of their meter replacement by letter or postcard.

These results helped inform the Companies' Education Plan. For instance, preferences on method and timing of notification directly influenced the messaging approach in the Plan. Survey results on trusted information sources and the favorability of smart meters establish a baseline of AMI knowledge that will guide future messaging. As proposed by Staff, the Companies will conduct another survey at a minimum of three months prior to AMI deployment to assess customer awareness and understanding as well as to clarify messaging and communications channels.[5] In addition, the Companies will regularly use the results of surveys and focus groups to learn and adjust the programs so that messages arrive at the right time through the right channel.

As the Companies develop a preference center as part of their DCX website revisions, the channels and messages will become increasingly self-selected by the customers. The Companies also have the capability to implement software options that analyze which education and engagement communications are most effective for each customer segment, and adjust accordingly. One of the Plan's strengths is that it will allow flexible and measureable communications as the customer base evolves and becomes more engaged.

3.2 Our Energy Future

In the summer of 2016, the Companies launched 'Our Energy Future', a series of high-level messages that provide customers a context for new technologies, animating a distributed energy market and the

[5] Case 15-E-0050, et al., *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service,* Department of Public Service Staff Comments Regarding Consolidated Edison Company Of New York, Inc.'s Advanced Metering Infrastructure Customer Engagement Plan (issued June 30, 2016); Case 14-E-0493, et al., *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Orange and Rockland Utilities, Inc. for Electric Service,* Department of Public Service Staff Comments Regarding Orange and Rockland Utilities, Inc.'s Advanced Metering Infrastructure Customer Engagement Plan (issued June 30, 2016)

changing energy landscape. Our Energy Future establishes the Companies as supporters of renewable energy and leaders in helping customers control their energy usage.

As customers seek to manage their energy use and costs, New York State, along with the Companies, will continuously work to further develop a clean, resilient and affordable energy system for New Yorkers. In support of this goal, Our Energy Future messages include how smart meters and AMI technology enable customer control over energy use by providing the data needed to make more informed decisions (choice), by increasing customer convenience, and by streamlining the Companies' relationship with customers.

Our Energy Future campaign alerts customers that smart meters will be installed in the Companies' service territories. The campaign will touch broadly on the benefits of smart meters and the technology that will upgrade the grid and enable customers to make more informed energy decisions.

As part of Our Energy Future, the Companies are developing a series of infographics and a motion graphic video for use on the web and in social media. The messages will be included as part of the Companies' energy education campaign (summer 2016 to fall 2016), which will be seen on subways, buses, electronic screens in subway stations, outdoor kiosks, and other out-of-home locations as well as in traditional media.

The messages throughout Our Energy Future introduce smart meters and the smarter grid, and reference basic benefits of AMI.

Our Energy Future is ongoing, and will continue beyond the AMI deployment. Messages, channels, and education materials are shown in Table 3-1. The Companies will adjust activities based on feedback from customers, focus groups, and surveys.

Table 3-1 Our Energy Future Details

Channels	Audience	Education Material
• Companies' Our Energy Future web pages (conEd.com/energyfuture) (oru.com/energyfuture) • Subway and other out-of-home advertisements • Social Media (Twitter/Facebook)	• Customers • Community leaders	• Smart meter infographic • Social media micro graphics • REV infographic • Motion graphic video • Energy education campaign

3.2.1 Our Energy Future Example Education Material

Figure 3-2 Con Edison and Orange and Rockland Twitter Example

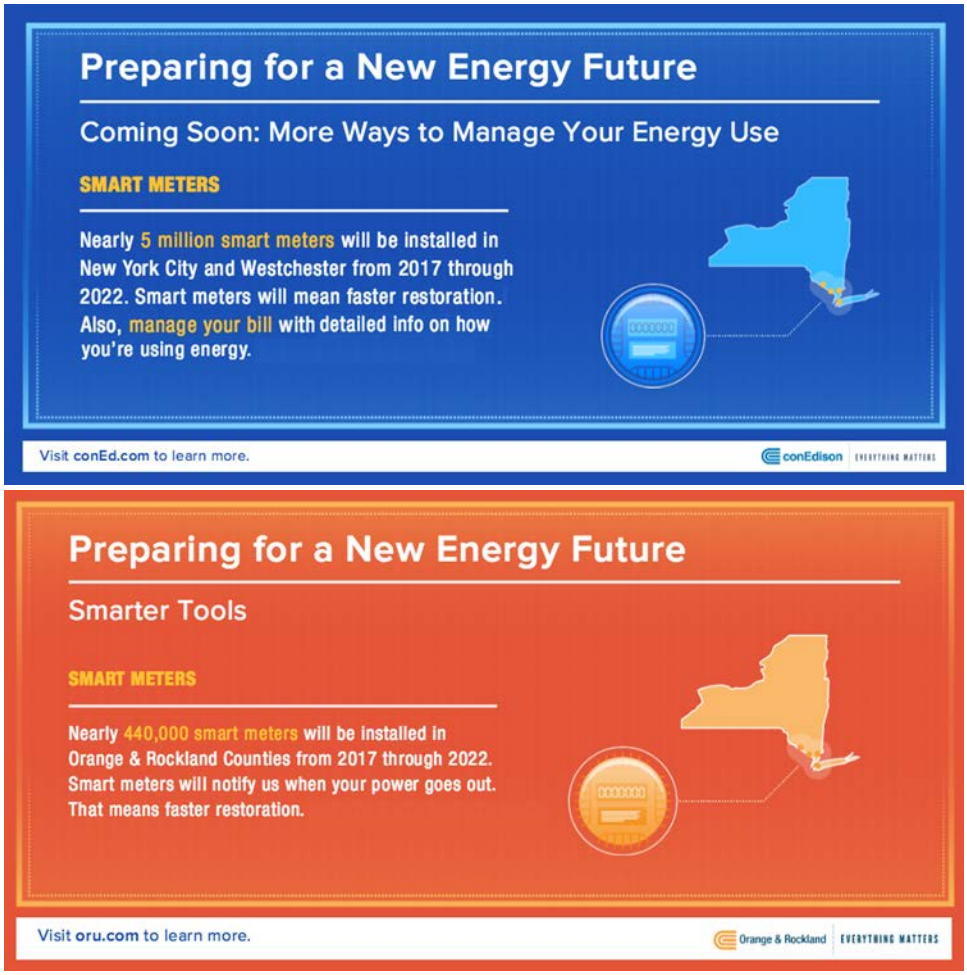
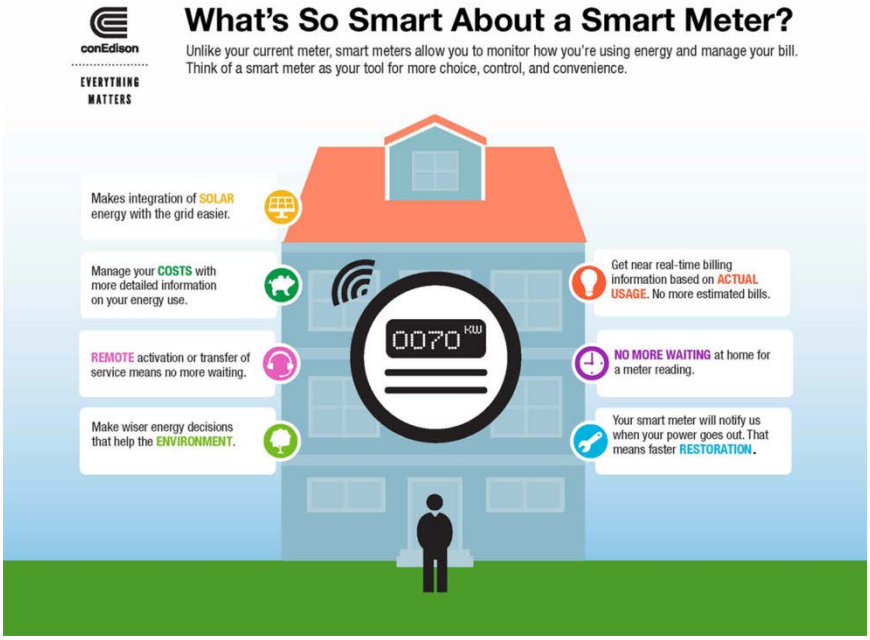


Figure 3-3 Video Screen Shot

Figure 3-4 Smart Meter Infographic



3.3 Aware Phase

The Aware phase will begin 30 days prior to the deployment of the AMI communications network in a local area. Community leaders will be briefed on smart meter deployment to prepare them for customer questions and support the AMI deployment efforts. Additionally, customers will be notified of smart meter benefits to increase customer acceptance and facilitate implementation of the AMI deployment. The expected outcome is to ready community leaders and have customers that are willing and eager to realize the benefits of AMI. Each deployment area will have an Aware phase tailored to the customer segments in that area.

Messaging during the Aware phase will build upon Our Energy Future and continue to emphasize smart meter benefits and opportunities to give customers more control, choice and convenience. Other messages will provide inquiring customers with safety, privacy and security information. To meet these

objectives and deliver these messages, the Aware phase is organized into three campaigns: (1) Involve Local and Community Leadership, (2) Deliver Regional Messaging, and (3) Respond to Non-Adopter Concerns. Table 3-2 summarizes the Aware phase activities.

Table 3-2 Aware Phase Campaigns

Involve Local and Community Leadership	Deliver Regional Messaging	Respond to Non-Adopter Concerns
Involve the local and community leaders in the deployment areas	Deliver messages to customers within the deployment areas to foster an awareness of smart meter benefits and address typical concerns	Prepare Companies and their call center representatives to respond with current science and industry knowledge

3.3.1 Involve Local and Community Leadership Campaign

The Companies have strong relationships with community leaders and view them as important partners in customer education. As the Companies have learned from the customer surveys, these leadership groups are among the most trusted sources for customer information. Prior to deployment of the communication network, the Companies' corporate affairs and customer outreach resources will contact various customer, government, and advocacy organizations to provide an AMI overview and to discuss venues to share AMI information. This open dialogue will continue throughout the Inform and Engage phases.

The objectives of the local and community leadership campaign are to:

- brief public officials,
- brief and gain support from community leaders,
- involve the community leader channels, and
- provide Company messaging and education materials.

The messages of this campaign are focused on:

- customer control, choice, and convenience;
- deployment overview and schedule as available;
- what the customer has to do and the meter installation process;
- education and smart meter benefits and opportunities;
- customer access to data;
- simple, voluntary data sharing with third-party providers; and
- easier meter reading process.

The Companies' outreach and corporate affairs organizations will hold face-to-face meetings with various customer, government, and advocacy organizations. Emails and phone calls will be used to reach

the different organizations, and to establish follow-up face-to-face meetings as necessary. Education materials provided to the community leaders will be available in hard copy and digital form. Table 3-3 summarizes the local and community activities.

Table 3-3 Local and Community Leadership Campaign Details

Channels	Audience	Education Material
• Meetings • Email • Phone calls	• Public officials • Community leaders	• Infographic • FAQs (print) • Deployment overview (map) • Customized engagement tools demo

3.3.2 Deliver Regional Messaging Campaign

As the companies deploy the AMI communication network, messages will be delivered to customers within the deployment areas to foster an awareness of smart meter benefits and address typical concerns. In addition, given the information gathered through the customer survey, the Companies will send an introduction notification 90 days prior to the customer receiving their smart meter. This effort will create an environment that eases the deployment of the AMI communication network and smart meters. The Companies will also train call center representatives to provide customers with answers to any clarifications they may require as it relates to regional messaging.

The objectives of the regional messaging campaign are to:

- raise awareness of AMI communication network deployment,
- increase acceptance of smart meters, and
- facilitate meter and communication network deployment.

The messages of this campaign are focused on:

- customer control, choice and convenience;
- education and smart meter benefits and opportunities;
- general information on privacy, security, health concerns;
- companies' AMI web pages;
- deployment overview; and
- ways to conserve.

Each deployment area will receive the same messages across a wide range of channels to reach the full spectrum of customers within a given service area. The use of channels will vary based on demographics, lessons learned, and data from survey results and focus groups. Education materials will be multi-lingual and language interpreters will attend community meetings and events. The website will contain the latest information, and emails and paper mailings will deliver the regional awareness

messages. Call centers will be prepared with education materials to inform and support customers who choose to call the Companies regarding AMI implementation. In addition, Company outreach coordinators will work with various consumer, government, and advocacy organizations to identify appropriate venues to share AMI information with special needs customers. This preparation across a comprehensive set of channels will enable the Companies to educate customers through their preferred communication channel. Table 3-4 summarizes the regional messaging campaign.

Table 3-4 Regional Messaging Campaign Details

Channels	Audience	Education Material
• Direct mail – "Intro. Notification" • Bill messages and inserts (Customer News) • Media • Local and community leaders (see above) • Community meetings / events • Companies' websites • Advertising	• Deployment area population	• Intro. notification • Fact sheet • Infographic • FAQs • Deployment overview (map) • Generic customer messages (alerts) • Website demonstrations

3.3.3 Respond to Non-Adopter Concerns

The Companies are aware of previous utility AMI deployments and the concerns of some customers about safety, privacy, security, and cost. The Companies will prepare their internal resources, including their call center representatives, to respond to non-adopters of AMI with information that includes current science and industry knowledge in order to best respond to the concerns of these customers.

This campaign is triggered by customers contacting one of the Companies and reflects the Companies' understanding of the customers' concerns and best available data. Table 3-5 summarizes the non-adopter concern response campaign.

Table 3-5 Respond to Non-Adopter Concerns Details

Channels	Audience	Education Material
• Call Center (inbound) • Phone calls (outbound) • Letters • Community meetings	• Non-adopters	• Call center talking points • Scientific references and papers

3.3.4 Aware Phase Example Education Material

The Companies' research included the review of education material from other utility AMI deployments. The Aware Phase will include education materials aligned with successful examples employed throughout the industry. The Companies recognize that consistent messaging is important, and each

Company will develop education materials in their own look and feel to further develop a long-term brand association with their customers. The education material will be clear, simple, non-technical and available in multiple languages based on customer demographics. Figures 3-5 and 3-6 are presented as examples of hard copy materials.

Figure 3-5 Regional Messaging Campaign – Example Bill Insert

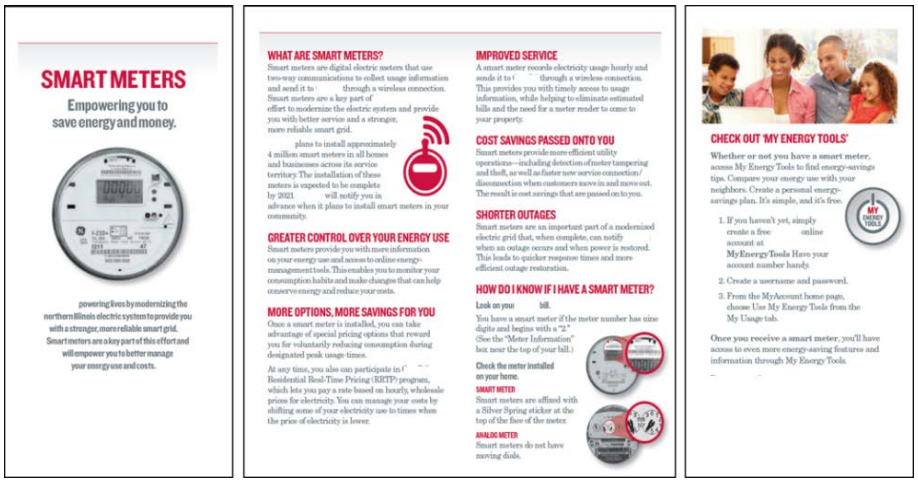


Figure 3-6 Regional Messaging Campaign – Example Fact Sheet

3.3.5 Aware Phase Summary

The Aware phase is designed to increase customer acceptance and facilitate implementation of the AMI deployment. Although the messages are consistent across the service territory, the channels will vary by deployment area in order to reach the widest set of customers. Table 3-6 summarizes the activities in the entire Aware phase.

Table 3-6 Aware Phase Summary

Messages	Channels	Audience	Education Material
Local and Community Leadership Campaign			
• Deployment overview and schedule as available • What the customer has to do and the meter installation process • Education and smart meter benefits and opportunities • Customer access to data • Simple, voluntary data sharing with third-party providers • Easier meter reading process	• Meetings • Email • Phone calls	• Public officials • Community leaders	• Infographic • FAQs (print) • Deployment overview (map) • Customized engagement tools demo
Regional Messaging Campaign			
• Education and smart meter benefits and opportunities • General information on privacy, security, health concerns • Companies' AMI web pages • Deployment overview • Ways to conserve	• Direct mail – "Intro. Notification" • Bill messages and inserts (Customer News) • Media • Local and Community Leaders (see above) • Community meetings / events • Companies' websites • Advertising	• Deployment area population	• Intro notification • Fact sheet • Infographic • FAQs • Deployment overview (map) • Generic customer messages (alerts) • Website demonstrations
Non-Adopter Concern Response			
• Provide best available data to allay customer concerns around safety, privacy, security, and cost	• Call Center (inbound) • Phone calls (outbound) • Letters • Community meetings	• Non-adopters	• Call center talking points • Scientific references and papers

3.4 Informed Phase

The Informed phase starts 45 days prior to the first smart meter installation in each deployment area. The Informed phase prepares customers for smart meter deployment and provides information on

available benefits and opportunities. The Informed phase reflects lessons learned from the customer survey results and other utility benchmarking. The expected outcome is to allow for smart meter deployment with minimal inconvenience to customers while informing them of smart meter benefits, opt-out options, and the provision of data security.

Building upon the messaging of the Aware phase, the Informed phase will advance customers' understanding of smart meter benefits and continue to emphasize control, choice, and convenience. Each deployment area will receive multiple messages through three campaigns: (1) Schedule and Deploy, (2) Opt-out Coordination, and (3) Mitigate Inconvenience. Table 3-7 summarizes the Informed phase activities.

Table 3-7 Informed Phase Campaigns

Schedule and Deploy	Opt-Out Coordination	Mitigate Inconvenience
Provide customers with clear and accurate information to prepare them for and facilitate the installation of their AMI meter, and inform customers of opt-out process and address other concerns	Further educate customers on smart meter benefits and the opt-out process	Address customer inconveniences that may occur as a result of their AMI meter installation

3.4.1 Schedule and Deploy Campaign

Specific information will be presented to the six segmented audiences, listed in Table 3-8 below, as a notification prior to smart meter deployment. Given past experiences with meter replacement, the Companies have decided that the most effective deployment notification should be delivered to customers 45 days before their smart meter is installed. In addition, the Companies will make installation information as well as security and data privacy education materials and references available to customers through multiple channels throughout this campaign.

The objectives of the schedule and deploy campaign are to:

- provide clear and accurate information to prepare customers for meter installation,
- facilitate meter deployment, and
- provide information on customer data security and privacy.

The messages of the schedule and deploy campaign include customer choice and convenience and highlight:

- meter replacement timing,
- customer benefits and what they may expect,
- available customer opportunities,
- directions for customer Portal access,
- opt-out information,
- customer data security and privacy, and
- contact information.

Table 3-8 summarizes the schedule and deploy campaign.

Table 3-8 Schedule and Deploy Campaign Details

Channels	Audience	Education Material
• Direct mail (45-day notification) • Companies' AMI web pages (deployment map, FAQs, customer data access) • Local AMI outreach presence • Company and meter installer call center	• Deployment Area: (1) Residential (2) Commercial (3) Tin-Case (Con Edison only)[6] (4) Life Support Equipment (5) Utility Installed Meters Phase 1 (to be timed according to separate deployment schedule) (6) Utility Installed Meters Phase 2 (to be timed according to separate deployment schedule)	• 45-day notification • Door hanger – install complete • Door hanger – "Sorry we missed you" • Talking points for meter deployment vendor • Meter installer call center scripting • Company call center scripting • Program opportunities as appropriate

3.4.2 Opt-Out Coordination Campaign

The Companies have focused their opt-out coordination campaigns on decreasing the number of customers that refuse to allow installation of smart meters by proactively alleviating typical concerns through awareness and education. For those customers who choose to opt-out even after reviewing the information, the Companies provide a clear opt-out process.

Opt-out information is included in the 45-day letter and will point the customer to the process described in Section 7.1, Current AMR/AMI Opt-Out Tariff. Opt-out coordination will be handled by employees specifically trained to provide customers with accurate and up-to-date information regarding smart meters and the available opt-out process. The Companies will also augment call center and installation staff with outreach resources to handle specific cases. Table 3-10 summarizes the opt-out campaign.

The objectives of the opt-out coordination campaign are to:

- educate customers and
- reduce opt-outs.

The messages of this campaign will include customer choice and reiterate:

- benefits of smart meters;
- safety, security, and privacy facts; and
- opt-out processes and charges.

[6] Tin-case meters are special types of gas meters that need to be replaced by Con Edison (as opposed to just having the AMI module installed).

Table 3-9 summarizes the Companies' Opt-out coordination campaign.

Table 3-9 Opt-Out Coordination Campaign Details

Channels	Audience	Education Material
• 45-day letter • Companies' websites • Phone call • Local AMI outreach presence	• Concerned customers	• Phone talking points • Letters • FAQs (includes scientific references and papers)

3.4.3 Inconvenience Mitigation

The Companies recognize that meter installation at a customer's premises can result in customer inconvenience. Typically, these inconveniences are associated with the need to be home to allow access, scheduling appointments, or difficulty installing meters, which can lead to delays or property damage. Customers may also associate AMI with higher bills. As such, the Companies will train their call center representatives to resolve such issues.

The objective of the inconvenience mitigation campaign is to:

- address customer concerns resulting from installation of the new meter.

The messages of this campaign address:

- appointment scheduling,
- property damage recovery process, and
- utility bill explanation.

The activities for inconvenience mitigation are responsive to customer concerns and will be handled by the Companies' and Installers' call centers or elevated to other departments as necessary. Table 3-10 summarizes inconvenience mitigation for the Informed phase.

Table 3-10 Inconvenience Mitigation Details

Channels	Audience	Education Material
• Companies' call centers • Installer call center • Local AMI outreach presence	• Concerned customers • Impacted customers	• Phone talking points • Letters

3.4.4 Informed Phase Example Education Material

Consistent with each of the phases, each Company will design education materials aligned with successful examples employed throughout the industry that will be clear, simple, non-technical, and

available in multiple languages based on customer demographics. Figures 3-7 and 3-9 are presented as examples of hard copy materials.

Figure 3-7 Schedule and Deploy Campaign – Example Deployment Notification Postcard

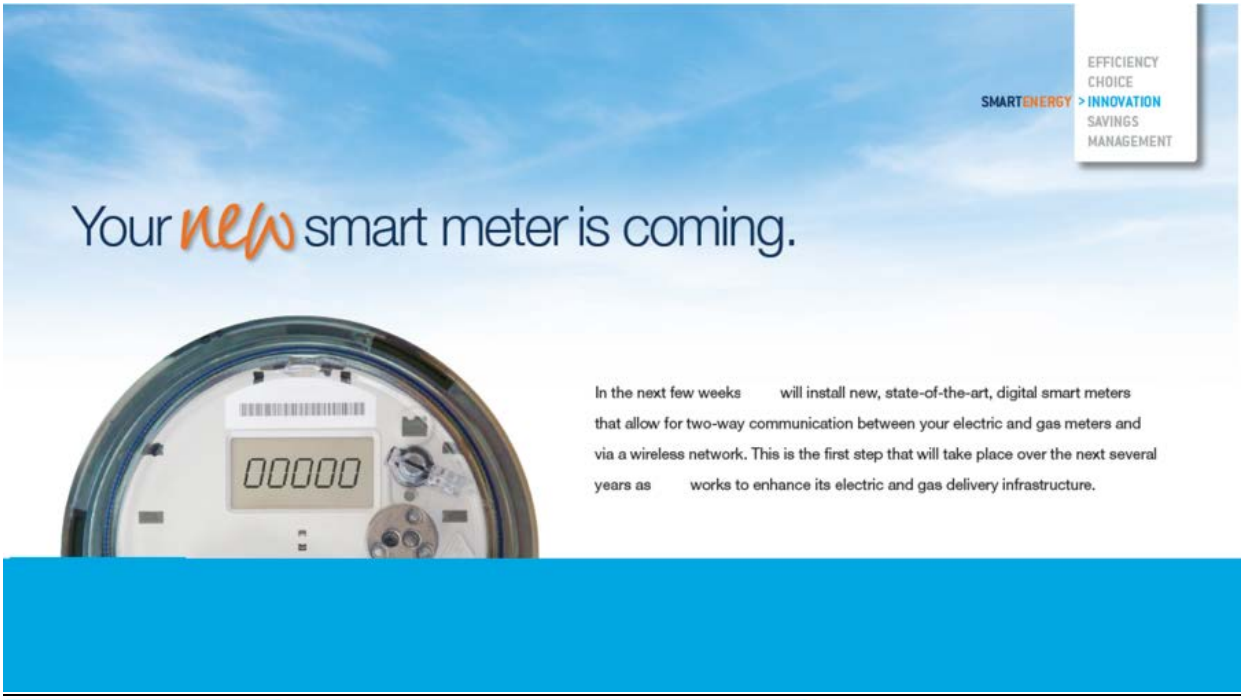


Figure 3-8 Schedule and Deploy Campaign – Example Install Complete Door Hanger

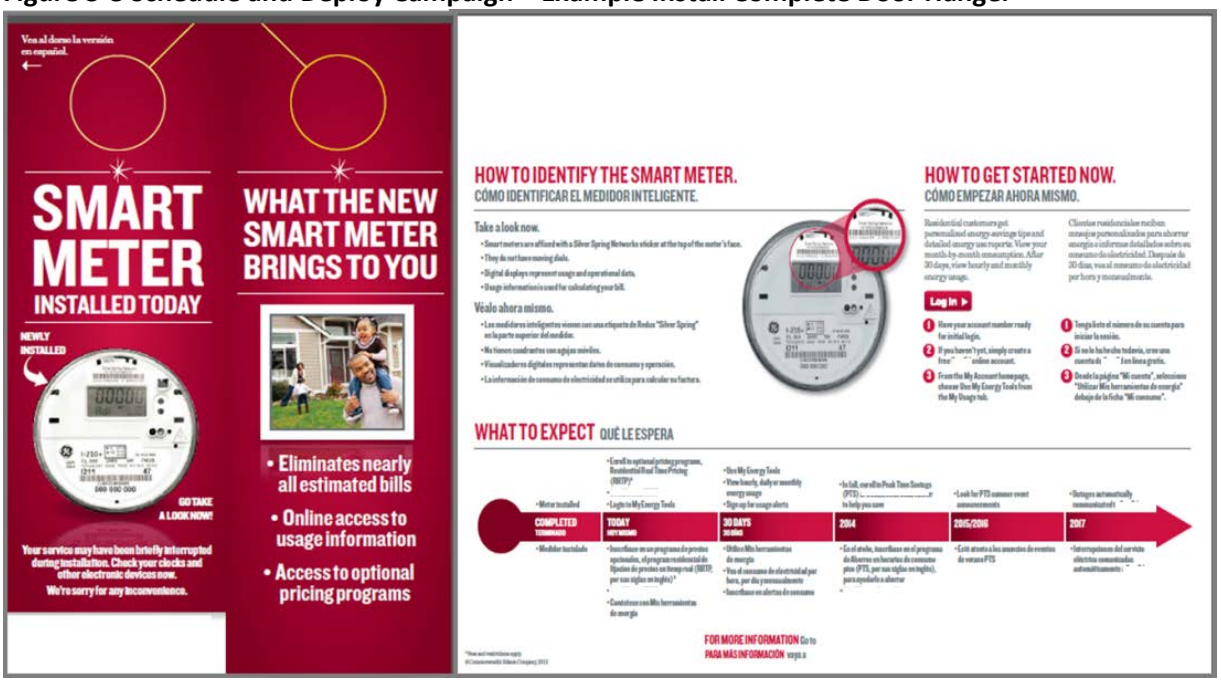


Figure 3-9 Schedule and Deploy Campaign – Example Missed Install Door Hanger

3.4.5 Informed Phase Summary

The Informed phase overlaps with the Aware phase, and adds to the benefits message with details of installation, opt-out, and data policies. The primary channels of this campaign are direct mail notifications (45 days prior) with supporting information available online, an outreach presence which is available for face-to-face discussion and call centers trained in the AMI implementation and typical customer concerns. The notifications will point customers to online resources, while the AMI outreach presence and call centers are available to discuss concerns directly with the customers. Table 3-11 summarizes the entire range of activities for this phase.

Table 3-11 Informed Phase Summary

Messages	Channels	Audience	Education Material
Schedule and Deploy Campaign			
• Meter replacement timing • Customer benefits and what they may expect • Available customer opportunities • Directions for customer Portal access • Opt-out information • Customer data security and privacy • Contact information	• Direct mail (45-day notification) • Companies' AMI web pages (deployment map, FAQs, customer data access) • Local AMI outreach presence • Company and meter installer call center	• Deployment Area: (1) Residential (2) Commercial (3) Tin-Case (Con Edison only) (4) Life Support Equipment (5) Utility Installed Meters Phase 1 (to be timed according to separate deployment schedule) (6) Utility Installed Meters Phase 2 (to be timed according to separate deployment schedule)	• 45-day notification • Door hanger - install complete • Door hanger – "Sorry we missed you" • Talking points for meter deployment vendor • Meter installer call center scripting • Company Call Center scripting • Pilot program opportunities as appropriate
Opt-out Coordination Campaign			
• Benefits of smart meters • Safety, security, and privacy facts • Opt-out processes and charges	• 45-day letter • Companies' websites • Phone call • Local AMI outreach presence	• Concerned customers	• Phone talking points • Letters • FAQs
Inconvenience Mitigation			
• Appointment scheduling • Property damage recovery process • Utility bill explanation	• Companies' Call Centers • Installer Call Center • Local AMI outreach presence	• Concerned customers • Impacted customers	• Phone talking points • Letters

3.5 Engaged Phase

The Engaged phase provides customers with knowledge to participate in smart meter opportunities. This phase starts as customers receive their smart meter. The objective of the Engaged phase is to further develop long-term relationships with customers through continued interactions that create informed energy users. During this phase, the Companies will assess and use insights gathered from customer surveys, focus groups and outreach experience to refine and promote new customer opportunities and future third party offerings. These activities will facilitate greater customer participation in the Company's demand response (DR) programs, increase access to energy efficiency tools, and provide for other energy management opportunities offered through innovative third-party vendor value-added products and services.

The Companies have tools in place to increase customer education and engagement, and investments are being shifted towards digital channels. These digital channels will have the ability to learn and store customer preferences for the delivery of personalized, timely, effective, and educational communications. These communications will allow customers to make smarter energy decisions. The engagement tools paired with AMI data, allowing the Companies to transform their relationship with customers by proactively providing new usage insights to customers.

The Engaged phase provides digital experiences while still recognizing many customers prefer non-digital channels. Outreach programs will provide education materials through social and traditional media to augment face-to-face outreach from Companies' staff. The Engaged phase is a long-term, holistic approach leveraging many digital and non-digital channels to engage and educate customers.

3.5.1 Digital Customer Experience

Among the digital channels used for continued customer engagement is the DCX portal, which is an element of the Companies' DCX program. The Companies will create value for customers by developing an enhanced web portal to provide access to personalized and helpful energy usage data. The portal enables customers to leverage this information to gain insights about their energy use, and turn those insights into action. Specifically, the portal will:

- Provide customers with a simple, intuitive method to view their current and historical energy use measure by their AMI meter in graphical form.
- Provide a personalized experience anywhere, anytime, on any device.
- Provide customers the ability to download usage data in various forms, including Green Button[7] format, the national standard.
- Provide improved analytical capabilities to better understand customer behavior and empower customers with tools to make informed decisions today. The portal's design is flexible in anticipation of changes that will help meet the needs of tomorrow. Provide the ability to overlay additional data in graphical format, including weather, price, and bill cost data, as well as facilitating comparison to "neighbors."
- 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.

[7] http://energy.gov/data/green-button

- Provide the ability for the customer to disaggregate their usage (i.e., understand what is driving their usage patterns) to determine how their energy is being used.
- 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.

DCX portal functionality will be tailored to specific customer segments such as residential, small business, and large commercial/industrial, and optimized for viewing on all devices (e.g., mobile phones, tablets, and computers). The portal will be integrated with the Companies' websites, providing customers seamless access using a single sign-on process. This multi-channel experience extends to the Customer Call Center which will have access to the same data screens as the customer.

The end result of the DCX portal is a low-effort, high-satisfaction digital customer experience that will drive increased customer adoption of digital channels. With a "customer first" guiding principle, DCX sets the Companies' direction while the AMI system provides the platform that helps bring it to life.

3.5.2 Personalized Data Insights

An important element of customer engagement is personalization. Traditional utility communications have been largely one-size-fits-all. The Companies are committed to the use of a software platform that will send information relevant to each customer's unique situation. The information can take the form of periodic energy reports for customers, customized with information ranging from new pilots to energy saving tips to benchmark comparisons. The tips can be further refined based on publicly-available non-utility information about the customer, such as the age of their house. Set forth below is a description of the tools integrated into the DCX portal that the Companies will employ to increase customer engagement:

- A user-friendly, interactive visualization tool will allow customers to analyze their energy use trends through a series of views. Customers will be able to see their data by different time periods. Customers will also be able to see their bill costs in addition to usage data.
- A bill comparison tool will allow customers to compare their last bill to their previous bill, or to the corresponding bill from the same time period from the previous year. Comparing bills is a useful way for customers to track their energy use and identify possible causes for an increase or decrease in their bill. AMI data allows for a more personalized and detailed breakdown of bill differences, including the impacts of weather, rate plan changes and peak vs. off-peak usage.
- A forecast tool will show customers their current usage or cost to-date in the billing period, their projected usage or cost for the billing period, and their typical usage or cost for the period, based on historical usage. This tool informs customers before the end of the billing cycle if they are likely to have high usage or cost compared to the same time period from the previous year. Customers can then take action to reduce their consumption before the billing period ends.
- A visual, interactive tool for customers to obtain individualized advice about their usage by answering simple questions about their home attributes and energy habits. The tool provides customers with a better understanding of how they use energy in specific categories. With AMI usage data, the tool can calculate a breakdown for heating and cooling categories.

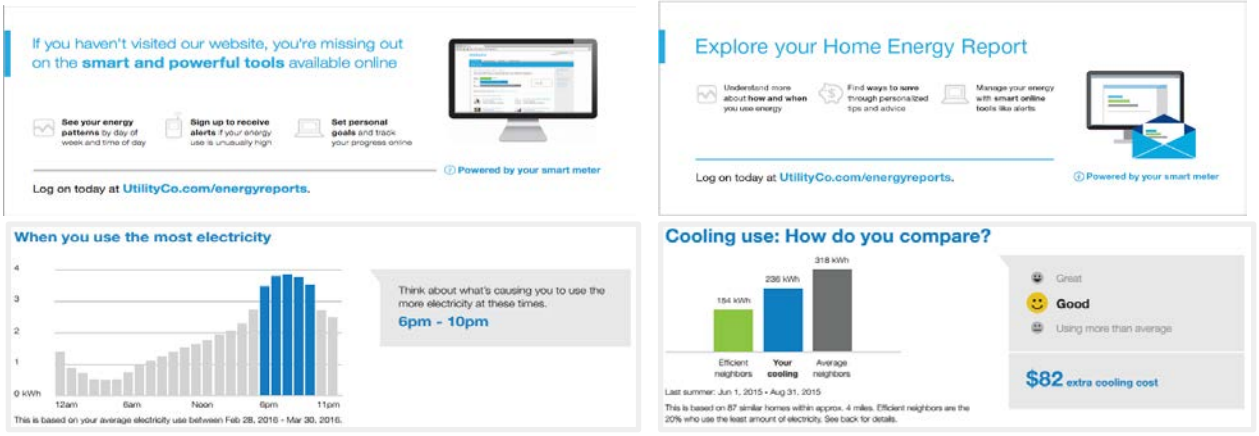
- A tool that displays a customer's average daily peak usage for the last month, so that customers can see during which hours of the day they use the most energy.
- A tool that uses disaggregation to compare a customer's use of heating and cooling to similar homes.
- A tool that estimates the percentage of energy used on heating and cooling over a season.
- Modules highlighting the resources available on the online portal, and encouraging customers to engage with the Companies online.

These tools are complementary to each other and will drive a customer journey for years after the AMI deployment. The AMI engagement tools integrated with the DCX portal are summarized in Figure 3-10.

Figure 3-10 AMI Engagement Tools Integrated with the DCX Portal

The education material in Figure 3-11 below shows examples of what the customer will see when utilizing these tools.

Figure 3-11 Example Energy Report Materials



3.5.3 Con Edison Pilots

Con Edison is currently testing home energy reports as the vehicle for ongoing, personalized outbound communication to customers. The pilot includes paper and digital communications that feature AMI enabled energy advice and insights to customers. The reports use proven data and behavioral science to provide energy comparisons to similar homes and actionable energy savings tips.

Industry research has shown that reports help to motivate customers to take action by reducing energy use, utilizing or installing Distributed Energy Resources ("DERs"), or otherwise engaging with energy markets. These reports enhance energy conservation and increase customer satisfaction. The reports also lead to increased participation in other energy programs offered by the utility or third parties to maximize the benefits realized by customers long after meter installation.

Another feature that Con Edison is currently testing is high bill alerts, which are a part of Con Edison's Connected Homes demonstration project[8]. For customers who would receive such alerts, this feature would let them know when they are trending toward a high bill and how they can quickly adjust their energy usage to mitigate. High bill alerts that incorporate AMI data can forecast each customer's total usage or cost at the end of the upcoming bill period, since they compare actual current-period usage to historic usage for each individual customer. Such a feature could increase acceptance of AMI and help customers manage their energy usage to save money.

For example, customers may log on to their respective Company's website soon after receiving a high bill alert. They would confirm that the bill was higher than recent bills with the bill comparison tool. They would then potentially see that they are forecasted to have a higher-than-usual bill for the current month. These insights will be driven by AMI data, which will improve customer sentiment around AMI. The customer could then see how their usage compares with comparable homes in their neighborhood. This information may prompt the use of the online home energy analysis tool and help customers manage their energy usage in a timely, personalized manner.

Con Edison will determine the overall customer satisfaction with these tools and use this information to inform the Engage phase.

3.5.4 Collaboration and Third-Party Providers

The Companies are expanding their collaboration with third-party providers and exploring the needs and means to jointly succeed in optimizing the AMI opportunities. This will be accomplished by consulting with third parties in the development and implementation of future customer opportunities. The Companies will coordinate these third-party opportunities with an outreach approach that integrates AMI deployment with customer tools and initiatives such as Green Button Connect My Data® and pricing pilots (see sections 4 and 5). These, as well as the DCX portal tools, are all ways in which the Companies drive changes consistent with REV and other New York State Energy Research and Development Authority (NYSERDA) initiatives, such as NY Prize and EmPower New York.

[8] http://www.coned.com/energyfuture/pdf/connected-homes-platform.pdf

3.5.5 Engaging All Customer Segments

There are customer segments throughout the Companies' service territories that require special engagement efforts. The customers may not be comfortable receiving messages through digital channels, may not have access to online services, or may be non-English speakers. A range of channels beyond digital means and in multiple languages will be used to engage these customers. Engagement with non-digital, seniors, low to moderate income ("LMI") and non-English speaking customers will include the efforts of Customer Outreach teams for each of the Companies. These teams will determine which customer segments are not receiving the appropriate messages and take action to fill those gaps. Mail, community groups, events, social services, libraries, theaters, and government centers can all be leveraged as channels for education materials or personal interactions.

Effective messaging can be sent through these channels, and provide meaningful opportunities for engagement. The Companies will continue to leverage translators so that the messaging is clear within the non-English speaking communities. The messages provided to special needs customers are consistent with the Engaged phase:

- current smart meter benefits available to customers,
- how to engage with smart meter benefits,
- how to engage with third-party opportunities,
- customer communication channel preferences, and
- new services as they roll out.

The Companies also acknowledge that there are customer segments (such as high usage customers, customers with plug-in electric vehicles and solar customers) within the service territory that may have opportunities to take part in additional opportunities. As such, the Companies will provide targeted messaging to these customers that will revolve around additional opportunities to become involved in energy efficiency, third-party offerings, or other ways to save.

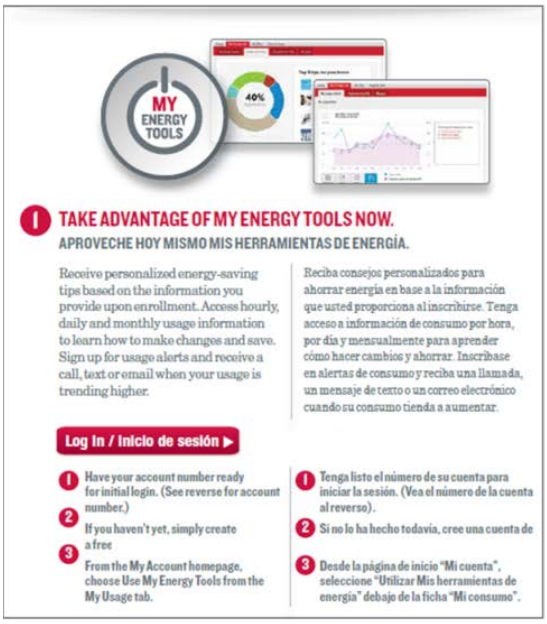
For example, high usage customers may benefit from the adoption of DERs to reduce their demand on traditional resources. The Companies will work so that these customers receive proper education about their AMI data and how shifting their load or responding to different pricing signals would provide them with the opportunity to save money. The Companies will engage with these customers through a wide range of channels.

Customer engagement will evolve over the course of the AMI deployment through lessons learned, surveys, focus groups, and a building of awareness across the service territory.

3.5.6 Engaged Phase Example Education Material

Consistent with each of the phases, each Company will design education materials aligned with successful examples employed throughout the industry that will be clear, simple, non-technical and available in multiple languages based on customer demographics. Figures 3-12 through 3-14 are presented as examples of hard copy education materials.

Figure 3-12 Example Post Installation Notification



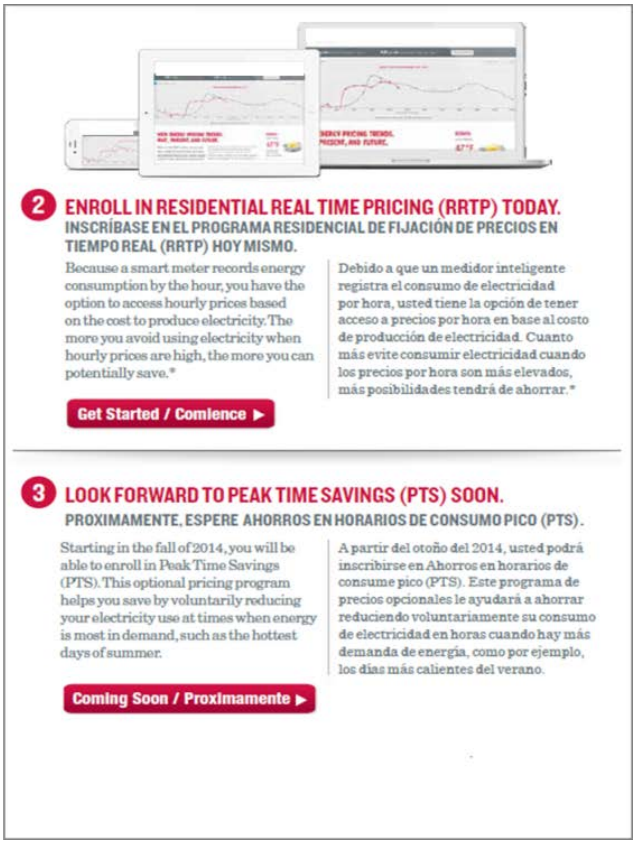


Figure 3-13 Example High Bill Alert

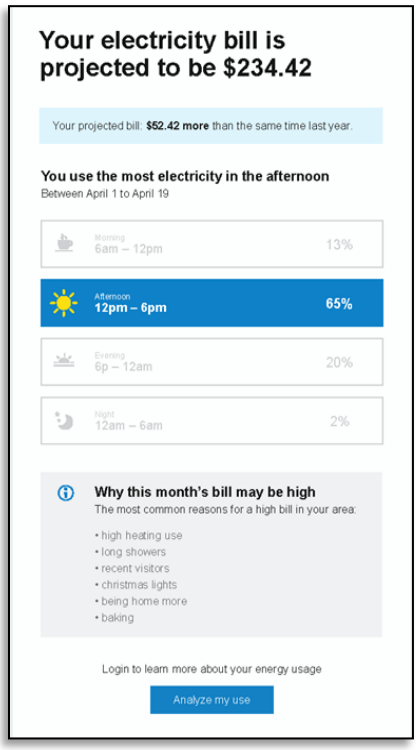
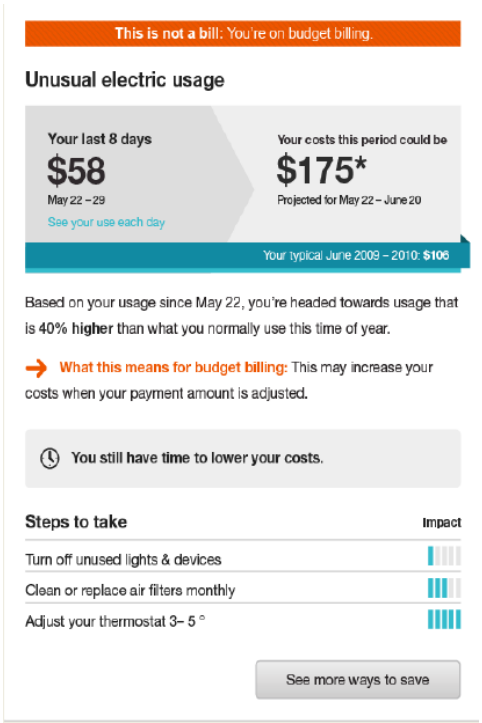
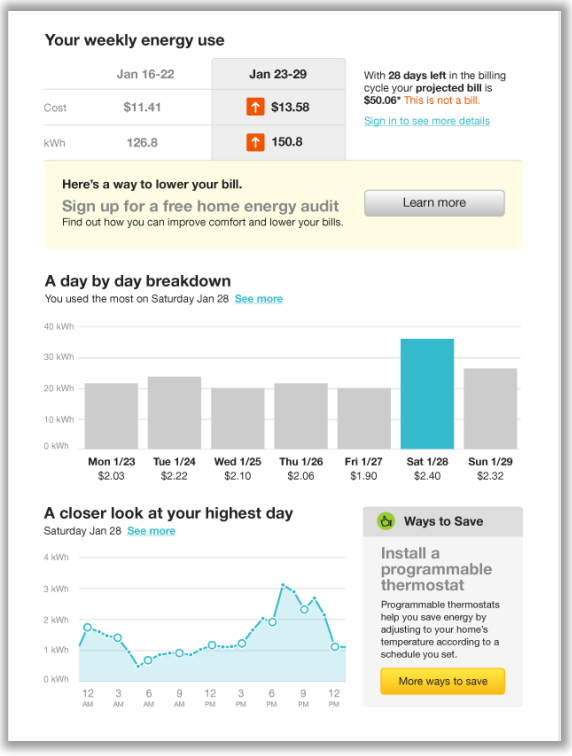


Figure 3-14 Example Energy Usage Reports





3.5.7 Engaged Phase Summary

The Engaged Phase continues to build upon the Aware and Informed phases, and provides customers with knowledge to participate in smart meter opportunities. Table 3-12 summarizes the range of activities for this phase.

Table 3-12 Engaged Phase Summary

Messages	Channels	Audience	Education Material
• Current smart meter benefits available to customers • How to engage with smart meter benefits • How to engage with third-party opportunities • Customer communication channel preferences • New services as they roll out	• Direct mail • Email • Community events • Social media • Load disaggregation bill messages • Tools: web, messaging (1) Hourly Data Presentment (2) Bill Compare and Forecast (3) Personalized Tips (4) Account Settings (5) Alerts (6) Rates Calculator	• Targeted Customers: (1) LMI (2) Non-English (3) Seniors (4) Non-digital (5) Housing type (6) Commercial type (7) Usage type (8) Plug-in electric vehicle (9) Solar	• Customized education report • Customized usage information and tools (website and alerts) • Informative material on smart meter offerings • Phone talking points • Benefits fact sheet (specific to offerings) • Spokesperson talking points • Website demo

3.6 Customer Education Metrics

In order to track customer participation and the behavioral changes described above, the Companies have defined metrics to evaluate their progress on improving customer awareness and engagement as they continue surveying and gathering feedback from customers. In April and June 2016, Con Edison and Orange and Rockland filed testimony updates[9,10] which included metrics to monitor the success of the AMI project. The Companies proposed metrics for customer engagement as they relate to awareness, education and outreach. Staff submitted testimony in May 2016,[11] which included metrics related to the online portal. These online portal metrics are also reflected within the O&R DSIP. The proposed metrics are presented in Table 3-13 and have not been formally approved by the commission and are subject to change.

The metrics will help determine whether customer education has been sufficiently clear and effective, measure customers' use of an online portal, and gauge the Companies' outreach presence.

[9] Case 15-E-0050, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Consolidated Edison Company of New York, Inc.'s Testimony Update Regarding Metrics for the Commission's Use to Monitor the Success of the Advanced Metering Infrastructure Project (filed April 21, 2016).
[10] Case No. 14-M-0101, Orange & Rockland's Initial Distributed System Implementation Plan (Filed June 30, 2016)
[11] Cases 16-E-0060 and 16-G-0061, Consolidated Edison Company of New York, Inc.'s Prepared Testimony of: Staff Advanced Metering Infrastructure Panel (Filed May 2016)

Table 3-13 Proposed AMI Customer Education Metrics

Service / Function	Metric	Description	Report Start Date (At end of quarter or specified)	Update Frequency
Awareness / Education	Customer Knowledge of AMI	Awareness survey related to AMI benefits and features	4Q2017	Semi-annual
Awareness / Education	Targeted Energy Forum Presentations	Number of presentations provided, Target 2 per year	4Q2017 (Con Edison) 4/30/2018 (Orange & Rockland)	Annual
Community Outreach	Number of community organizations contacted	Number of organizational events attended where information on AMI plan features and benefits would be provided	3Q2017	Semi-annual
Online Portal	Customers using the AMI Portal	Measure the percentage of customers with AMI meters that log into the online portal to view their usage information	4Q2017	Semi-annual
Online Portal	Customers Targeted with Energy Savings Messaging – All (Including Low Income)	Measure the percentage of customers that are targeted with messages on energy savings tools and tips, and personalized usage information	1Q2018	Quarterly
Online Portal	Real Time Data	Track the number of customers who have access to near real-time data once their AMI meters have been installed	3Q2018	Semi-annual
Green Button Connect	Customer usage of Green Button Connect My Data®	Track the number of customers who use Green Button Connect My Data® to share their energy usage information with third parties	April 30, 2018	Semi-annual

4 Green Button and Data Sharing

In the AMI Order, the Commission directed Con Edison to "develop a proposed implementation plan, budget and timeline for implementing Green Button Connect My Data® so that customers' usage data is available from a central portal using Green Button Connect My Data®." The AMI Order further states that "the proposed implementation plan shall be included in Con Edison's consumer engagement plan filing," and "in preparing the filing, Con Edison shall consult with ESCOs and DER vendors." During

collaboration with ESCOs, DER vendors, and other interested third parties, both Con Edison and Orange and Rockland concluded that the datasets currently offered through Green Button Connect My Data® do not meet the requests of third parties who wish to provide personalized services to customers. Consequently, the Companies propose a multi-phased approach to implementing data sharing that will extend the Green Button Connect My Data® capabilities.

Sharing customer usage data aligns with the goals of New York State's Reforming the Energy Vision (REV). Providing customers the ability to share usage data with third parties will increase opportunities for customers to make smarter energy use and investment decisions. This can result in better controlled costs and, as a result, environmental benefits. The accuracy and granularity of data available with AMI heightens the demand for data sharing capabilities.

The Companies have numerous channels that exist through which data is shared with third parties. These channels include Electronic Data Interchange (EDI), a Retail Access Information System (RAIS), and Green Button Download My Data® (DMD). EDI and RAIS data sharing mechanisms are intended for ESCO's to access customer information and usage data. As the Companies implement AMI and make access to additional data available to all third parties, utilities across the country have looked to a national data sharing standard, called Green Button, to accommodate these changing needs. Nevertheless, utilities have found that third parties would like to access datasets beyond those currently available through Green Button.

The following sections detail the Companies' multi-phased approach to addressing customers and third parties' data sharing needs. For phase one the Companies chose to implement Green Button Connect My Data®, due to its nationally recognized standard to transmit data from customers to third parties in a safe and secure manner. The plan, budget, and timeline to implement the standard are detailed in sections 4.1 and 4.2. For phase two the Companies will determine which additional datasets to implement based on third-party requests, updates to the Green Button standard, and the development of common data sharing standards in New York State. The approach for phase two is detailed in Section 4.3. Future phases may follow, depending on customer and third-party data sharing requests, changes to the Green Button standard, and new technological innovations. With all data sharing implementations, customers will control which datasets they share, and the third parties with whom they share those datasets.

4.1 Green Button Overview

Green Button launched[12] in 2012 as a national data sharing standard intended to provide customers with access to their energy usage data in a convenient and secure manner. Green Button Download My Data® (DMD) enables customers to download their own energy usage data and, if desired, upload it to a third-party application for analysis. Subsequently, Green Button Connect My Data® (GBC) was launched, which enhances the standard by automating continuous data sharing between customers and third parties.

[12] The U.S. Department of Energy (DOE), the National Institute of Standards and Technology (NIST), the Smart Grid Interoperability Panel (SGIP), the Utility Communications Architecture International Users Group (UCAIug), and the White House supported Green Button's launch. The North American Energy Standards Board's Energy Services Provider Interface (NAESB ESPI standard) provides a guide for Green Button technology. More information is available at www.greenbuttonalliance.org/about.

GBC provides a reliable protocol for customer authorization, data transfer, data formatting, and data exchange. The protocol leverages modern technical principles, including RESTful APIs, OAuth 2.0 authorization, and XML file formats. A third party who, for example, provides a smart phone application that enables customers to review their energy usage on-the-go, could register through GBC for data sharing approval. A customer who wishes to share his/her data with that third party could then log into the DCX portal, and authorize that third party to receive his/her energy usage data (customers can authorize third parties on a historical, ongoing, or temporary basis.). The Companies will then use a GBC API to automate the exchange of data between the utility systems and the third party that the customer authorized.

GBC standards enable the shared customer data shared to exclude customer personally identifiable information (PII), maintaining customers' privacy. The Companies are implementing GBC for a number of reasons. Using a nationwide standard protocol supports adoption by third parties who operate in multiple jurisdictions and are already capable of receiving data in the GBC format. The GBC data format and data sharing process is also consistent with, and complements, the Companies' new DCX platforms. And, most importantly, the GBC transfer process is secure and customer-driven. Overall, GBC will contribute to the enhanced customer service experience that AMI enables the Companies to offer.

4.2 Implementation Plan

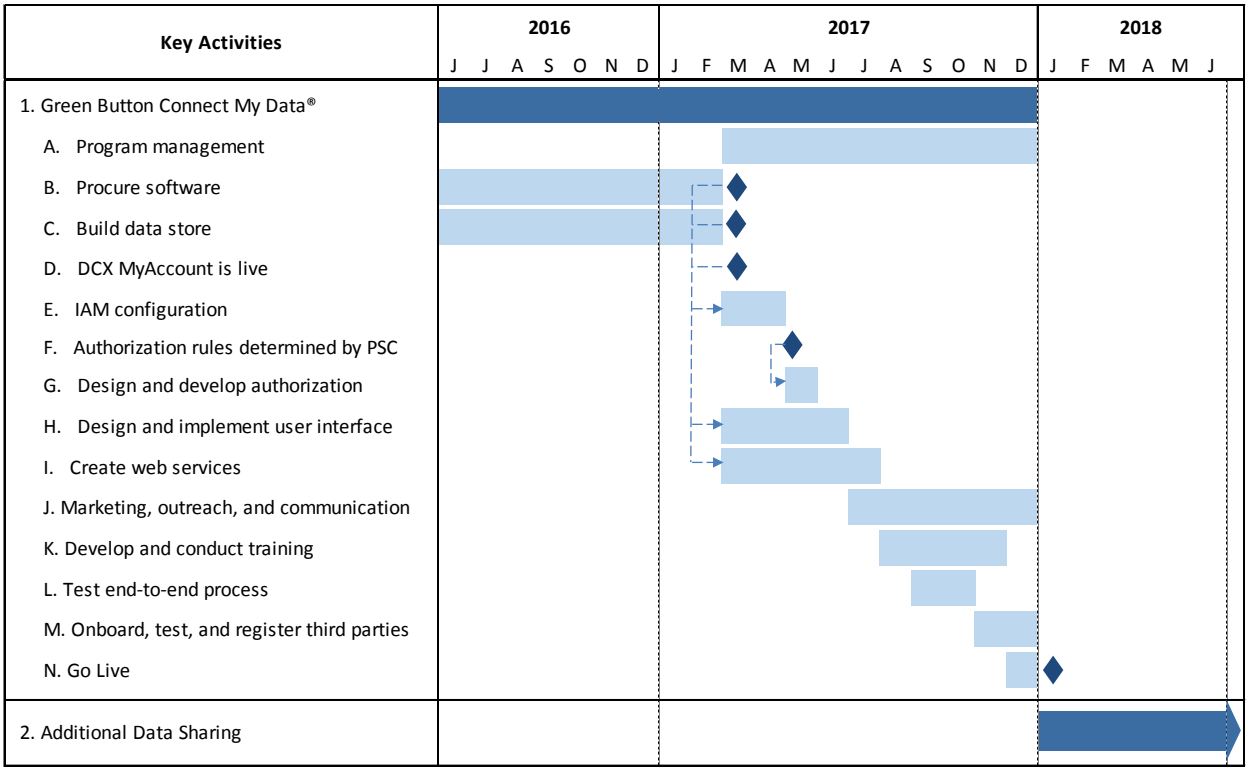
The Companies will implement GBC in phases. This follow best practices from other utilities who have implemented the standard, will help mitigate risk associated with the complexity of implementation, and allow future consideration of additional data sharing capabilities to complement the platform. In addition, a phased approach will allow the core GBC functionality of delivering usage data to third parties as soon as possible.

The first phase of the implementation focuses on the GBC standard, which includes the capability to view and share customers' energy usage data with third parties. Later phases will include capabilities to view and share additional customer data that customers, third parties, and the Commission deem valuable, and that the Companies are able to implement cost-effectively. Once GBC is launched, the Companies will begin phase two, revisiting third-party data sharing requests and reviewing the latest GBC functionality and New York State data sharing standards (see Section 4.3).

4.2.1 Timeline

The timeline for the Companies' data sharing implementation plan is illustrated in Figure 4-1. Phase one includes 14 key activities (lettered A through N) that will be conducted from June 2016 through December 2017.

Figure 4-1 Green Button and Additional Data Sharing Implementation Plan Timeline (dotted lines represent dependencies, diamonds represent milestones)



Phase one activities rely on efforts outside the scope of the technical development of GBC, and therefore dependencies are identified (see Figure 4-1). The first example of a dependency is for key activity G, "Design and develop authorization," which is dependent on the third-party eligibility rules that the Public Service Commission establishes. Staff has developed Uniform Business Practices (UBPs) that would be applicable to users of GBC, to which the Companies have submitted comments. Once the UBPs are approved by the PSC, activity G can commence. Key activity H, "Design and implement user interface," and key activity I, "Create web services," are dependent on the successful launch of the DCX My Account.[13] The successful execution of key activities A through I will enable the Companies to begin outreach efforts to customers and third parties (key activity J). This will include updates on implementation progress and identification of new capabilities that will be available when the GBC is launched.

Upon completion of phase one, GBC will become available to all customers through the portal component of the DCX. Customers who do not yet have AMI meters will be able to share monthly energy usage data with authorized third parties through the DCX MyAccount. As soon as a customer receives an AMI meter, GBC will enable the sharing of granular energy usage data.

[13] For additional information on the DCX program, including detailed budget and timeline descriptions, see Case 16-E-0060, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Direct Testimony of Customer Operations Panel (filed January 29, 2016).

4.2.2 GBC Implementation Plan Activities

In December 2015, the Companies developed a budget for phase one GBC that included a breakdown of GBC implementation activities. Benchmarking with utilities that have already implemented GBC and best practices from professional organizations with GBC experience informed the budget. As part of the development of the Customer Engagement Plan, the Companies refined the phase one GBC implementation activities, which are listed in the implementation plan (Figure 4-1) and described in detail below:

A. **Program management:** This activity includes monitoring task completion, tracking milestones, providing status updates, and coordinating DCX program implementation and AMI teams for a successful go live.

B. **Procure software:** The Companies must overlay the GBC services with software that provides analytics, throttling, versioning, and security functions associated with the APIs defined in the GBC standard. The execution of this activity enables key activities E, H, and I.

C. **Build data store:** The Companies must build a database to store interval energy usage data (and additional datasets in the future) that GBC will transfer to third parties. Building a new database rather than leveraging the Companies' existing systems will isolate the impact of the large volume of data sharing requests expected in the GBC environment, and is considered a best practice in GBC implementation.

D. **DCX MyAccount is live:** the DCX program will provide a platform on which to build the user interface in key activities E, H, and I.

E. **Identity Access Management (IAM) configuration:** The IAM solution will be configured to authorize third parties accessing the web services, and to allow customers to register and record authorizations to share their data via the OAuth 2.0 specification. The execution of this activity depends on the execution of activity B.

F. **Authorization rules determined by PSC:** The PSC will determine the rules by which third parties are eligible to receive customer data through GBC. The execution of this activity enables activity G. As mentioned above, the UBPs that would be applicable are still pending PSC approval.

G. **Design and develop authorization:** The Companies will update their websites with a registration process for third parties eligible for data sharing based on the rules the PSC defines in activity 6. The registration process will ensure that third parties meet eligibility criteria and have the technological capability to receive AMI data customers may share with them.

H. **Design and implement user interface:** For this activity, the Companies will create a front-end technology for customers and third parties to utilize GBC. The Companies must develop web content, documentation, the authorization interface (for customers), and the registration interface (for third parties). When determining the details of the user interface, the Companies will incorporate best practices provided by third parties during collaboration sessions.

I. **Create web services:** The Companies will create web services for usage data, along with a middle layer to manage and stage the data.

J. **Marketing, outreach, and communication:** The Companies will begin onboarding third parties to register for data sharing authorization six months prior to GBC go live, with the goal of having third parties approved and ready for customers upon go live. The Companies will focus their

efforts on third parties that express interest in being involved in early testing, and that have already met GBC authorization specifications in other jurisdictions. Additionally, the Companies will conduct marketing, outreach, and communication efforts with customers to inform them of the GBC process and security for sharing data.

K. **Develop and conduct training:** The Companies will train all internal staff members who interface with GBC, including Information Technology staff, Customer Operations staff, and call center teams.

L. **Test end-to-end process:** The Companies will test all components of the data sharing platform, both GBC and associated DCX capabilities, to verify the platform performs as planned.[14]

M. **Onboard, test, and register third parties:** Prior to and following launch of the data sharing platform (GBC and associated DCX capabilities full-time technical and business resources at the Companies will support third parties with demonstrations and connectivity testing.

N. **Go live:** The Companies will launch phase one of their GBC near the end of 2017.

Upon completion of these phase one activities, the Companies will be better positioned to consider additional data sharing capabilities that are requested, and will better understand the effort needed to enhance data sharing capabilities and further improve the customer service experience. This will inform the Companies' development of a phase two implementation plan, budget, and timeline to enable the sharing of additional datasets (see Section 4.3).

4.2.3 GBC Budget

As part of the analysis in development of the Plan, the Companies further examined the activity costs of phase one GBC implementation.[15] The budget revisions are depicted in Figure 4-2.

[14] The Con Edison cyber security team will conduct a security scan of all new code that is accessible via the internet.

[15] For additional information on the DCX program, including detailed budget and timeline descriptions, see Case 16-E-0060, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Direct Testimony of Customer Operations Panel (filed January 29, 2016).

Figure 4-2 Green Button Connect My Data® Budget

Green Button Connect My Data®	*Initial* Capital	*Updated* Capital	*Updated* Annual O&M
1. Program Management	$1,500	$683	-
2. Procure internal hardware	$500	$400	$80
3. Procure software	$3,000	$1,000	$400
4. Build data store	$3,000	$1,175	$370
5. DCX goes live	-	-	-
6. IAM configuration	$500	$500	-
7. Authorization rules determined by PSC	-	-	-
8. Design registration and authorization process	$500	$500	-
9. Design and implement user interface	$1,050	$1,050	-
10. Create web services	$1,000	$1,000	-
11. Marketing, outreach and communication	$300	-	-
12. Develop and conduct training	$250	$250	-
13. Test end-to-end process	$800	$800	-
14. Onboard, test and third-party registration	$150	$150	$350
15. Go Live	-	-	-
Total Direct Cost:	**$12,550**	**$7,508**	**$1,200**
Contingency:	$2,510	$1,493	-
Total Cost:	**$15,060**	**$9,000**	**$1,200**

The specific changes include:

- Software costs (3), initially estimated to be an upfront capital (purchasing) cost have been shifted to a subscription cost after the Companies reviewed the market and decided to pursue a software-as-a-service (SaaS) model for the product on a yearly basis. In addition, Green Button software needs are shared by the AMI program, allowing the Companies to remove software costs from the Green Button budget that have already been purchased with the AMI budget. The net effect of these changes is a reduced capital cost, and the addition of an operations and maintenance ("O&M") expense.
- Data Store capital costs (4) lowered due to shared data storage needs with the AMI program. The costs to build a data store (labor, hardware, and software) were initially budgeted assuming a new data store specific to Green Button would need to be built. The Companies have since determined that the data store being developed as part of the AMI program should meet the needs of Green Button Connect.
- Additional O&M costs to support onboarding, testing, and ongoing support activities (14) were identified through benchmarking and lessons learned from other companies.
- Program management and contingency costs decreased due to reduced capital cost of GBC implementation. For example, the program management and contingency costs for building a data store will be covered in the AMI program's budget.

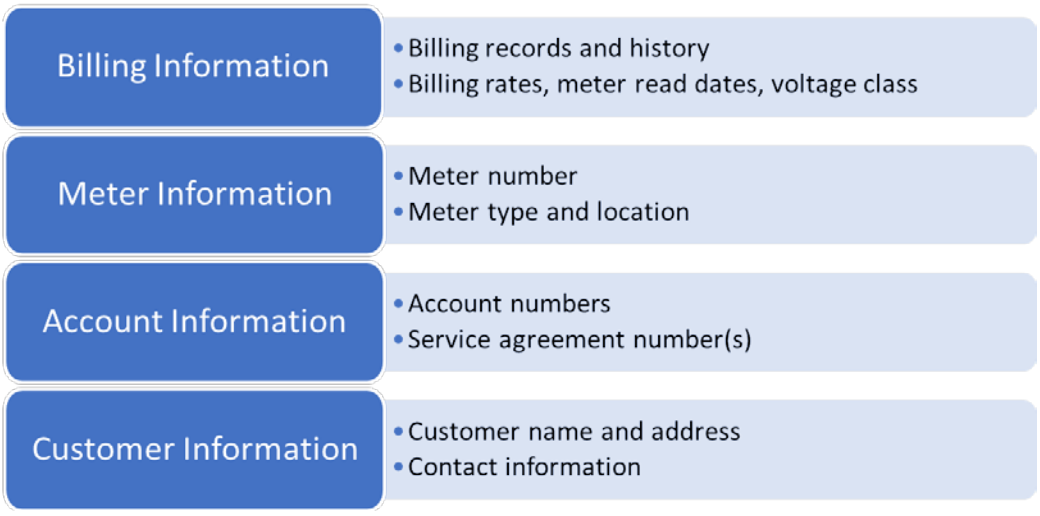
Considering these changes, the final budget amount is now $9.0M in capital costs, with annual O&M costs of $1.2M. These O&M costs will go toward maintaining the procured hardware and data store is maintained, together with funds for annual software maintenance and service fee costs, and resources for onboarding, testing, and ongoing support. These budgets are inclusive of Orange and Rockland's required capital and O&M costs, which will be segregated according to the shared service model (7.3% of cost). The Companies include contingency in the budget to account for level of estimation certainty based on their standard procedures on estimating projects.

4.3 Additional Data Sharing Capabilities

The Commission's AMI Order also requests Con Edison conduct "stakeholder engagement…to determine the specific customer data that is made available by AMI, which should be made available to customers and third parties through Green Button Connect My Data®…"[16] To discuss sharing datasets beyond those currently provided by Green Button, the Companies collaborated, as discussed in Section 1, with stakeholders on a "range of datasets and other parameters regarding data delivery."

Although Green Button Connect My Data® provides an effective platform for securely sharing customer data with third parties, it is still evolving. Green Button does not currently address third parties' data sharing requests for bill cost data, tariff data, account information, bill component data, and customer information. To understand how other utilities are addressing third-party requests, the Companies benchmarked with Pacific Gas and Electric ("PG&E"), San Diego Gas and Electric ("SDG&E"), Southern California Edison ("SCE"), Commonwealth Edison ("ComEd"), and the Green Button Alliance. Figure 4-3 shows the additional datasets (beyond usage data) that some utilities provide to third parties on their data sharing platforms.[17]

Figure 4-3 Data Available to Third Parties at Other Utilities



[16] Case 15-E-0050, *Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service*, Order Approving Advanced Metering Infrastructure Business Plan Subject to Conditions (issued March 17, 2016) (AMI Order).

[17] Some of these datasets have recently been adopted under the GBC standard as a new customer schema, but that is not the version that Con Edison is currently implementing.

Through discussions and benchmarking with peer utilities and the Green Button Alliance, the Companies learned that a phased approach to implementing additional datasets is preferable for two main reasons:

1. Providing multiple datasets requires the synchronization of many systems, which can be taxing and complicated. Implementing a phased approach alleviates complications with making multiple datasets available, and allows for usage data to be available at a sooner date, satisfying third party needs more quickly.
2. The Green Button standard is still evolving. By implementing many datasets at once, the Companies and third parties risk building out data sharing capabilities that may be inconsistent with future functionality of the Green Button standard.

In addition to these two reasons, there are six considerations that the Companies, officials, and third parties will need to address when implementing additional datasets:

- **Statewide Data Sharing Standard:** For each new dataset, all parties will need to align to a common data sharing standard for New York State. When determining the standard and defining additional datasets the Companies should seek to have as much consistency as possible with the New York State Utilities, as they continue to progress towards a single common standard. The Companies will state such data sharing standard in their Supplemental DSIP to be filed on November 1, 2016.
- **Governance:** A new governance structure for sharing additional datasets that outlines the responsibilities of the Companies, third parties, and customers that will need to be developed.
- **Privacy:** New privacy concerns arise with every new dataset that can be provided to customers and shared with new parties. Officials must ensure that regulations will protect customers' privacy as new datasets become available, and third parties must put the necessary technologies and practices in place to address customers' privacy concerns.
- **Liability:** As the sensitivity of new datasets increases, the liability for the Companies and third parties handling them will increase accordingly. The Companies and third parties will need to understand the governance structure in order to develop practices within their business to address their liability.
- **Technology:** Following adoption of a data sharing standard the Companies and third parties will need to develop, test, and implement new systems to gather, store, and transmit additional datasets. Additionally, the technology must support the privacy and liability concerns as defined in the governance structure for each dataset.
- **Cost:** The cost of implementing new data sharing capabilities includes additional investments for the Companies, as well as third parties. The appropriate financing for the implementation of new data sharing functionality must be determined, as well as any financial terms under which such data will be provided. Both the Companies and third parties must update their systems and policies to accommodate the new datasets.

To meet the needs of third parties' data requests while taking these six considerations into account, the Companies plan to implement additional datasets after first implementing GBC. Based on current feedback and analysis, at a minimum, the second implementation phase will enable bill cost data to be shared (bill cost data includes total cost of usage, but not the components of the cost or tariffs). Currently the Companies provide bill cost data to ESCOs through EDI. The ability to share bill cost data

will help third parties improve their services to customers, which in turn will help customers become more energy efficient. To facilitate customer choice and control, customers will have the ability to select which datasets they wish to share with a given third party.

The Companies will share a detailed phase two implementation plan in Q3 2017 to address the additional datasets requested during Collaboration, and to inform customers and third parties of the new capabilities they can expect. Phase two will kick off at the beginning of 2018. At that time, the Companies will have reviewed the latest features of the Green Button standard, and will have incorporated the Joint Utilities' progress on determining an approach to data sharing across New York State. The Companies will continue to benchmark with other utilities' data sharing implementations to inform the phase two implementation. The Companies will also continue considering requests from customers and third parties, and discussing plans for future data sharing implementations with the Joint Utilities and Green Button Alliance.

5 Innovative Rate Design

The AMI Order discusses the role of innovative pricing as part of the deployment of AMI in the following manner: "To maximize the benefits afforded customers through the introduction of AMI, innovative rate structures must be explored. Such rate designs may include demand-metered delivery rates, hourly supply pricing, peak rebate pricing, or other time- and location-sensitive designs." The AMI Order then provides the following direction: "The customer engagement plan is to include innovative pricing proposals, which should include one or more pilot programs, developed in consultation with stakeholders."

In addition, the O&R DSIP discusses the need to evaluate pricing alternatives to assist customers in achieving benefits from AMI, by stating, "AMI makes it possible to offer customers affordable opportunities to better manage their energy costs and, in the process, improve the economic efficiency of the electricity system by choosing and responding to prices that more accurately reflect the cost of electricity supply and delivery."

The Companies propose to conduct pricing pilots in their respective territories in conjunction with the approved AMI deployment schedules. The pilots will be conducted over two or more years as described in this plan using samples of customers with installed AMI meters.

The Companies will continue to develop many of the details for these pilots based on statistical analyses, evaluation of enabling technologies, and market research as described in the following sections. The Companies will consult with Department of Public Service Staff regarding any material changes in the pilots that result from these activities.

5.1 Pricing Pilots

5.1.1 Goal and Objectives

The goal of the Companies' pricing pilots is to identify how innovative rate structures can enhance customer benefits of the AMI system in a cost-effective manner. As described later in this section, the Companies have chosen to accomplish this by avoiding duplication of the many pilots that have been

conducted over the past two decades at other utilities across the country,[18] instead learning from them and drawing inferences from their results for applicability in the Companies' respective territories. The Companies' pilots will augment this knowledge base by focusing on an area of inquiry (i.e., rate structure) that has not previously been studied in any depth for application to residential and small commercial "mass market" customers.

This rate design plan discusses key findings that have been made by pilots previously conducted by other utilities and describes the research questions that remain unaddressed. It then lays out the basic elements of the Companies' pilots that will address these research questions.

There are three main objectives the Companies seek to accomplish with their pilots:

- gauge customer acceptance of alternative pricing for delivery service and their response to such prices, including changes in usage, peak demand, and total electricity bills;
- determine whether and how changing the pricing of delivery services will affect customer behavior (and thus their usage and peak demand) to drive more efficient use of the electric distribution system; and
- provide data and information that can help estimate the customer benefits resulting from alternative pricing of delivery service.

The pilot findings will be used to provide support in estimating customer benefits derived from the introduction of AMI. Moreover, the findings and lessons learned during the pilot will be used to inform future mass market rate design reform.

5.1.2 Organization of the Plan

Section 5.2 provides a summary of the pilots that have been conducted by a representative group of electric companies, identifies the gaps that exists in the research, and explains how the Companies' pilots will fill these gaps. This is followed by a discussion of the research design and evaluation framework that will be used to structure the pilots (Section 5.3), which includes essential components of the pilots such as rates and enabling technologies. Section 5.4 describes the locations and timeline for the pilots. After that Section 5.5 gives preliminary estimates about sampling and available participants based on the meter roll out schedule. Finally, Section 5.6 includes a detailed framework for education and outreach messaging through the pilot periods.

5.2 Lessons Learned and Remaining Gaps for Pricing Delivery Service

There have been many innovative pricing pilots conducted over the past 20 years by other electric utility companies. As described below, in conducting pilots in their territories the Companies will learn from these predecessor experiments and expand on them.

[18] For example, the Smart Grid Investment Program (SGIP), Customer Behavior Studies in Central Vermont Public Service to "Green Mountain Power" -eEnergy Vermont, Detroit Edison - SmartCurrents Home Project, FirstEnergy - Smart Grid Modernization Initiative, Lakeland Electric - Smart Metering Infrastructure Initiative, Marblehead Municipal Light Department - Residential Dynamic Pricing Pilot Project, Minnesota Power - AMI Behavioral Research, NV Energy -- Nevada Dynamic Pricing Trial of the Advanced Services Delivery Project, Oklahoma Gas and Electric - Smart Study TOGETHER, Sacramento Municipal Utility District - SmartSacramento Project, Vermont Electric Cooperative - eEnergy Vermont. For more information, see https://www.smartgrid.gov/recovery_act/overview/consumer_behavior_studies.html.

5.2.1 Summary of Previous Innovative Pricing Pilots across the Country

The Companies examined the design and results of ten well-documented pilots to determine patterns and other lessons learned; their characteristics and results are summarized in Table 5-1. Eight of these pilots (all except the California Statewide Pricing Pilot and the Commonwealth Edison Company pilot) were partially funded through the Smart Grid Investment Grant ("SGIG") as part of the American Recovery and Reinvestment Act of 2009 ("ARRA").

The pricing designs tested and the observed results are fairly similar among almost all of these pilots. Most of these pilots focused on some form of dynamic pricing or time-of-use ("TOU") rates including critical peak pricing ("CPP"), variable peak pricing ("VPP") and peak-time rebate ("PTR").

Most of the pilots included customer access to some form of technology, coupled with education and information, that helped customers understand their current consumption levels and patterns, the prices charged, and how they could decrease their bills.

Both opt-in and opt-out recruitment approaches were used in these pilots, with opt-in being the predominant approach. Sample sizes ranged from 500 to 8,000 participants, with the size indicative of the target population and the number of variables (such as types of prices, technologies and messaging) included in the respective pilot.

The results and findings from these pilots are quite similar. Almost all of them found significant customer response to price signals, with reductions in use ranging from 5% to over 40%. The higher end of this reduction range was usually associated with access to enabling technologies. Educational and informational messaging was also frequently found to be helpful to customers.

Given the pilots conducted and their respective results, there is little need to replicate what has been repeated numerous times as the lessons learned are generally transferable and scalable. Time-differentiated prices can lead to changes in customer load and consumption.

There is more to be learned, however. Since these ARRA pilots were designed, the landscape of the electric utility industry has continued to evolve toward a modernized power grid that is increasingly clean, efficient, and adaptable in order to integrate resources in front of and behind the meter. In New York, traditional rate design evolved in an era before modern information technology was available. With the deployment of AMI to mass market customers, they will have information about and potential to control the true components of costs.

The Companies' focus is on providing cost-effective delivery service to this evolving, modernized grid. As such, these pilots will test customer acceptance of a new form of mass market demand-based delivery rate design which sends price signals that are better aligned with delivery costs. More information will provide customers the opportunity to effectively respond to price signals and drive efficient use of the grid, in turn enabling reductions of total distribution system costs in the long run.

While different than the previous pilots described, insight from them will help the Companies conduct a pilot that is fairly simple in design when compared to the others that have been conducted over the last 20 years. However, from this simplicity comes a focus on some key areas of inquiry as the industry transitions to an integrated electric grid. The Companies' pilots will focus on the best way to price access to the network for mass market customers with interval metering capabilities.

5.2.2 Demand-Based Delivery Rates

Delivery system costs are the result of customer demand, but mass market customers are currently billed for delivery service primarily on a volumetric basis. In the past, electric utility companies assumed that mass market customers were fairly homogeneous groups with similar demand characteristics. Therefore, these customers have historically been billed volumetrically to avoid the expense of demand metering. Also, mass market customers' electricity consumption was previously assumed to be fairly inelastic, so pricing on a volumetric basis was not believed to produce inefficient changes in behavior or technology adoption.

Today, however, customers have more options (e.g., DERs, energy efficiency, smart appliances, and electric vehicles) and demonstrate less homogeneity and greater price elasticity than they did in the past. Such being the case, inefficient pricing of electric service may now promote inefficient alterations in customer behavior and the pursuit of uneconomic alternative technologies. For example, under today's mainly volumetric rates, certain technologies (such as DERs or DG) can significantly reduce a residential customer's delivery service bill while doing much less to reduce underlying delivery system costs. Responsibility for these costs is then shifted to other customers, creating a cross-subsidy. However, through their AMI initiatives, the Companies are on a path to much more sophisticated (interval) metering that will enable rate designs that more accurately reflect the cost of delivery service.

Since customer demand rather than volumetric usage drives delivery system costs, the Companies will test demand-based rates for mass market customers.

Demand-based delivery rates collect delivery costs on the basis of kW demand instead of the current approach, which collects most of the costs on a volumetric (kWh) basis. Demand-based rates can be designed in a number of ways. For example, demand can be measured based on:

- the customer's maximum kW use during each month,
- the customer's maximum kW use during a specified (peak) period(s) each month,
- the customer's maximum kW use during a year, or
- the customer's kW use during the system peak of the year.

There are a number of positive attributes associated with demand-based rates:[19]

- Demand-based rates result in an allocation of distribution costs based on the facilities required to meet each customer's requirements of the grid during a specific period of time.
- Demand-based rates encourage higher customer load factors and better utilization of the system.[20]

[19]For discussions of the attributes of demand-based rates, see *Recovery of Utility Fixed Costs: Utility, Consumer, Environmental and Economist Perspectives* - June 2016 Lisa Wood (Institute for Electric Innovation) and Ross Hemphill (RCHemphill Solutions), John Howat (National Consumer Law Center), Ralph Cavanagh (Natural Resources Defense Council) and Severin Borenstein (UC-Berkeley).

[20] See Ryan Hledik, "Rediscovering Residential Demand Charges," The Electricity Journal, Vol. 27, Issue 7 (Aug/Sept 2014), pg. 84. Also see Ross C. Hemphill and Kenneth W. Costello, "Regulators Can Win the Trifecta with Residential Demand Charges," *Public Utilities Fortnightly*, Vol. 154, No. 7 (July 2016), pg. 33.

- Demand-based rates are consistent with a longstanding method of allocating distribution facility costs across the different classes of customers.[21]

Demand-based rates have been used for commercial and industrial customers for decades. They have generally not been applied to residential and small commercial customers due to the lack of economical demand metering capability. A handful of utilities have optional demand charges for residential customers,[22] and a few utilities are now proposing a demand charge as part of a three-part rate (i.e. a fixed charge, a demand charge, and an energy charge) for DG customers. However, little is known about the response mass-market customers will have when placed on a demand-based delivery rate. This is why the Companies are focusing on this approach in the proposed innovative rate design pilots.

Table 5-1 Previous Pricing Pilots Selected for Review[23]

Pilot	Tested	Findings
CA Statewide Pricing Pilot (three utilities)	• Rates: TOU, CPP, and VPP • Enabling technology variable • Opt-in, 2,500 customers	• TOU reductions of 5% • CPP and VPP reductions 25% with enabling tech; 10% without
Commonwealth Edison Co.	• Rates: TOU, Real Time Pricing ("RTP"), CPP, PTR, Invert • Enabling technology variable • Opt-out, 8,000 customers	• No statistical difference across groups • 10% responded to RTP, CPP, and PTR, with up to 20% event reduction
First Energy Illuminating Co.	• Rates: PTR • Enabling technology variable • Opt-in, 976 customers	• Event reductions of 8-30% with enabling technology
Green Mountain Power	• Rates: CPP and PTR • Enabling technology variable • Opt-in, 3,735 customers	• PTR showed no statistical event response • CPP ranged 11%-14%
Marblehead Municipal Light	• Rates: CPP • Enabling technology included • Opt-in, 532 customers	• Event reductions ranged from 21%-37%
Oklahoma Gas & Electric	• Rates: TOU, CPP, and VPP • Enabling technology variable • Opt-in, 4,500 customers	• Significant results across all treatments • Reductions of 19%-30%, with VPP resulting in largest reductions

[21] A description of the process of allocating distribution facility costs by coincident and non-coincident demand can be found in National Association of Regulatory Utility Commissioners (NARUC). 1992. Electric Utility Cost Allocation Manual. Washington, D.C.: NARUC.

[22] Utilities that offer voluntary demand rates to residential customers include: SRP (AZ), Arizona Public Service – APS(AZ), Black Hills (SD & WY), Duke (NC & SC), Dominion (VA & NC), Georgia Power, Alabama Power, Xcel Energy, and Alaska Electric Light & Power Company.

[23] Unless otherwise stated, these are ARRA Smart Grid Investment Program, Customer Behavior Studies. Reports available at: https://www.smartgrid.gov/recovery_act/overview/consumer_behavior_studies.html. (ARRA Studies).

Table 5-1 continued (Previous Pricing Pilots Selected for Review)

Pilot	Tested	Findings
Sacramento Municipal Utility District	• Rates: TOU and CPP • Enabling technology variable • Opt-in (7,880 customers) and Opt-out (2,046 customers)	• Opt-in TOU 10%-13% reduction • Opt-out TOU 6%-8% reduction • • Opt-in CPP 22%-26% reduction • Opt-out CPP 12%-13% reduction • Enabling technology produced higher reductions for all
DTE Energy	• Rates: TOU with CPP overlay • Enabling technology variable • Opt-in, 1,915 customers	• Reductions ranged from 12%-44% on event days (depending on enabling technology)
NV Energy (two utilities)	• Rates: TOU, CPP, & VPP • Enabling technology variable • Opt-in, 7,440 customers	• Reductions ranged from 19%-36% in the South and 7%-39% in the North • Enabling technology yielded insignificant results
Vermont Electric Cooperative	• Rates: TOU with VPP overlay • Opt-in, 3,500 customers	• Reductions for TOU: 1%-5% • Reductions for VPP: 15%-20%

5.3 Research Design and Evaluation Framework

5.3.1 Essential Components

The Electric Power Research Institute ("EPRI") provides a framework for conducting pricing pilots, stating that the design and evaluation of a pilot should include six fundamental components: (1) research questions, (2) reference load model, (3) validation of the reference load model, (4) estimation of load impacts, (5) estimation of consumer demand models, and (6) clear reporting of the results.[24]

5.3.1.1 (1) Research Questions

The identification of the research questions is necessary to specify:

- What is to be learned from the pilot?
- What are the expected results in terms of customer behavior?
- What are the implications be sought through these results?

[24] Quantifying the Impacts of Time-Based Rates, Enabling Technology, and Other Treatments in Consumer Behavioral Studies – Protocols and Guidelines, EPRI: Palo Alto: CA: 2014. 3002000282.

5.3.1.2 (2) Reference Load Model and (3) Validation of the Reference Load Model

The reference load is an estimate of the usage behavior that would have been exhibited by the customers if they had not been placed on the different pricing structures, given access to enabling technologies, or received educational messages. This is sometimes referred to as the counterfactual load as it is an attempt to move the clock back to determine what the loads would have been for identical customers in the sample, but without being subjected to the alternative pricing structures. Validation of the reference load model is an essential component as it provides the confidence that changes in customer behavior are properly being measured against the status quo.

5.3.1.3 (4) Estimation of Load Impacts and (5) Consumer Demand Models

Estimating the load impacts and response rate with confidence intervals requires a statistical analysis to determine magnitude of change in customer load and tests of significance to establish that the change is due solely to the different pricing structures. Consumer demand models are needed to apply the results from the study to a range of prices in the future. The load impacts observed during the pilot are responses to price signals provided to customers at that point in time (when the pilot occurred). It is likely that future applications of the pricing structures will have different price levels. Demand models, developed by the research team using the results of the pilot, provide price elasticities that allow for interpolation of results across a range of prices.

5.3.1.4 (6) Clear Reporting of the Results

Proper documentation of the pilot design, process, and analysis of results is essential for the entire exercise to be understandable and useful to a broad range of interested parties.

5.3.2 Research Questions and Hypotheses

With demand-based delivery rates, there are four potential outcomes the Companies are trying to test:

1. if customers will reduce their demand during the peak period in response to the demand pricing signal,
2. if customers will shift usage from the peak to off-peak periods,
3. if customers will understand and accept new rate structures, and
4. if customers will improve their monthly load factors.

Answering each of these questions will assist in achieving the first objective of the pilot. The data gleaned from these will assist in estimating what benefits will result from a full application of the pricing program.

In addition, the Companies will qualitatively evaluate whether currently available enabling technologies enhance the response of customers to demand-based rates. The Companies will further use surveys to qualitatively evaluate the effectiveness of outreach efforts on education and information to assist customers in benefiting from the trial delivery pricing plans.

5.3.3 Design Elements

There are three elements of the pilot design. They will be: (1) pricing of delivery service, (2) enabling technologies, and (3) education and outreach. The effect of the pricing of delivery service options will be quantitatively measured and evaluated to determine results the pilot. Customers in treatment groups (see Section 5.3.6 for definitions) will get the benefit of access to enabling technologies and messaging. The effectiveness of these will be determined qualitatively through surveys and interviews throughout the pilot process.

5.3.4 Price Structures Included in Pilots

This section describes the prices that will be used in the pilots.

5.3.4.1 Status Quo Prices

Control group (see Section 5.3.6 for definitions) participants will remain on their currently effective tariff rate for delivery service and the same price level and structure in which they purchase electricity supply. The currently effective delivery rates for most residential customers are contained in Service Classification No. 1 (SC-1) for the Companies. For small general service non-demand billed customers, the currently effective delivery rates are contained in SC-2 for the Companies.[25] Note that SC-2 customers will not be part of the pilot in Rockland County since there are not enough of them to conduct a statistically valid pilot (see Section 5.5.3.3).

The SC-1 and SC-2 delivery rates of both Companies consist of a fixed monthly customer charge and a volumetric charge for each kilowatt hour (kWh) of usage. The status quo supply prices for all customers are those currently in effect by the Companies, if full service, or as specified in the service contract if purchasing supply from an ESCO. To the maximum extent practicable, ESCO prices will need to be tracked as part of the pilot to assure that any changes in supply price are incorporated in the evaluations of changes in energy usage and demand.

5.3.4.2 Demand-Based Delivery Rates

Delivery rate structures for commercial and industrial ("C&I") customers typically consist of a fixed monthly customer charge, a demand charge, and a small volumetric charge ("conventional demand rate structure"). The Companies plan to test two demand-based delivery rate structures for mass market customers. The first of the demand rates will be based on a conventional structure. The second rate under consideration is a demand-based subscription service as described below or an alternative to the conventional demand rate structure, the details for which will be developed based on initial customer research. As the pilots are further developed, Orange and Rockland may decide to test only one of these rates given the limited number of customers available for the pilot in Rockland County and cost constraints.

The conventional demand rate structure would be available for customers chosen to be in the pilots (via the opt-in and opt-out recruitment process described in Section 5.3.7). These customers will need to have an installed and functioning AMI meter with two-way communication between the customer and

[25] For Con Edison, SC-2 is comprised of both metered and un-metered customers. For purposes of this pilot, Con Edison is targeting its SC-2 metered customer population.

the utility. Selected customers in the AMI deployment footprint will be eligible to participate with this rate design regardless of whether they purchase energy supply from the Companies as full service customers or from an ESCO.

Customer research will inform certain aspects of the conventional demand rate structure for mass market customers including:

- whether the rate is based on coincident peak (Distribution, Transmission, or System) or non-coincident peak demand,
- the demand measurement interval (e.g., 15 minutes, 30 minutes, 1 hour),
- the number of peak demand measurements included in billing calculation for a given period,
- the seasonal rate differential, and
- the portion of delivery revenue recovered through demand charges.

The second variation on the demand-based rate structure that will be explored for Con Edison (and possibly Orange and Rockland) during the pilot process is the demand subscription service, a concept for pricing delivery services that may work well with the consumer of the future, and hence, the utility of the future. Consumers are already familiar with the concept of subscription service through other industries, such as cell-phone pricing plans. Demand subscription service "allows consumers to choose different levels of demand."[26] Subscription service results in customers pre-designating their demand level with the ability to increase their demand level if necessary. This may work well with DER customers in particular. Customers that have DER installed capabilities can pre-subscribe to the level of delivery capacity they anticipate requiring during a designated period of time and then increase their demand level if necessary. [27]

5.3.5 Enabling Technologies

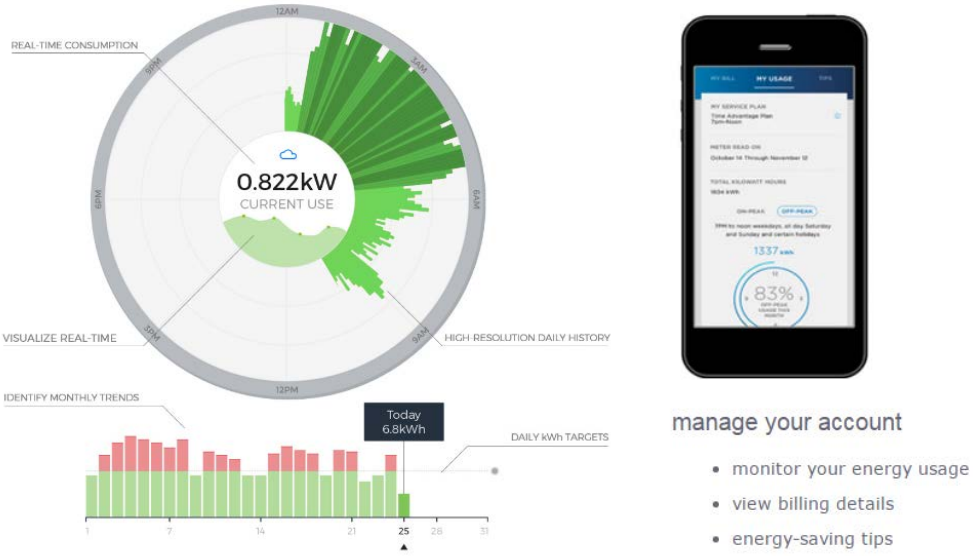
The Companies will provide information about or access to enabling technologies to treatment group (see Section 5.3.6) participants in the pilot to provide them with information about their electric usage and help them identify opportunities to save money (lower their bills) and better match their usage with the capacity of the grid while on the pricing treatments. The goal of introducing enabling technologies in this pilot will be to understand how customers respond to and accept rates and technologies together. The specific format that the provision of or information about technology will take is still being developed. As evidenced by the majority of the innovative pricing pilots listed in Table 5-1, enabling technologies frequently served to enhance the customer experience and led to greater price response to the rate structures being tested. These technologies have usually included programmable communicating thermostats ("PCTs") for customers with central heating, ventilation, and air conditioning ("HVAC") systems and various means of communicating prices and loads to the customers that inform them about immediate opportunities to reduce their bills. These communications have most often been provided via in-home displays ("IHDs").

[26] Hung-po Chao, "Price-Responsive Demand Management for a Smart Grid World," Electricity Journal, Vol. 23, Issue 1 (Jan./Feb. 2010), Pg. 17.

[27] If the subscription service is not included in the pilot, then another variation of the demand charge will be tested for Con Edison customers.

Most companies that offer voluntary demand rates to residential customers recommend traditional technology, such as PCTs and IHDs.[28] There are, however, technologies in development that may be more effective in helping mass market customers manage demand-based rates. Arizona Public Service ("APS") has recently introduced a smart phone app that customers can use to monitor their usage, but it is still only capable of providing information with a day behind lag.[29] Another type of enabling technology with potential for customers on demand rates is the demand controller offered by Black Hills Power. This is a system that controls deferrable loads such as electric heaters, heat pumps, air conditioners, and water heaters through a wall-mounted unit that allows the customers to avoid high demands at particular times of the day.[30] A third potential option is offered by Powerly, a home energy management platform that grew out of the DTE pilot (see Table 5-1), which allows customers to monitor their usage in real time.[31] Finally, Bidgely offers a tool that can be used to engage customers and distribute messaging, while it also "itemizes consumers' whole house energy data into individual appliances - without any sensors" using algorithms.[32]

Figure 5-1 Technology Examples from Powerly[33] and APS[34]



The Companies will continue to investigate these and other technologies that have the potential to benefit customers on demand-based rates in designing the pilot, potentially including those that are found to be ready for wider distribution. At the very least, participants will be encouraged to take

[28] Utilities that offer voluntary demand rates to residential customers include: SRP (AZ), Arizona Public Service – APS (AZ), Black Hills (SD & WY), Duke (NC & SC), Dominion (VA & NC), Georgia Power, Alabama Power, Xcel Energy, and Alaska Electric Light & Power Company.
[29] APS. "Mobile App" at https://www.aps.com/en/residential/accountservices/Pages/mobile-app.aspx?src=rhome.
[30] See http://www.blackhillsenergy.com/save-money-energy/demand-controllers/demand-controller-equipment.
[31] Powerly. "Our Story" available at http://www.powerley.com/about/.
[32] See http://www.bidgely.com/technology/ for details.
[33] Powerly. "Platform" available at http://www.powerley.com/platform/.
[34] APS. "Mobile App."

advantage of the existing programs and technology made available by the Companies.[35] Regardless of the enabling technologies that are ultimately selected, all will be available to participating customers in treatment groups. Moreover, all customers (in and out of the pilots) will have access to the Companies' DCX program described in Section 3.5, which will include data on a day-behind basis through the end of 2017, mobile-accessible data starting in 2017 (with possible access to a dedicated mobile app for pilot participants), and 30-minute lag data starting in 2018. The use and success of enabling technologies will be evaluated qualitatively via survey, with the possibility of comparing usage amongst users within the same groups that express different levels of engagement.

In most cases, the Companies will not provide the technology outright. The main exception to this would be customers in treatment groups (particularly those in opt-out pilots) that do not have access to smart phones, internet, or other personal devices that would hinder their ability to monitor their energy usage. Those customers may be offered an IHD or similar technology so that they have access to similar enabling technology and capabilities. For other groups, incentives and rebates for use of enabling technologies will be considered; they will receive educational materials and messaging about options and how they can be used to manage demand.

5.3.6 Randomized Encouragement Design[36]

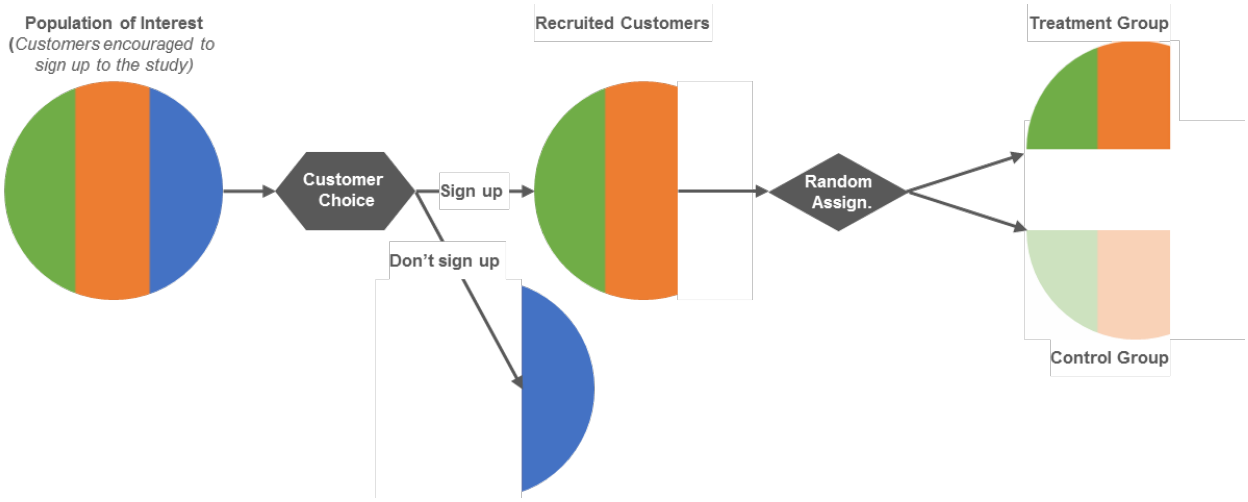
In experimentation exercises, where the researcher is looking for a cause and effect relationship, there must be a control group and a treatment group. The two groups must be identical except for the stimulus (or treatment) applied to the second group. In studies looking at pricing behavior, the different pricing structures are treatments applied to the non-control groups to determine their response in terms of demand and usage as compared to those in the control group.

A randomized control trial ("RCT") requires that subjects from the targeted population be randomly selected and assigned to a treatment or control group. The theory behind this approach is that scientifically derived samples of customers must be required to participate in the experiment in order for the results to allow for inferences to how the population would react if they were all faced with the same situation (such as the same electricity pricing structures). In other words, in order for an experimental design to be a true RCT, the customers in the sample must be assigned to the pricing plan. This eliminates the need to correct for the self-selection bias present with allowing customers to opt-out and opt-in of experiments (as shown in Figure 5-2). The only way to truly accomplish this is through a mandatory process, however, and such an approach would likely be unpopular with any customer base. Therefore, it does not appear to have been applied in its purest form in any prior pilots.

[35] See Con Edison, "Energy Efficiency" at http://www.coned.com/energyefficiency/default.asp. O&R offers a similar BYOT Program with smart thermostat enabling technology. O&R saturation of Room ACs is much less than Con Edison's, so they are not concentrating on Smart AC but rather central air cycling. O&R is further considering cycling of electric water heater and pool pumps.

[36] For a complete discussion of the recruitment approaches, see *Quantifying the Impacts of Time-Based Rates, Enabling Technology, and Other Treatments in Consumer Behavior Studies - Protocols and Guidelines*, EPRI: Palo Alto, CA: July 2013. 3002000282. Also see *Understanding Electric Utility Customers -- 2014 Update: Review of Recent Studies*. EPRI, Palo Alto, CA: 2014. 3002001268.

Figure 5-2 Randomized Control Trial Diagram[37]



Recruit with delay or denial is a variation on the RCT that avoids the need to mandate participation by the customers. Using this approach, customers are first recruited to participate and then the self-designated volunteers are assigned randomly to different treatment or to control groups. Customers may opt-in or out of participation once they learn all the specific terms of the pilot. This approach is viewed as creating robust results although inferences are limited to likely volunteers in the larger population.

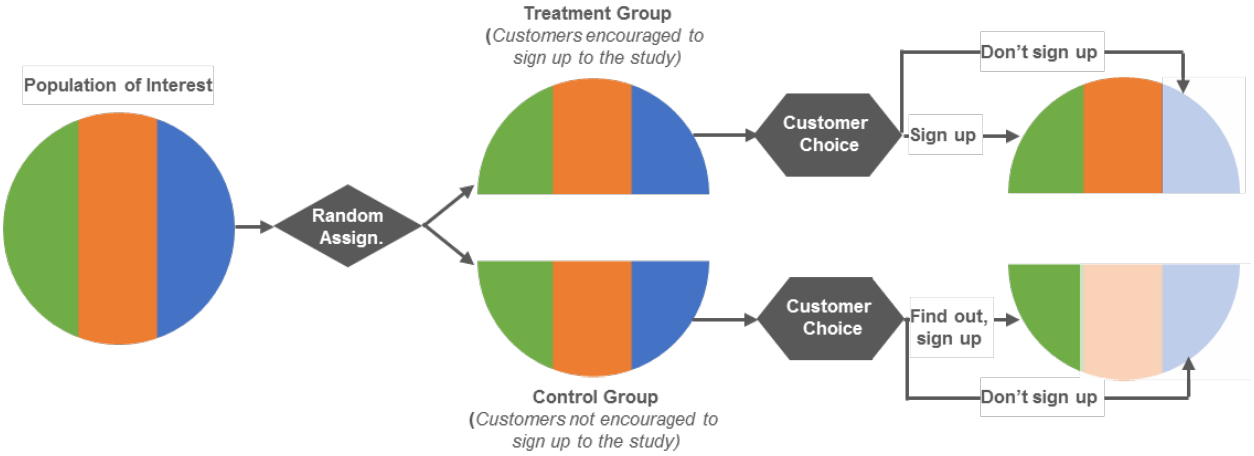
In opt-in pilots there is also a danger that proactive customers that want to try new rates will be disappointed with their assignment to a control group, skewing their behavior or feedback on pilot surveys and impacting their overall satisfaction with the utility. Delay or denial techniques have been used as a means to counteract this as well.[38] In delay, participants in the control group receive a message that they will have the opportunity to enroll in the new rate, but only after a certain period has elapsed. During that waiting period, they serve as the control group.[39] Denial, on the other hand, informs these participants that they will not be assigned to any of the new rates. [40]

Another variation on the RCT is the randomized encouragement design ("RED"). This approach starts out like a pure RCT where customers are randomly assigned to different groups ahead of any recruitment. Customers are then encouraged to participate through extensive information and education outreach. The limitations on scalability to the larger population are similar to recruitment with delay or denial. Both will require a level of oversampling to assure sufficient participation is accomplished to achieve statistically significant results. Many of the pilots previously conducted in the electric utility industry

[37] Adapted from Quantifying the Impacts of Consumer Behavioral Study Experiments and Pilots: Protocols and Guidelines. LBNL, Berkeley, CA and EPRI, Palo Alto, CA: 2013. LBNL-6301E, Pg. 16.
[38] Quantifying the Impacts of Time-Based Rates, Enabling Technology, and Other Treatments in Consumer Behavior Studies: Protocols and Guidelines. Pg. 2-15. EPRI, Palo Alto, CA: 2013. 3002000282.
[39] Pilot that used delay: Oklahoma Gas & Electric, Marblehead Municipal Light, SMUD, Lakeland Electric, and Minnesota Power.
[40] For denial example, see Vermont Electric Cooperative, available at https://www.smartgrid.gov/project/vermont_transco_llc_eenergy_vermont.html.

used some variation on the RED[41] recruitment process (see Figure 5-3), and the Companies intend to follow the RED approach as well.

Figure 5-3 Randomized Encouragement Design Diagram[42]



5.3.7 Use of the Opt-In and Opt-Out Recruitment Processes

Both opt-in and opt-out recruitment processes will be used in the pilots. With opt-in recruitment, the randomly chosen customers are encouraged to respond affirmatively with their intention to participate in the pilot. With an opt-out, the randomly chosen customers are informed of their selection for the pilot and instructed to respond to the Companies if they do not want to participate. In an opt-out process, a non-response is taken as a willingness to participate. The Companies plan to communicate to customers in a clear, consistent manner, so that to the maximum extent possible, those that do not wish to participate are aware of the action that they need to take (see Section 5.6 for more detail on outreach, including messaging for opt-out participants).

Opt-in and opt-out enrollment will each provide different and important insights. Because much needs to be learned about the most effective recruitment techniques, and demand-based rates are new to residential (SC-1) customers, the Companies will use only the opt-in approach during the first phase of the pilots. This will allow the Companies to build success and gain experience with volunteer customers in the process. This early insight will then be used to develop the most effective and customer-focused opt-out recruitment process. The opt-out phase is important as it will provide results that are more representative of the customer population in general and will be more useful in informing future default rate designs.

As the pilots and their costs are further developed, Orange and Rockland may decide to limit the Rockland County SC-1 pilot to opt-in enrollment given the limited population in Rockland County and

[41] The California Statewide Pricing Pilot, Commonwealth Edison Company, Green Mountain Power, FirstEnergy, DTE, and Nevada Energy used RED.
[42] Adapted from Quantifying the Impacts of Consumer Behavioral Study Experiments and Pilots: Protocols and Guidelines. LBNL, Berkeley, CA and EPRI, Palo Alto, CA: 2013. LBNL-6301E, Pg. 16.

cost constraints. If a complimentary opt-out pilot is not feasible in Rockland County, the Companies will work together to use observations about differences between opt-in and opt-out customers in Westchester or Staten Island to infer the difference between similar customers for Rockland County.

SC-2 customers (those with small commercial with loads under 10kW[43]) will be included in the pilots for Con Edison based on stakeholder feedback during the collaboration process. These customers make up smaller portions of the mass market than SC-1 in most areas. As such, there is not sufficient population to support both opt-in and opt-out pilots for SC-2 customers. Indeed, to recruit and enroll a sufficient number of customers for statistically significant sample sizes and pilot results, opt-out will be necessary for this population. Moreover, SC-2 non-demand billed metered customers make up such a small portion of the mass market in Rockland County that the population is not sufficient to support even an opt-out pilot. For that reason, SC-2 customers will not be included for Rockland County.

5.3.8 Establishment of a Baseline for the Samples

Another aspect of the recruitment process that requires attention is the importance of selecting a control group that can be used with confidence in portraying the role of the "other" customers' behavior if they had not been put on another rate structure. This is difficult to achieve and, if the control group has subtle differences from the treatment groups, then the results can be biased without some baseline data.[44]

In addition, this pilot will be testing demand-based rates. Where previous pilots tested the way volume (kWh) was being priced (changing the per kWh charge by time), the Companies' pilot is changing the fundamental way customer use of the system is measured and priced. It is testing a transition from a per kWh charge to a per kW charge.

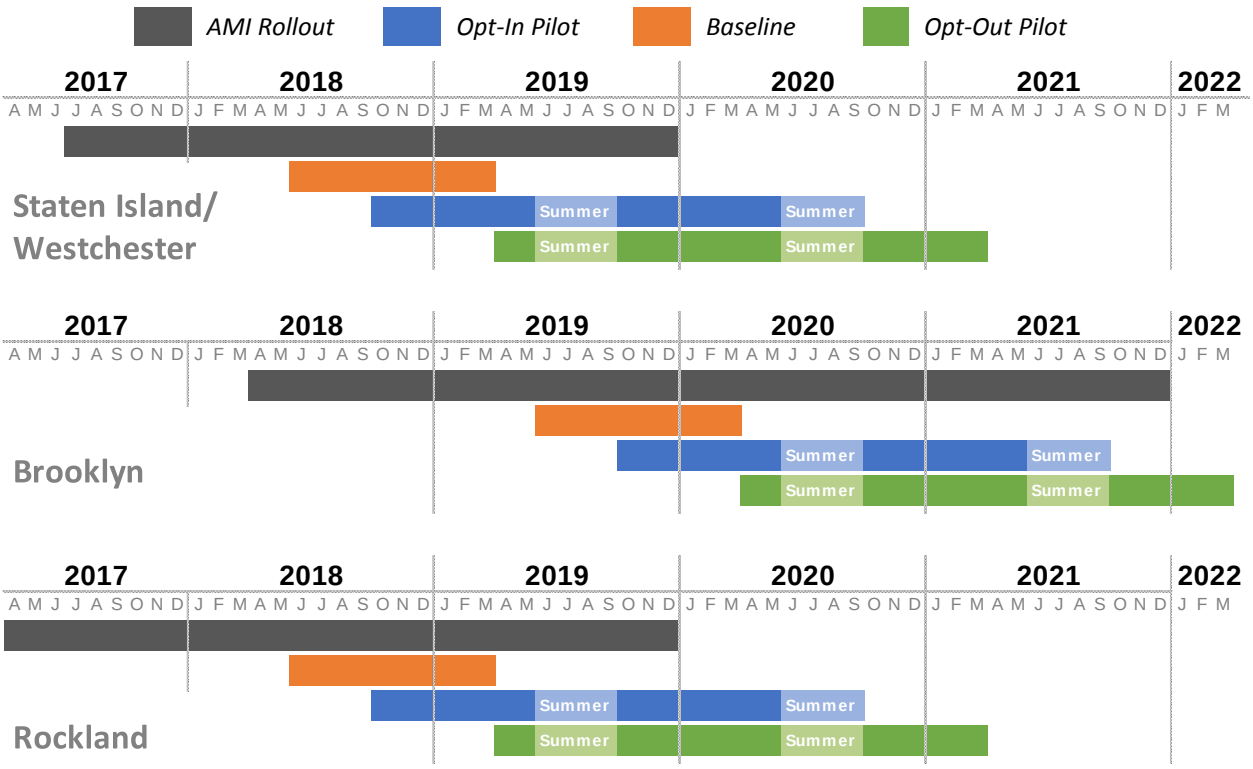
For these reasons, the Companies will include a baseline of data from customers in all of the sample groups in order to duplicate, as best as possible, the pre-rate behavior of the identical customers in the pilot. The establishment of this baseline will require collecting interval data for at least a summer period in advance of the beginning of the pilot, and thus a sufficient number of customers will need to have an AMI meter for a number of months before the pilot commences (with some customers having a longer baseline collection period depending on how early they receive their AMI meter).

5.4 Proposed Pilots and Timeline

The timing and location of the rate pilots is primarily contingent on the AMI rollout schedule. In order to start the pilots as soon as possible, the first pilots will take place in Staten Island and Westchester (for Con Edison) and Rockland County (for Orange and Rockland). The initial Con Edison pilot will be followed by a pilot in Brooklyn the next year (see Figure 5-4) to study the effects of the alternative rate structures in an urban environment.

[43] See Schedule for Electricity Service, P.S.C. No. 10 at http://www.coned.com/documents/elecPSC10/SCs.pdf.
[44] See Quantifying the Impacts of Time-Based Rates, Enabling Technology, and Other Treatments in Consumer Behavior Studies - Protocols and Guidelines, EPRI: Palo Alto, CA: July 2013. 3002000282, pp. 2-27 – 2-28. "This bias can be at least partially addressed through the inclusion of pretreatment load in the analysis and/or through the use of control variables, such as the presence of AC."

Figure 5-4 Preliminary Pilot Timelines for the Companies[45]



The pilot in Staten Island and Westchester will run concurrently to maximize the number of potential participants. Based on similarities in housing stock and populations in the two areas, Con Edison hypothesizes that it will be possible to segment participants and establish treatment groups across them.

Given that these two areas are not necessarily representative of the other highly dense urban areas in Con Edison's territory (as noted by stakeholders during collaboration meetings), Con Edison will conduct a separate pilot in Brooklyn starting one year later (see Figure 5-4) to assess the responses of such a population.

For SC-1, there will be a lag of at least six months between the beginning of opt-in and opt-out pilots in all locations (for Rockland County, this assumes the inclusion of an opt-out pilot). This will allow lessons learned from the voluntary group of opt-in participants to better inform rate and pilot design before opt-out pilots are implemented.

The pilots will run for a time period sufficient to capture load impacts over two summer peak periods.

[45] Note that this timeline includes an opt-out pilot for Rockland County, which may be implemented if feasible. This timeline also assumes a lag of at least six-months between opt-in and opt-out pilots.

5.5 Sampling Design

The rate pilots for Con Edison and Orange and Rockland will include control groups with which changes in treatment groups can be compared. These will be further supported through the collection of baseline usage information with interval meters to better compare how customers react to the introduction of demand-based delivery rates (as described in Section 5.5.3).

5.5.1 Control and Treatment Groups

Each of the pilots will include the following participant groups (see Figure 5-4 for the corresponding timelines):

1. SC-1 opt-in participants:

   Staten Island and Westchester: The SC-1 opt-in will begin collecting baseline data no later than June 2018 (the beginning of the predefined summer season).[46] The new rates will be introduced in October 2018 and the pilot will continue through September 2020.

   Brooklyn: The SC-1 opt-in will begin collecting baseline data no later than June 2019 (the beginning of the predefined summer season). The new rates will be introduced in October 2019 and the pilot will continue through September 2021.

   Rockland: The SC-1 opt-in will begin collecting baseline data no later than June 2018 (the beginning of the predefined summer season). The new rates will be introduced in October 2018 and the pilot will continue through September 2020.

2. SC-1 opt-out participants:

   Staten Island and Westchester: The SC-1 opt-out will begin collecting baseline data no later than June 2018, but will continue to do so until their pilot rates are introduced. Assuming opt-out pilots start six months later, this pilot would run from April 2019 through March 2021.

   Brooklyn: The SC-1 opt-out will begin collecting baseline data no later than June 2019, but will continue to do so until their pilot rates are introduced. Assuming opt-out pilots start six months later, this pilot would run from April 2020 through March 2022.

   Rockland: Assuming that Rockland includes an opt-out pilot for SC-1, it will begin collecting baseline data no later than June 2018 as well, but will continue to do so until their pilot rates are introduced. Assuming opt-out pilots start six months later, this pilot would run from April 2019 through March 2021.

3. SC-2 opt-out participants:

   Staten Island and Westchester: The SC-2 opt-out will also begin collecting baseline data no later than June 2018, but will continue to do so until their pilot rates are introduced. Assuming opt-out pilots start six months later, this pilot would run from April 2019 through March 2021.

[46] As described in Section 5.3.8, a minimum of one summer of baseline data will be collected for all participants, but more will be available for some customers depending on their AMI meter installation date.

Brooklyn: The SC-2 opt-out will begin collecting baseline data no later than June 2019 as well, but will continue to do so until their pilot rates are introduced. Assuming opt-out pilots start six months later, this pilot would run from April 2020 through March 2022.

These participants will be organized into the following control and treatment groups, subject to availability of participants.

Table 5-2 Treatment Cells[47]

SC-1 Pilots	Recruitment Approach	
	Opt-In	**Opt-Out**
Existing Delivery Rates with Existing Supply and Surcharge Rates	*Control 1*	*Control 2*
Demand-Based Delivery Rate 1 with Existing Supply and Surcharge Rates	Treatment 1-1	Treatment 2-1
Demand-Based Delivery Rate 2 with Existing Supply and Surcharge Rates	Treatment 1-2	Treatment 2-2

SC-2 Pilots	Recruitment Approach
	Opt-Out
Existing Delivery Rates with Existing Supply and Surcharge Rates	Control 1
Demand-Based Delivery Rate with Existing Supply and Surcharge Rates	Treatment 1-1

In Both Companies' Pilots *Just In Con Edison Pilots* *In Con Edison, Possible for O&R Pilots*

5.5.2 Sample Size Benchmarking and Estimates

The details about sample size requirements and treatment group composition for the Con Edison and Orange and Rockland pilots will require significant market research and statistical analysis to finalize (described further in the pre-pilot section of 5.6 Customer Education and Information Program). Reviewing the sample sizes and statistical power of previous pilots (including those conducted under ARRA; see Table 5-3) allows for an estimate of the number of participants that might be required for each pilot cell.

[47] Each of the control and treatment groups (up to eight total for each pilot) listed in Table 5-2 constitutes a "cell".

Table 5-3 Survey of Participants and Treatment Groups in Selected Rate Pilots[48]

	CA SPP	ComEd	First Energy	Green Mountain	Marblehead	OK G&E	SMUD	DTE	NV Energy	VT Elec. Coop
Participants	2,500	8,000	976	3,735	532	2,516	9,926	3,251	7,440	1,689
Control(s)	3	1	1	2	1	1	1	3	2	1
Treatments	17	24	6	7	1	8	7	4	12	1
Group Range	-	200, 400	91-250	195,390,1,200	263,269	213-549	93-2,018	249-1,212	150-914	841,848
Group Avg.	125	320	139	415	266	280	1,241	464	531	845

On average, each of the control and treatment groups in these pilots had 463 participants (with a wide variation both within and between pilots). In order that this number of participants can be retained until the end of a pilot, however, extra participants must be enrolled at the beginning to allow for losses from moving and participants dropping out. For example, SMUD included an allowance for 20% participant losses in their pilot, but actually experienced total losses closer to 25%.[49]

Table 5-4 Assumptions for Participant Losses in Each Area[50]

Area	A 2yr SC-1 Move %	B 2yr SC-2 Move %	C Est. Opt-in Drop Rate	D Est. Opt-out Drop Rate
Staten Island & Westchester	17.44%	31.04%	1.25%	2.73%
Brooklyn	22.71%	27.80%	1.25%	2.73%
Rockland	13.10%	N/A	1.25%	2.73%

To allow for the losses that are estimated for the pilot areas over a two-year pilot period (in Table 5-4), the groups in each area would need to include the numbers of participants listed in Table 5-5.

[48] CA SPP, Com Ed, and ARRA Studies.
[49] SmartPricing Options Final Evaluation: The final report on pilot design, implementation, and evaluation of the Sacramento Municipal Utility District's Consumer Behavior Study (Sept. 2014). (SMUD).
[50] The estimated percentage of customers expected to move over a two-year pilot was calculated using the annual average proportion of new accounts turned on relative to total accounts for the five years between 2011 and 2015 for each of the pilot areas. Estimated drop-out rates for opt-in and opt-out are based on averages for those groups in SMUD's pilot.

Table 5-5 Preliminary Estimates of Required Sample and Pilot Sizes[51]

	Group	A Group Size	B Total	C Tot. Inc. Contingency
Staten Island & Westchester	SC-1 Opt-in	549	1,647	1,809
	SC-1 Opt-out	556	1,668	1,832
	SC-2 Opt-out	619	1,238	1,359
	Total Participants	**---**	**4,553**	**5,000**
Brooklyn	SC-1 Opt-in	573	1,720	1,842
	SC-1 Opt-out	580	1,741	1,864
	SC-2 Opt-out	604	1,208	1,294
	Total Participants	**---**	**4,669**	**5,000**
Rockland	SC-1 Opt-in	529	1,587	1,863
	SC-1 Opt-out	536	1,608	1,887
	Total Participants	**---**	**3,195**	**3,750**

5.5.3 Available Pilot Populations

The number of possible treatment groups and variables tested in each of the pilots will ultimately depend on the number of participants for each category and the resulting sample sizes that can be achieved. The control and treatment cells outlined above should be achievable for most of the pilot groups. Note that SC-2 will not be included for Rockland County because the number of available customers (only 476, as explained in Section 5.5.3.3) will not be sufficient to draw statistically valid inferences, so the added cost is not justified. The estimates included in this section are preliminary, and they will be refined during pilot design and recruitment.

The timing of the pilots is dependent on the AMI rollout schedule (see Figure 5-4) for each territory, which in turn will determine the available populations of customers with AMI meters. In order for each pilot to be successful, it must have a large enough population to achieve the required sample sizes by the time the baseline data collection is scheduled to start. Based on benchmarking research and details about the populations of customers in each pilot area, the following estimates were developed for the pilot populations for each of the cells described in Table 5-2.

[51] Note that this table assumes that two demand rates will be tested, and opt-out will be included for SC-1 customers in Rockland County. Column A is the estimated group size for each customer and enrollment type based on the adjustments detailed in Table 5-5. Column B shows the total number of participants of each type for the different pilots based on the number of control and treatment groups detailed in Table 5-2. Column C includes additional contingency for each category given the finding in previous pilots that these estimates are frequently understated (see SMUD for example).

5.5.3.1 SC-1 Opt-In Participants

The AMI meter rollout schedule is not specified by customer classes. To approximate the number of SC-1 customers with AMI meters at any given time, one can assume that the proportion of SC-1 customers with AMI meters will be the same as that for the general customer population in each of the pilot areas (as calculated in Table 5-6).

Table 5-6 Approximate SC-1 Customers in Each Pilot Area

	Total Cust. (Meters)	# SC-1	% SC-1
Staten Island (SI)	182,000	146,260	80.36%
Westchester (W)	361,790	208,638	57.67%
SI & W	543,790	354,898	65.26%

	Total Cust. (Meters)	# SC-1	% SC-1
Brooklyn	988,000	404,822	40.97%

	Total Cust. (Meters)	# SC-1	% SC-1
Rockland	115,501	98,690	85.45%

Based on these proportions, at the time that the baseline data collection is anticipated to begin for each of the pilots, the number of SC-1 customers that will have their new AMI meters in each territory will be approximately 190,000 in Staten Island and Westchester, 135,000 in Brooklyn, and 49,000 in Rockland County. Not all of these customers will be eligible to participate in the pilot, however. Customers that are already enrolled in voluntary TOU rates, net metering rates, and energy efficiency programming will likely need to be excluded from the pilot population, since their participation (and relatively low base usage) could skew the applicability of pilot results and findings for a more general population.

Eliminating these customers reduces the populations as follows:

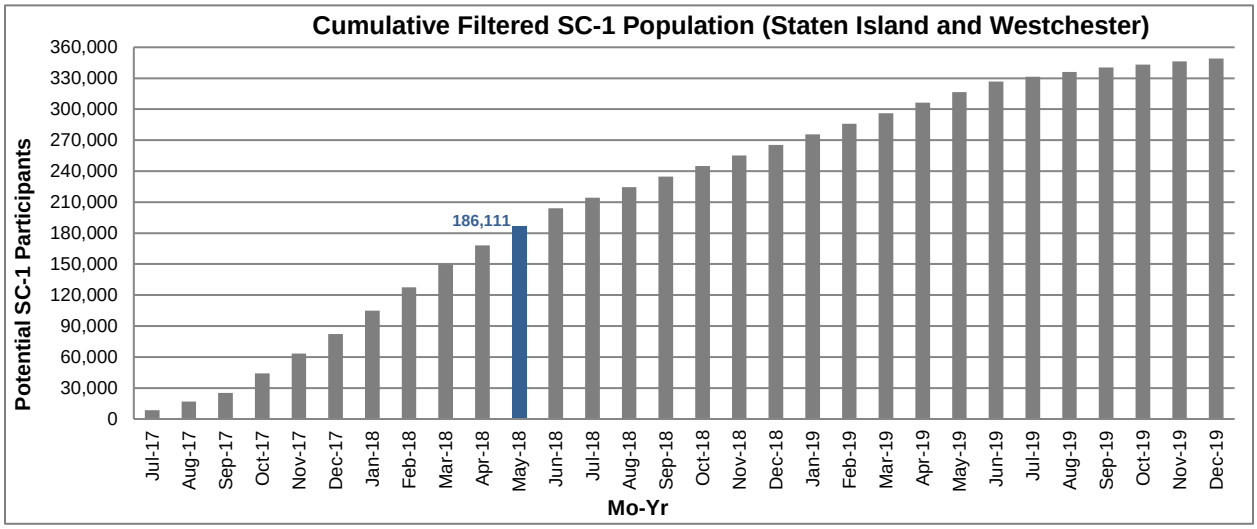
Staten Island and Westchester: Approximately 2.3% of the population in Staten Island and 1.2% of the population in Westchester would be excluded (based on the current proportion of customers enrolled in those programs in those two areas). The estimated population of SC-1 customers available for the both the opt-in and opt-out portions of the pilot is therefore approximately 186,000.

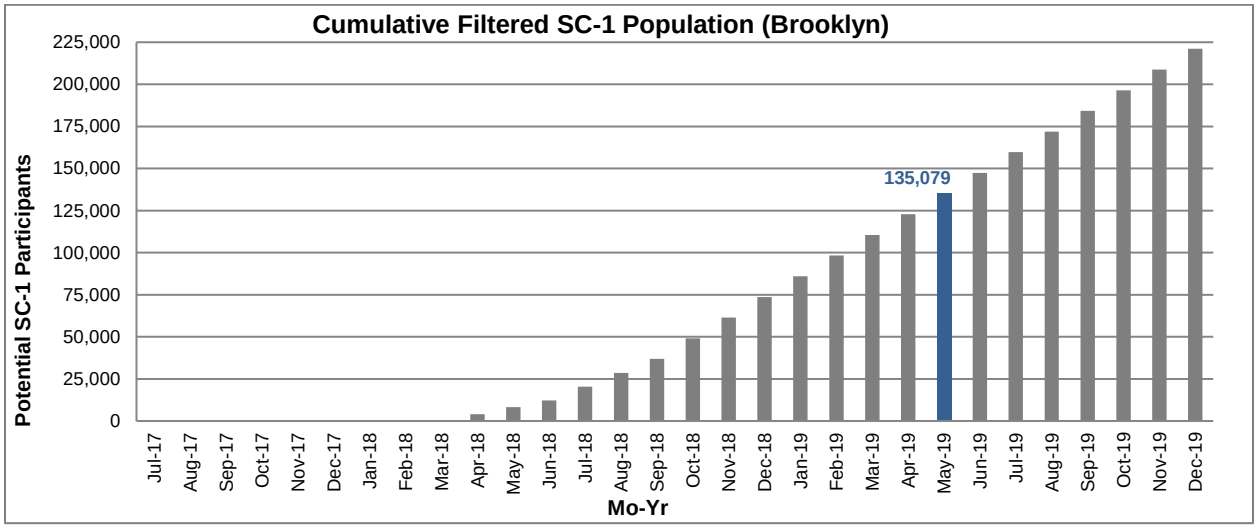
Brooklyn: Eliminating these customers reduces the populations very little (by approximately 0.1%) for Brooklyn. The estimated population of SC-1 customers available for both the opt-in and opt-out portions of the pilot is therefore still approximately 135,000.

Rockland: Eliminating these customers reduces the population by approximately 1.9% for Rockland County (based on the current proportion of customers enrolled in those programs in

those two areas).[52] The estimated population of SC-1 customers available for both the opt-in and opt-out portions of the pilot is therefore slightly more than 48,000.

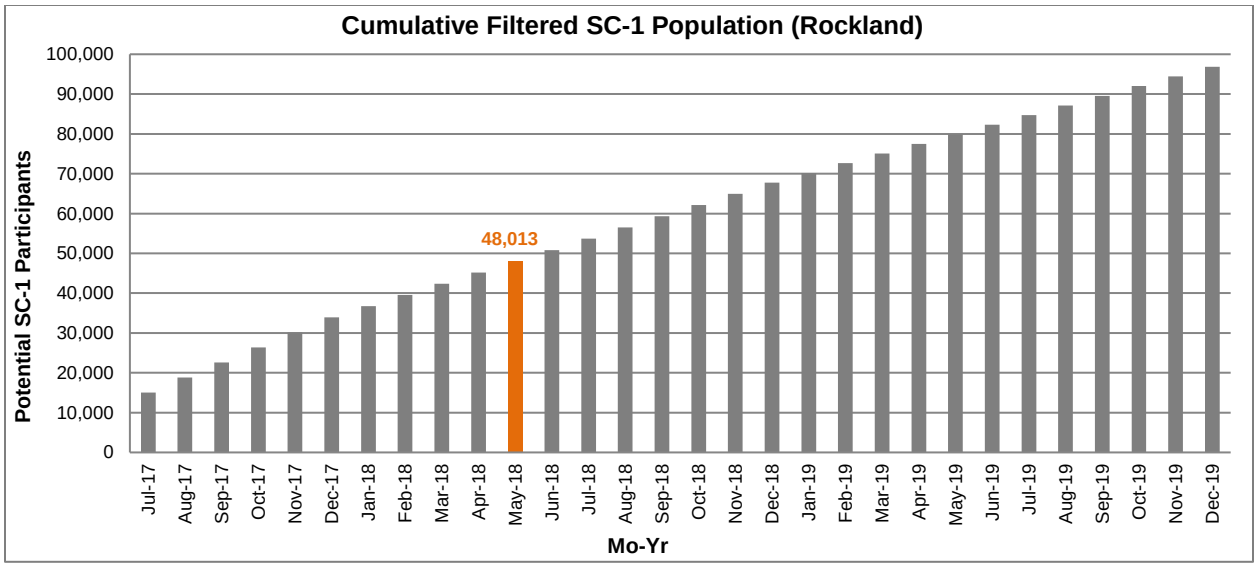
Figure 5-5 Cumulative Filtered SC-1 Populations for All Pilots (Based on Meter Penetration)





[52] TOU is a separate rate class for residential (SC-19) in Orange and Rockland, so it is not included in SC-1, and does not need to be subtracted.

Figure 5-5 continued (Cumulative Filtered SC-1 Populations for All Pilots (Based on Meter Penetration))



While there have been few mass market rate pilots including demand charges, the estimated opt-in rate for those with demand rates is generally considered to be slightly less than 1%[53] (based on limited examples in Norway, North Carolina, and Wisconsin).[54] Both Con Edison and Orange and Rockland plan to pre-select SC-1 customers with AMI meters who also display characteristics of consumers most likely to opt-in to the rate pilot based on market research and surveys before the pilot begins. This pre-filtered portion of the SC-1 population will then receive detailed outreach and education about the new rates and opportunities to save (see preliminary details in Section 5.6) in order to encourage the required number of customers to participate in the opt-in portion of the rate pilot. This strategy should help Con Edison and Orange and Rockland achieve higher opt-in rates in a relatively cost-effective manner.

Using this strategy, Con Edison and Orange and Rockland may be able to surpass the 1% opt-in rate estimated by RMI.[55] For each pilot, the following assumptions are made, though the exact proportions will vary based on the final eligible population, the opt-in rates achieved, and the remaining population once the opt-in threshold has been met:

[53] James Sherwood et al., A Review of Alternative Rate Designs: Industry experience with time-based and demand charge rates for mass-market customers (Rocky Mountain Institute, May 2016), http://www.rmi.org/alternative_rate_designs, Pg. 72. (RMI)

[54] Hledik, Ryan, *Rolling Out Residential Demand Charges*, presented to EUCI Residential Demand Charges Summit, May 2015.

[55] As described in Section 3.1, Con Edison conducted telephone and web surveys to assess the level of interest in rate pilots and other AMI related topics. Online respondents were more likely than telephone respondents to report interest in learning about pricing plans and energy conservation programs. However, levels of interest for both groups are robust, with approximately 70 percent of telephone respondents reporting interest in these topics and more than 85 percent of online respondents reporting interest. This indicates that there may be a higher-than-average opt-in rate in some areas.

Staten Island and Westchester: To be conservative, assume that the opt-in rate will be 2%. In order to realize a population of participants of approximately 1,809 (enough to fill the two treatment cells and one control group with allowances for early drop outs and moves as described in Section 5.5.2), Con Edison would need to set aside approximately 90,000 customers (48%) in the SC-1 population to target for the opt-in portion. These customers will be excluded from the opt-out pilot, which means that approximately 96,000 (52%) will remain for opt-out.

Brooklyn: The same assumptions about opt-in rates and required participants hold for the Brooklyn pilot, except that approximately 1,842 participants will be required to meet the estimated sampling requirements. This means that Con Edison will need to set aside approximately 95,000 customers (70%) in the SC-1 population to target for the opt-in portion. These customers will be excluded from the opt-out pilot, which means that approximately 40,000 (30%) will remain for opt-out.

Rockland: In order to attain the estimated 1,863 opt-in participants required to fill two treatment cells and one control with allowances for early drop outs and still have enough customers to achieve 1,887 participants in the opt-out pilot, Orange and Rockland will need to achieve an opt-in rate of more than 4% so that a maximum of 45,800 SC-1 customers (95%) in this population would need to be targeted for the opt-in portion. These customers will be excluded from the opt-out pilot, which means that in this case the minimum 2,200 (5%) will remain for the opt-out pilot.

5.5.3.2 SC-1 Opt-Out Participants

The proportion of participants that remain in an opt-out rate pilot varies. Again, there is little data for these rates for pilots including demand charges for mass market customers. If one assumes that the opt-out rates will be similar to those for previous TOU rate pilots,[56] then the enrollment rate will likely fall between 87% and 98% as found by the DOE in their assessment of Consumer Behavior Studies conducted under ARRA.[57]

Staten Island and Westchester: Assuming that 96,000 customers would remain to be part of the SC-1 opt-out portion, this could yield enrollment of between 83,000 and 94,000 customers. This is far more than the necessary 1,832 for the pilot (based on populations and sample sizes for other pilots as described in Section 5.5.2), and so only a subset of the eligible population (approximately 2,200) would need to be part of the opt-out portion. Any SC-1 customers that are not selected for the opt-in or opt-out portions of the rate pilot in Staten Island and Westchester will be considered for future pilots such as the Smart Home pilot outlined in the REV Track 2 Order.[58]

[56] An assumption made by RMI in *A Review of Alternative Rate Designs*, pg. 72.

[57] "Interim Report on Customer Acceptance, Retention, and Response to Time-Based Rates from the Consumer Behavior Studies (CBS)," U.S. Department of Energy EE&RE, Jun. 2015. Available at https://www.smartgrid.gov/files/CBS_interim_program_impact_report_FINAL.pdf .

[58] Details about that pilot will be included in the February 2017 filing requested in the REV Track 2 Order, and results from that pilot will be compared with those from this pilot in as much as that is feasible or statistically valid.

Brooklyn: Assuming that 40,000 customers would remain as part of the opt-out portion, this would result in enrollment of between 34,000 and 39,000 customers. This is far more than the necessary 1,864 for the pilot (based on populations and sample sizes for other pilots as described in Section 5.5.2), and so only a subset of the eligible population (approximately 2,200) would need to be part of the opt-out portion.

Rockland: 2,200 customers would remain to be part of the opt-out portion, this would result in enrollment of approximately 1,900 customers. This would be just enough given that 1,887 will be required to fill two treatments and one control for the pilot (based on populations and sample sizes for other pilots as described in Section 5.5.2 and the assumption that retention is at the low end of 87% observed in the DOE studies). Since nearly all of the available SC-1 population will be required to fill the opt-in and opt-out portions of the rate pilot in Rockland, future pilots such as the Smart Home pilot outlined in the Track 2 Order will draw from the 48,000 customers that receive their AMI meter after the cut off for this pilot. Details about that pilot will be included in the February 2017 filing requested in the Track 2 Order, and results from that pilot will be compared with those from this pilot in as much as that is feasible or statistically valid.

5.5.3.3 SC-2 Opt-Out Participants

As explained in Section 5.3.7, the smaller number of SC-2 customers means that an opt-out enrollment strategy will be necessary for SC-2 pilots, and an SC-2 pilot will not be feasible for Rockland County.

Table 5-7 Approximate SC-2 Customers in Each Area

	Total Cust. (Meters)	# SC-2	% SC-2
Staten Island (SI)	182,000	12,067	6.63%
Westchester (W)	361,790	34,064	9.42%
SI & W	543,790	46,131	8.48%

	Total Cust. (Meters)	# SC-2	% SC-2
Brooklyn	988,000	126,274	12.78%

	Total Cust. (Meters)	# SC-2	% SC-2
Rockland	115,501	960	0.83%

Using these proportions, it is possible to estimate the approximate number of SC-2 customers with meters at different points in the AMI rollout. At the time that the baseline data collection is anticipated to begin for each of the pilots, a limited number of SC-2 customers will have their new AMI meters in each territory (approximately 20,000 in Staten Island and Westchester, 42,000 in Brooklyn, and 476 in Rockland). Not all of these customers will be eligible to participate in the pilot however. Customers that are already enrolled in voluntary TOU rates, net metering rates, and energy efficiency programming will

likely need to be excluded from the pilot population, since their participation (and relatively low base usage) could skew the applicability of pilot results and findings for a more general population.

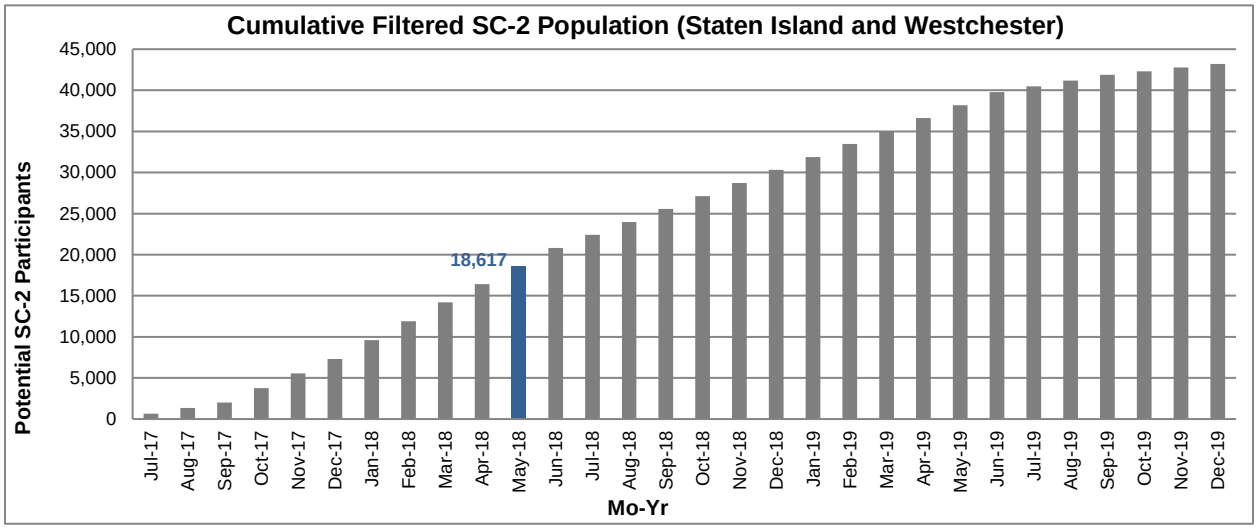
Eliminating these customers reduces the populations as follows:

Staten Island and Westchester: Eliminating these customers reduces the populations by approximately 6.0% for Staten Island and 6.5% for Westchester (based on the current proportion of customers enrolled in those programs in those two areas). The estimated population of SC-2 customers available for the pilot is between 18,000 and 19,000.

Brooklyn: Eliminating these customers reduces the populations by approximately 2.5% for Brooklyn (based on the current proportion of customers enrolled in those programs). The estimated population of SC-2 customers available for the pilot is therefore around 41,000.

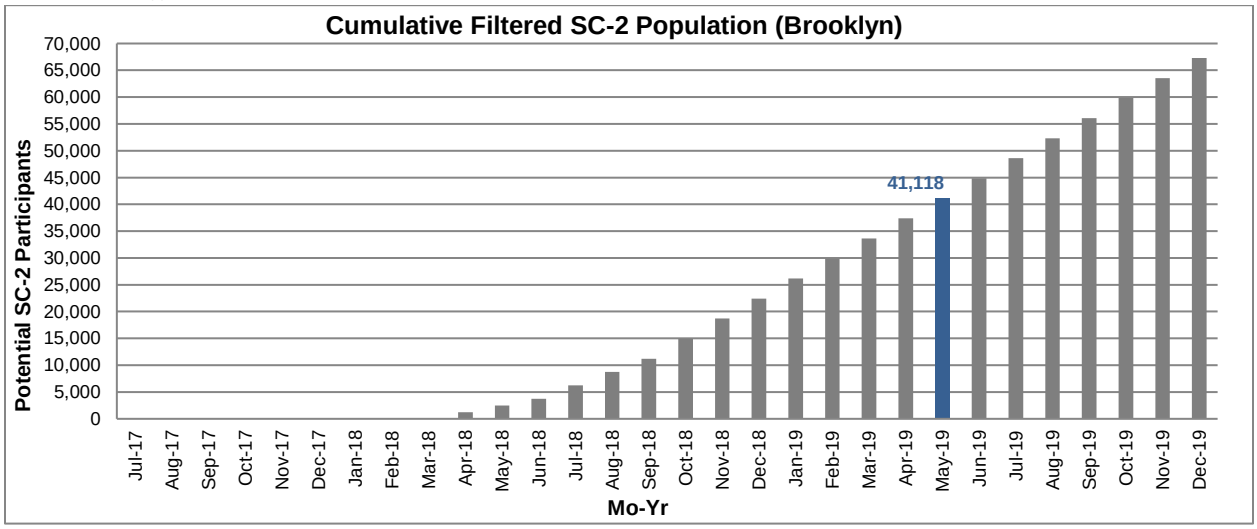
Rockland: None of these apply to the SC-2 non-demand billed metered customers in Rockland at this time[59], however, so the eligible population will be approximately 476.

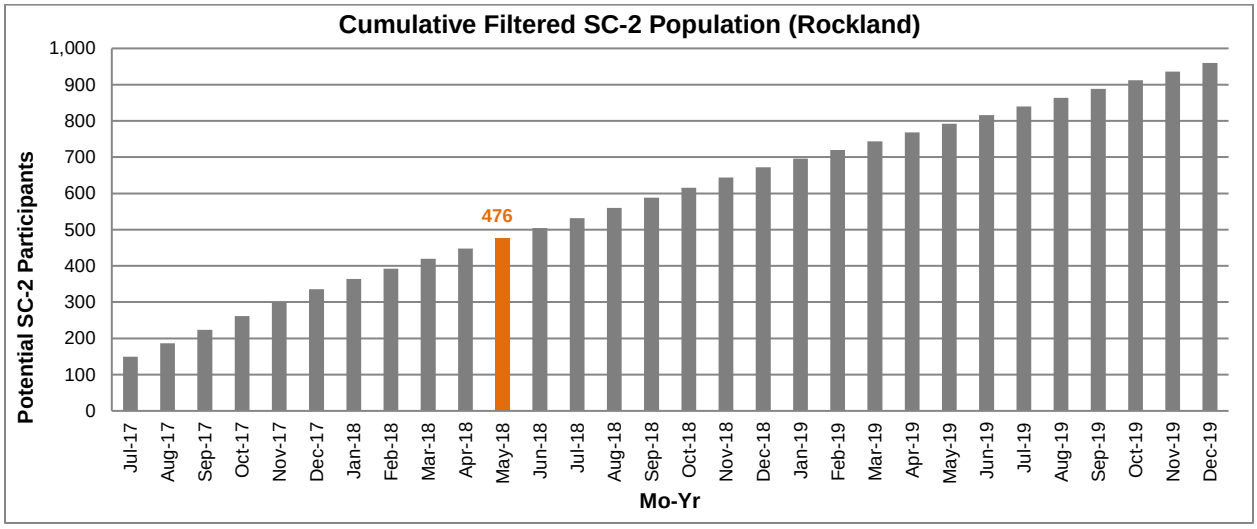
Figure 5-6 Cumulative Filtered SC-2 Population for Each Pilot Area (Based on Meter Penetration)



[59] TOU is a separate rate class for non-residential customers in Orange and Rockland, so it is not included in SC-2, and does not need to be subtracted.

Figure 5-6 continued (Cumulative Filtered SC-2 Population for Each Pilot Area (Based on Meter Penetration))





Again, there is little data for opt-out enrollment rates for pilots including demand charges for mass market customers. If one makes the same assumptions for opt-out rates among SC-2 customers as were made for SC-1,[60] then the enrollment rate will still fall between 87% and 98% as found by the DOE.[61]

> Staten Island and Westchester: Assuming that 18,500 SC-2 customers would be eligible for the pilot, this could result in enrollment of between 16,000 and 18,000 customers. This is more than the estimated 1,359 necessary for the pilot (based on populations and sample

[60] RMI, Pg. 72.

[61] "Interim Report on Customer Acceptance, Retention, and Response to Time-Based Rates from the Consumer Behavior Studies (CBS)," U.S. Department of Energy EE&RE, Jun. 2015. Available at https://www.smartgrid.gov/files/CBS_interim_program_impact_report_FINAL.pdf.

sizes for other pilots as described in Section 5.5.2), and so only a subset of the eligible population (approximately 1,700) would need to be targeted.

Brooklyn: Assuming that 41,000 SC-2 customers would be eligible for the pilot, this would result in enrollment of between 35,000 and 40,000 customers. This is more than the estimated 1,294 necessary for the pilot (based on populations and sample sizes for other pilots as described in Section 5.5.2), and so only a subset of the eligible population (approximately 1,700) would need to be targeted.

Rockland: Assuming that 476 customers would be eligible for the opt-out portion, this would result in enrollment of between 414 and 466 customers. This will not be sufficient to test even one treatment, which will require an estimated 1,268 participants. For this reason, the pilot in Rockland County will not include SC-2 customers.

5.6 Pilot Program Customer Education and Outreach Program

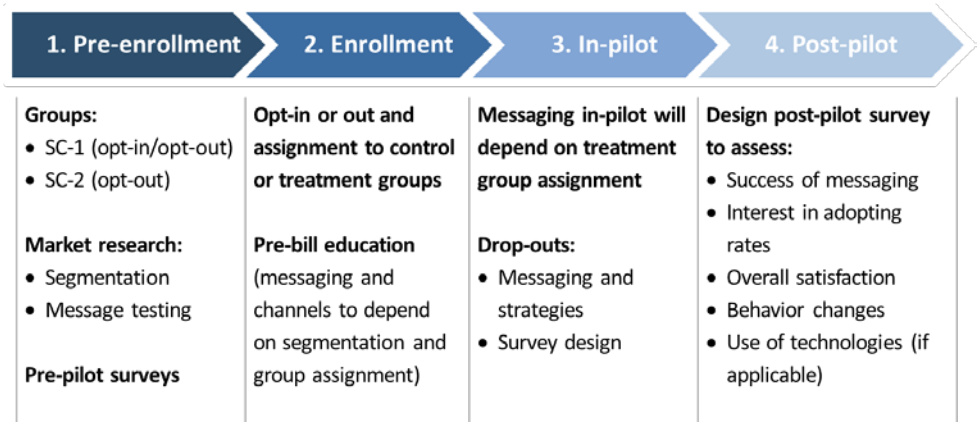
Customer education and outreach is critical to the success of any rate pilot. This has been shown repeatedly across rate pilots. It will be even more critical for those customers encountering demand-based rates for the first time.

Rather than testing education and outreach quantitatively by creating different treatment groups and assessing differences in peak usage or overall energy consumption across different messaging treatments, the Companies propose to provide uniform messaging within each treatment, tailored to their enrollment type, customer class, segmentation (i.e., low income), rate, and any enabling technology they may have available (as elaborated in Section 5.3.5). This messaging will be developed through testing and focus groups prior to customer enrollment in pilots to make it as clear and convenient as possible. The success of the messaging will be assessed qualitatively via surveys to inform education and outreach in future pilots or the introduction of new rates as a default.

The specific messaging, channels, and details of any messaging will be developed as the design and implementation of the pilots move forward. The following is a framework that will be adapted and completed for each.

The education and outreach for each pilot will be organized in four stages, shown in Figure 5-7.

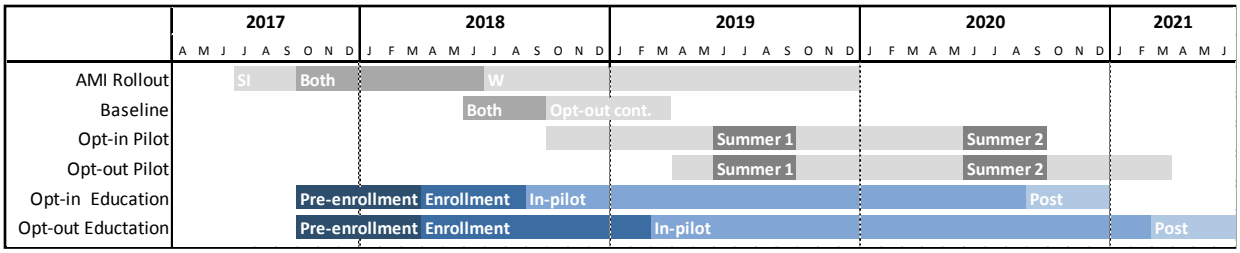
Figure 5-7 Overview of Education and Information Framework



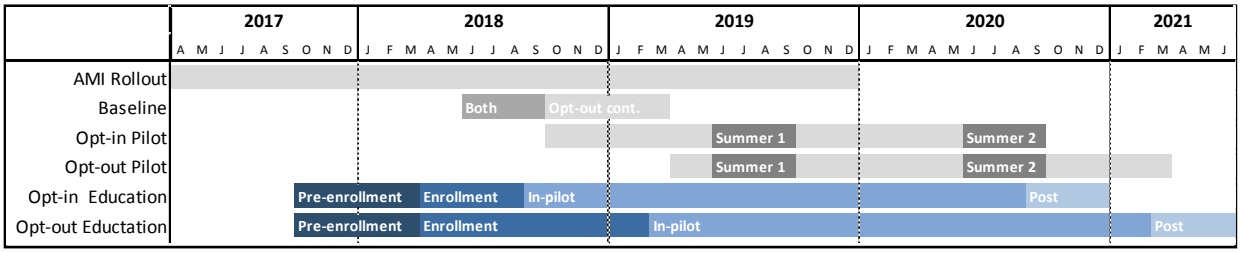
The timing of the education and outreach stages included in the pilots will be further developed in the next stages of the pilot design. As an example of what the timeline might look like for each of the pilots, please see Figure 5-8.

Figure 5-8 Sample Education Timelines for Pilot Areas

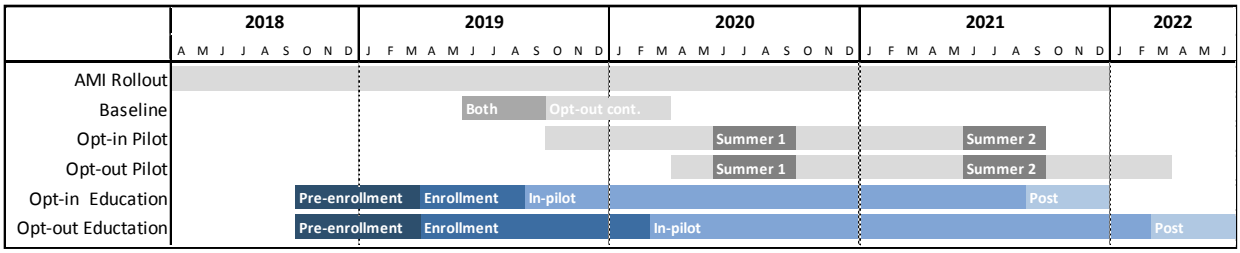
Staten Island (SI) and Westchester (W)



Brooklyn



Rockland



5.6.1 Pre-Enrollment

The customer education and outreach program in the pre-enrollment stage will have two main goals: to gather customer information via market research and surveys, and then to test messaging types for different customer segments to inform the design of messaging in later pilot stages. This stage will also include general messaging to targeted customers about the opportunity to participate in a rate pilot.

5.6.1.1 Gather Customer Characteristics and Segmentation Information

This portion of the process will be closely linked with the market research to segment customers and assign them to treatment groups. Information about the customer segments will be collected via two methods: market research and pre-pilot surveys.

The Companies will conduct market research based on demographics, energy usage and other customer information. This information may be collected and analyzed via existing vendor-enabled Con Edison customer engagement and segmentation tools. Additional details about customers in the pilot areas can also be collected through pre-pilot surveys, which are frequently used to acquire more information about customer habits, energy usage, and knowledge while gauging interest in participation.[62] The pre-pilot survey has not yet been designed, but the Companies anticipate developing questions and perhaps even different survey versions in order to gather the required data from different customer classes (SC-1 and SC-2), regions (Staten Island, Westchester, Brooklyn, and Rockland County), enrollment methods (opt-in and opt-out), and anticipated treatment or control group assignments.

Table 5-8 Table Summarizing Pre-pilot Survey Categories

SC-1 (opt-in and opt-out)	SC-2 (opt-out)
Residence Type	Business Type
Household Characteristics	Business Characteristics
Behavior Information	Behavior Information
Energy Usage Characteristics	Energy Usage Characteristics

5.6.1.2 Test Customer Messaging to Prepare for Rate Pilots

Prior to starting the pilot, the Companies will begin developing the messaging for the Enrollment and In-pilot phases of education. To inform this process, they will collect customer insights and preferences via pre-pilot surveys and focus groups.

Information about customers' understanding of rates and enabling technology as well as their preferences for messaging channels can be assessed broadly via the pre-pilot survey. To build on this and test messaging concepts, focus groups will be held for each pilot area. Focus groups will be designed to include a spectrum of different customer classes and the segments within them, such as low to moderate income ("LMI") customers.

5.6.1.3 Early Messaging and Community Awareness

In addition to any preliminary outreach that is conducted as part of market research, surveys, and focus groups, the Companies will also begin sharing general news about the pilot opportunity through selected channels including but not necessarily limited to direct mail and internet (particularly e-mails). Early messaging will be high level, instructing customers in a pilot area that there will be the opportunity to participate in pilots that can save them money on their bill, and they should look for additional information in the near future.[63] The specific content, form, and channels for this messaging will be determined closer to the pre-enrollment phase of each pilot based on findings of market research and focus groups. At the very least, each will require messaging that is directed toward the appropriate

[62] Examples from ARRA pilots that conducted pre-pilot survey: First Energy, Green Mountain Power, Marblehead Municipal Light Department (oral survey), Oklahoma Gas and Electric, DTE, NV Energy, and Vermont Electric Cooperative.

[63] See, for example, solicitation letter from SDGE (for CA SPP) and the MN Power post card (available at https://www.smartgrid.gov/files/MN_Power_CBP_interim_report_FINAL_with_March6_date.pdf).

customer classes and segments within them, and which is tailored to those that would be selected for opt-in or opt-out enrollment strategies as appropriate. For example, customers pre-targeted for an opt-in pilot would receive messaging explaining that any pilot and the opportunity for savings to encourage them to opt-in. Customers targeted for opt-out enrollment on the other hand would receive messaging about the opportunities that come with participation, but with emphasis on the fact that they must take action if they do not wish to be part of the pilot. Opt-out customers would receive frequent messaging in this period as well to ensure they are aware of this aspect of the pilot.

5.6.2 Enrollment

In the enrollment stage, customer education will have two goals. First, to encourage pilot enrollment (whether opt-in or opt-out) so that there will be sufficient participation to make the results and findings from the pilots statistically valid (as described in Section 5.5.2). Second, after using data collected in the pre-enrollment stage to form control and treatment groups, informing participants of assignments (if in treatment groups) with details about associated rates and how they work.

5.6.2.1 Messages

Con Edison and Orange and Rockland will develop messaging for each of the different control and treatment groups to inform them of their assignment, explain their respective rates, and encourage those customers to opt-in as appropriate for an RED-based pilot (described in Section 5.3.6).

5.6.2.1.1 Messaging for Control Group Customers

For both opt-in and opt-out pilots, there will not be any special messaging for participants in the control groups as described for RED in Section 5.3.6.

5.6.2.1.2 Messaging for Treatment Group Customers

All participants in the treatment groups will receive information about their assignment. This communication will also include information about the details of the demand-based rate and how it works. Con Edison and Orange and Rockland are considering materials from utilities that have successfully offered voluntary residential demand charges, such as Salt River Project (SRP)[64] and Arizona Public Service Electric Company (APS).[65] Opt-in rates as high as 8-10% have been reported for long-standing voluntary residential demand charge programs such as those offered by Black Hills Power and APS.[66] While these are not directly applicable to the pilots here, they do provide examples for messaging and education.

For opt-out pilots, this messaging will provide additional detail and reiterate that customers must take action to opt-out of the new rate before the pilot begins.

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[64] For example, see SRP materials at http://www.srpnet.com/prices/home/residentialdemand.aspx.
[65] For example, see APS materials: https://www.aps.com/en/residential/accountservices/serviceplans/Pages/demand-rates.aspx.
[66] James Sherwood et al., A Review of Alternative Rate Designs: Industry experience with time-based and demand charge rates for mass-market customers (Rocky Mountain Institute, May 2016), http://www.rmi.org/alternative_rate_designs, Pg. 72. (RMI)

5.6.2.2 Channels

The channels for educational messaging in the Enrollment Phase will vary based on the service class, customer type, segmentation, and treatment group of the customer and the type of message in question. Selected options for each are detailed in the following table.

Table 5-9 Table Summarizing Enrollment Phase Channels

SC-1 (opt-in and opt-out)	SC-2 (opt-out)
Direct Mail	Direct Mail
Online (web and e-mail)	Online (web and e-mail)
Bill Messages	Bill Messages
Phone (in bound calls)	Phone (in bound calls)

5.6.3 In-Pilot Campaign[67]

Messaging examples in this section are provided for the purpose of illustration. The Companies will develop and refine any messaging through the customer and market research described in Section 5.6.1.

The in-pilot portion of the campaign will begin shortly before the new rates go into effect. First, messaging will serve as a reminder to customers about the pilot. For those that opted in early, they may require a refresher about the rate and the program. For those enrolled via the opt-out method, this reminder will serve as an additional notice before pilot commencement.

Aside from the initial goal of reminding customers about the new rates, education, and outreach messaging during the in-pilot phase will be conducted in order to:

- equip participating customers with the knowledge to effectively engage in pricing pilots,
- maintain a high retention rate, and
- assess reasons for any customer dropouts in order to gain insights on causes.

5.6.3.1 In-Pilot Messaging

The following sections provide a high level framework for the types of messaging for each customer class and treatment group. The messaging can be divided into two categories: education and alerts.

5.6.3.1.1 Educational Messaging

The control groups for all of the pilots will not receive educational messaging. They will have access to the same level of usage information through the web site as any customer that has AMI, but nothing beyond that.

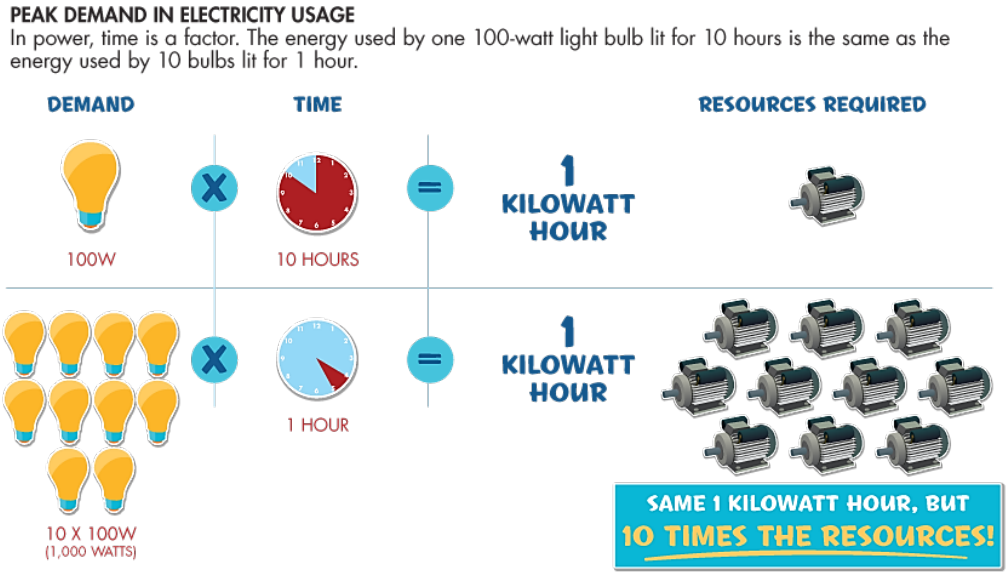
For those customers that are enrolled in demand-based delivery charges (in the pilots' treatment groups), educational materials and alerts will follow the same basic framework, though the specific

[67] Messaging examples in this section are provided for the purpose of illustration. The Companies will develop and refine any messaging will be refined through the customer and market research described in Section 5.8.1.

details may differ by customer type, enrollment method, or customer preferences. Educational details for all groups will answer the following critical questions (with special attention to LMI customers):

- **How do demand charges work?** First and foremost, educational materials in this category will aim to provide users with the specific details about their demand-based delivery charges (such as peak times, the number of peaks, seasonality, and other details). These materials will likely further explain the basic structure and rationale for demand charges, and why they better reflect the costs of transmission and distribution. The material in this section will be the same for SC-1 and SC-2 customers across pilots, with the exception of rate structure details that might differ between the two.

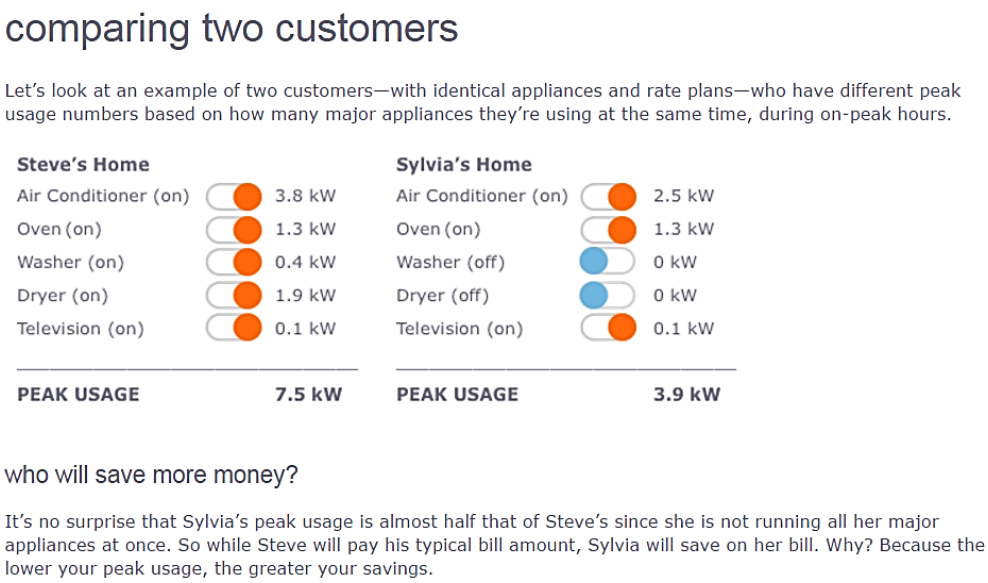
Figure 5-9 SRP Graphic Explaining Demand[68]



- **How will demand rates impact bills?** Educational material for this area will focus on how new rates impact customer bills. This could be accomplished by presenting a hypothetical user and showing how their bill might look under the two different rates, but that is not advisable. This kind of hypothetical shadow billing (or more specific shadow billing for the customers themselves) may prejudice people against the rates depending on their usage and create selection bias in opt-in groups, where only those that would do better on the current rate without behavior changes would opt-in, defeating the purpose of the pilot. Rather, it seems better to approach this portion of education in a manner similar to APS (see Figure 5-10), and focus on how two similar users with different behaviors are billed when they are both on the demand rate. This genre of messaging would need to be developed separately for SC-1 and SC-2 customers given that the two could have slightly different demand rates, and they have very different energy uses and load profiles.

[68] For example, see SRP materials at http://www.srpnet.com/prices/home/custgengraphic.aspx.

Figure 5-10 APS Graphic Explaining Demand Impact on Utility Bills[69]



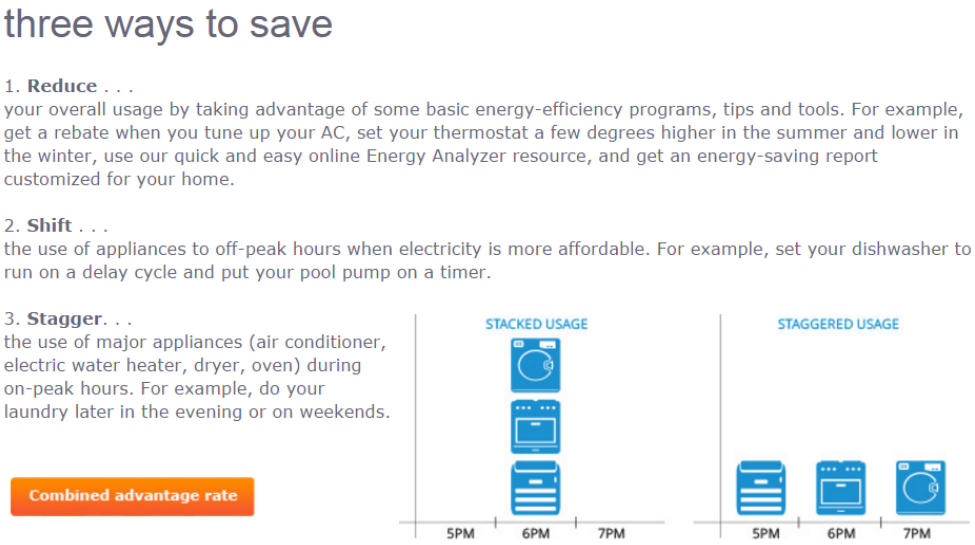
- **How can I save money under new demand rates?** This educational material will focus on strategies that customers can employ to save money under demand rates. While the pilot is not testing enabling technologies as a variable, some recommended strategies may be related to enabling technology such as PCTs that they can choose to implement, or the opportunity to enroll in other Con Edison Energy Efficiency[70] programs (such as Smart ACs[71]), which could help to manage usage at certain peak times. The majority of the educational material, however, will focus on how changes in behavior can help users reduce peak demand and electric bills. For example, APS has developed straightforward and easy-to-follow graphics (see Figure 5-11) to explain how staggering the usage of major appliances (rather than stacking, or using them simultaneously) can help customers avoid high peak demand charges without foregoing necessary household usage. Materials for technology and behavior changes would need to be customized to match the different uses, available technologies, and load profiles of SC-1 and SC-2 customers.

[69] For example, see APS materials at https://www.aps.com/en/residential/accountservices/serviceplans/Pages/demand-rates.aspx.

[70] See Con Edison, "Energy Efficiency" at http://www.coned.com/energyefficiency/default.asp. O&R offers a similar BYOT Program with smart thermostat enabling technology. O&R saturation of Room ACs is much less than Con Ed's, so they are not concentrating on Smart AC but rather central air cycling. O&R is further considering cycling of electric water heater and pool pumps.

[71] See Con Edison, "Control Your Cool with Smart ACs" at http://www.coned.com/energyefficiency/smart-appliance-program.asp?utm_source=Samrt-AC-kit&utm_medium=Slider&utm_campaign=Homepage.

Figure 5-11 APS Graphic Explaining Saving Strategies[72]



5.6.3.1.2 Alerts and Usage Information

In addition to educational information about new rates and strategies to save with them, the Companies will also provide participants data about their usage to help them monitor their performance. Detailed electricity consumption data will be available to participants via the new DCX platform in 15-minute intervals on a day behind basis through 2017, and then on a 30-minute lag thereafter. In addition, pilot participants will have the opportunity to sign up for alerts about high bills via the method of their choice (e.g., phone, e-mail, and text message).[73] For demand billing, this could include alerts when a new peak demand was set the day before to tell customers what their demand is and to advise them about how they can avoid increasing it further before the end of the billing period. Additional information could be made available on a monthly basis in the form of an energy statement and an assessment of how the customer could lower their demand and thus improve their energy bill. The specific format and content of these messages would likely differ between SC-1 and SC-2 customers given their different energy uses and load profiles.

5.6.3.1.3 Dropout Messaging and Surveys

While Con Edison and Orange and Rockland aim to achieve customer adoption of and persistence on the new demand rates as a goal of the pilot, it is clear from previous rate pilots conducted by other utilities that there will be customers that will request to leave the pilot early.[74] For these customers, the

[72] See APS example at https://www.aps.com/en/residential/accountservices/serviceplans/Pages/demand-rates.aspx.

[73] Previous ARRA pilot examples include: First Energy, Marblehead, DTE.

[74] DTE Energy, Smart Currents Dynamic Peak Pricing: Final Evaluation Report (Aug. 2014). Available at https://www.smartgrid.gov/files/DTE-SmartCurrents_FINAL_Report_08152014.pdf . See Pg. 39: "There were only a handful of respondents who saw CPP events as a reason to drop out of the program at the conclusion of the pilot—a few said other family members were unhappy with what they saw as the "unfairness" of paying a higher

Companies will develop messaging (for both SC-1 and SC-2 customers and for both opt-in and opt-out participants) and a strategy to try and convince them to remain. If they still chose to leave, however, they will be free to do so.

The most frequent reason for attrition during rate pilots, however, is that customers move out of the pilot area.[75] In this case, there is nothing that can be done to convince them to remain. These customers and any that choose to leave the pilot will be given a survey to assess the rates, messaging and other details of the pilot. These surveys will be developed with variations for different customer classes, enrollment methods, and reasons for leaving the pilot early in order to ask appropriate questions of each group about what did or did not work. Previous pilots have collected this information as a part of their qualitative analysis.[76]

5.6.3.2 Channels

The channels for educational messaging in the in-pilot phase will vary based on the service class, customer type, segmentation, and treatment group of the customer and the type of message in question. Some of the channels for different messaging and classes have been described in the previous section. Selected options for each are further detailed in Table 5-10.

Table 5-10 Summary of In-pilot Channels

SC-1 (opt-in and opt-out)	SC-2 (opt-out)
Direct Mail (energy statements, surveys)	Direct Mail (energy statements, surveys)
Online (web portal for energy usage, surveys)	Online (web portal for energy usage, surveys)
E-mail	E-mail
Text Messages	Text Message
Bill Messages	Bill Messages
Phone (inbound for pilot questions and outbound to learn about dropout reasons)	Phone (inbound for pilot questions and outbound to learn about dropout reasons)

5.6.4 Post-Pilot

At the end of the pilot, messaging will focus on next steps for participants, including deciding whether or not they wish to return to their old rates or remain on the pilot rate, if it continues to be available. The most important part of the post-pilot messaging will be the survey that participants complete to provide insight on their experience. Similar surveys have been used to learn more about which messages and

rate when flat rate customers were not; the remaining believed that the CPP events had mitigated so much of their savings that their time-shifting efforts were no longer resulting in any overall savings."

[75] SMUD, pg. 9.

[76] Marblehead Municipal Light Department, ENERGYSENSE CPP Pilot Final Evaluation Report (June 2013). Available at https://www.smartgrid.gov/files/Marblehead_Final_Evaluation_Report_with_Appendices_2013-07-01-1_0.pdf. See Pg. 12: "Each customer who did opt out was asked to explain their motivation for leaving the program with 31 not giving a specific reason, 5 because of health reasons, and 9 customers opted out because they moved. No customer specifically cited the structure or management of the pilot for their departure from the program. However, it should be mentioned that the majority of the opt-outs were from the year 1 CPP group as opposed to the control group."

education did and did not work in the course of a pilot, and the Companies will do the same for these pilots.[77] Other areas for assessment include whether or not customers paid attention to rates and changed their behavior, or whether they implemented any technology to help manage demand. It will be critical to have these insights about the positive and negative aspects of the pilot and what drove success and satisfaction if the Companies ever decide to implement similar rates more permanently.

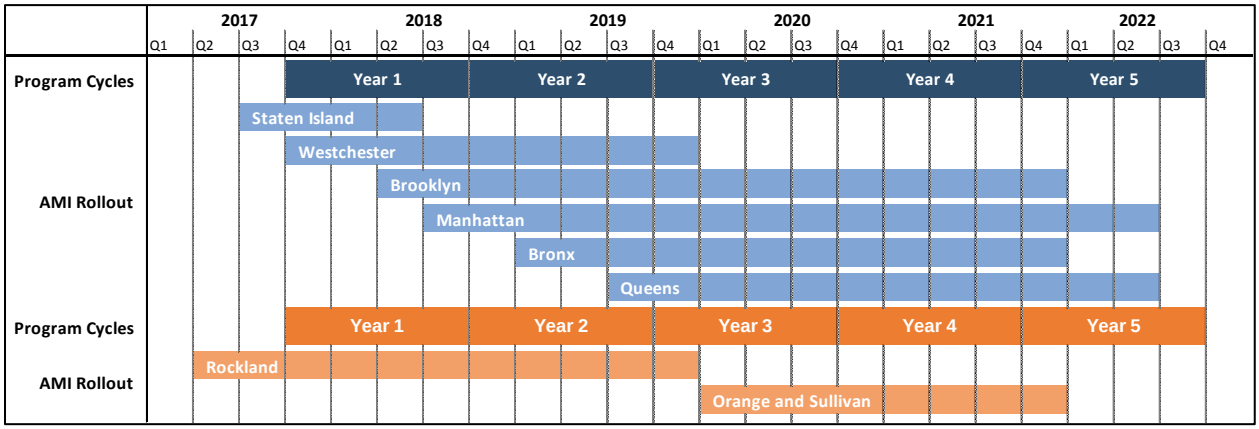
At the end of the pilots, customers enrolled in the new demand rates will receive messaging explaining their choices. These customers will have the option to return to another rate at that time. If their trial rate will be offered moving forward, they may also choose to continue on the rate.

6 New Cost Saving and Revenue Opportunities

The AMI Order states that there is the potential for, "…the Company to enhance its earnings by working with third parties who offer alternative solutions or deployment approaches that can reduce costs or generate new revenues, which will primarily benefit ratepayers, with an appropriate share of savings as an incentive for the Company."[78] The AMI Order then states that the "… customer engagement plan should propose a framework under which third parties can identify such opportunities; this framework should include a process for identifying, measuring, and sharing savings from such efforts."[79]

The Companies propose the following eligibility criteria and proposal process, to be conducted on an annual basis in each territory. The first program year will be 2018, and it will continue for the duration of the AMI implementation period (see Figure 6-1). The program will be reevaluated at that time to determine whether it should be continued and if so, what updates might be required. The program will have the objective of facilitating new cost saving and revenue opportunities directly related to the AMI network for customers, third party vendors, and the Companies.

Figure 6-1 High-Level Program Timeline Compared to AMI Rollout for Con Edison (blue) and Orange and Rockland (orange)



[77] For example, see CA SPP.
[78] AMI Order, Pg. 39.
[79] *Ibid.*

6.1 Eligibility Criteria

The first step in developing a framework, as requested in the AMI Order, is to define basic eligibility criteria for what is an acceptable project within the constraints of AMI network or business requirements, while remaining flexible enough to allow for creative ideas and approaches. These project eligibility criteria are divided into two subsets: proposal team criteria and project criteria.

6.1.1 Proposal Team Criteria

The following proposal team criteria will help identify organizations eligible to partner with the Companies to execute initiatives and projects that meet the goals in the AMI Order and REV more broadly.

6.1.1.1 New York-based

Proposal teams are encouraged to be based in New York State, having a local presence, to support local economic impact and job growth. A local presence also supports REV goals and helps to foster the success of a project by keeping service providers and customers close.

REV aims to “animate” markets and accelerate growth of innovation in New York State. New York-based requirements will result in outside vendors partnering with local entities that will realize some of the shared benefits from the project. This also gives local entities an incentive to identify opportunities from outside vendors and work to bring them into the program. Such vendors might not be aware of opportunities in the Companies’ territories otherwise. This has the potential to spur innovation in New York.

Local presence will be critical to the success of project implementation, since selected proposers would lead the execution of the project and integration on the network, with utility supervision and guidance. The level of management and coordination anticipated for these efforts will require someone on site at least part-time, which will be difficult for teams based remotely.

This preference is similar to one currently utilized in reviewing proposals for Con Edison’s REV Demonstration Projects.

6.1.1.2 Relevant Experience

The proposed team must be able to demonstrate experience developing similar projects resulting in successful outcomes. There is no set formula to determine the reasonability or similarity of previous experience. For proven technologies, this should include previous implementations, but for newer and more innovative technologies, this shall include demonstrations or implementation of similar technologies in the past. The type and level of experience necessary will vary with the type of project that is being proposed, and it will be evaluated during the review process. If the proposer has any doubts about the credentials of their team in this area, they should consider a partner that can help fill this gap.

This experience will be critical in successfully implementing project proposals to meet the goals outlined in the AMI Order. This criterion is similar to those established for proposals for Con Edison’s REV Demonstration Projects.

6.1.1.3 Demonstration of Ability to Meet Established Requirements for Credit, Investment, or Procurement

Preference will be given to project proposals that do not require funding from the Companies. However, those projects that require co-funding will not be precluded provided they meet the Companies' requirements. These projects must clearly demonstrate the amount requested and expected returns to all parties in their business case. Modeling for returns should be appropriately risk adjusted and comparable to similar investments. For guidance, see the Benefit-Cost Analysis Handbooks included as appendices with the Initial Distributed System Implementation Plan ("DSIP") filings for Con Edison[80] and Orange and Rockland.[81]

All projects vetted by the Companies will need to comply with applicable procurement and credit requirements of the Companies. Vendors will be required to complete a vendor qualification application, which requires potential suppliers to submit general information about their company including, by not limited to, company history, types of goods and/or services they are able to supply, and references. The application requires inclusion of sufficient documentation to verify financial viability through the submittal of three-years of certified financial statements or other sources of information such as D&B reports. Prospective suppliers will also be required to submit a completed Disclosure form. Certain services may require a review by members of the Companies' Environmental, Health and Safety organizations to verify the information contained in the supplier's health and safety plan. The Vendor Qualification Application for Con Edison may be requested at https://apps.coned.com/Supplychain/vqq/default.aspx. More information about the requirements for each of the Companies will also be provided with the solicitation.

6.1.2 Project Criteria

The following criteria establish the boundaries for the types of technology and projects that can be proposed under this program. If a project does not meet these requirements, interested parties should also explore the possibility of submitting it as a REV Demonstration Project or through Energy Efficiency or other appropriate programs offered by the Companies.

6.1.2.1 Use the AMI Communication Network

Given that this program is established to help identify new AMI opportunities and there are already programs to select and implement other technologies (e.g., REV Demonstration Projects), the Companies will limit proposals under this program to those that use the AMI communications network. Any projects proposed in a given cycle should consider the rollout of the communications network to determine if a particular geographic area is eligible (see Figure 6-1). Silver Spring Networks ("SSN"), is working with the Companies to identify a number of potential network opportunities. Some ideas proposed on other AMI networks include:

- Methane detection,
- Smart Streetlights,

[80] Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Con Edison's Distributed System Implementation Plan (DSIP) (filed June 30, 2016) (Con Edison DSIP).
[81] Orange and Rockland DSIP.

- Stray Voltage Monitoring,
- CO Sensors and Alarms,
- Water AMI,
- Water and Wastewater SCADA,
- Water and Wastewater Critical Alarms,
- Railway Crossing Signal Status or Crossing Status,
- Steam Pressure, Temperature, and Flow Measurement,
- Gas Pressure and Flow Measurement,
- Manhole Water Level Detection,
- Parking Garage and Parking Lot Vehicle Counts,
- Parking Meters and Parking Kiosks,
- Leak and Spill Sensors,
- Roadway Traffic Monitors,
- Vending Machine Status, and
- Urban Noise Detectors.

6.1.2.2 Comply with Network Technical Specifications[82]

While both Con Edison and Orange and Rockland are building AMI networks designed to meet their respective data needs they will be subject to many of the same constraints as other AMI networks.

AMI networks are designed to efficiently and securely communicate with meters and other sensor devices. Even the most robust AMI networks have relatively small bandwidth compared to cellular data and Wi-Fi networks. For example, low latency and high throughput applications such as Internet connectivity or streaming data are not well-suited to AMI networks.

Any new use of the network must not interfere with its primary purpose for transmitting energy usage and sensor data. Uses that require long periods of open network time (or latency) will interfere with this, and thus will not work; and time-sensitive uses of the network are also prevented because they interfere with the transmission of energy data.

Proposers should consider the difficulty of justifying investments to expand networks or incur significant incremental costs to enable additional network uses. Given the availability of relatively inexpensive alternatives such as cellular networks, other utilities have had difficulty developing a business case for these investments.

[82] The Companies would be willing to share non-sensitive technical specifications with entities whose project qualifies and have an executed Non-disclosure Agreement ("NDA").

6.1.2.3 Cost Saving or Revenue Opportunities for All Parties

The proposer must demonstrate the costs and benefits of the proposed project in a business case that accompanies the submission (see details in Section 6.2.2.2). In addition to evaluating the net benefits of the projects, the business case must do so for all parties (at a minimum to include customers, the proposal team, and the utility). Qualitative benefits, or those that are difficult to quantify, can be accounted for in the assessment. For guidance on including those, see the REV Order Establishing the Benefit Cost Analysis Framework[83], and more specifically the Benefit-Cost Analysis Handbooks included as appendices with the Initial Distributed System Implementation Plan ("DSIP") filings for Con Edison[84] and Orange and Rockland.[85] Depending on the nature of the project, the guidance in the Platform Service Revenues ("PSR") section of the *Order Adopting a Ratemaking and Utility Revenue Model Policy Framework* may also provide guidance on benefit allocation and project criteria[86] (See Section 6.2.5 for further discussion of potential PSR application in the Selection process).

6.1.2.4 Project Must Adhere to Existing Laws and Regulations

Projects must adhere to applicable laws and regulations for communications networks, AMI, or any other area related to the proposed network use. It will be incumbent on the proposing team to ensure that the project does not violate any such laws or regulations before the proposal is submitted. While the applicable laws and regulations will vary from project to project, the following, which is not meant to be an exhaustive list, should be considered:

- **FCC regulations governing communications networks:** Projects should review Title 47 - Telecommunication[87] for all communication networks.[88]
- **PSC regulations governing AMI systems:** See for example, Proceeding on Motion of the Commission to Consider Regulatory Policies Regarding Smart Grid Systems and the Modernization of the Electric Grid (10-E-0285)[89] that examined AMI and network regulation, though no formal rules were adopted.

[83] Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Establishing the Benefit Cost Analysis Framework (filed Jan. 21, 2016). (REV BCA Framework).
[84] Con Edison DSIP.
[85] Orange and Rockland DSIP.
[86] Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (filed May 19, 2016). (REV Track 2 Order). Pgs. 40-53.
[87] Electronic Code of Federal Regulations, Title 47 Telecommunication, available at: http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title47/47tab_02.tpl.
[88] For a specific example of FCC enforcement or regulation of a Silver Spring AMI Mesh Network, see https://apps.fcc.gov/edocs_public/attachmatch/DA-09-27A1.pdf.
[89] Case 10-E-0285, Proceeding on Motion of the Commission to Consider Regulatory Policies Regarding Smart Grid Systems and the Modernization of the Electric Grid.

6.1.2.5 Project Must Comply with the Companies' Cybersecurity Policies and Best Practices

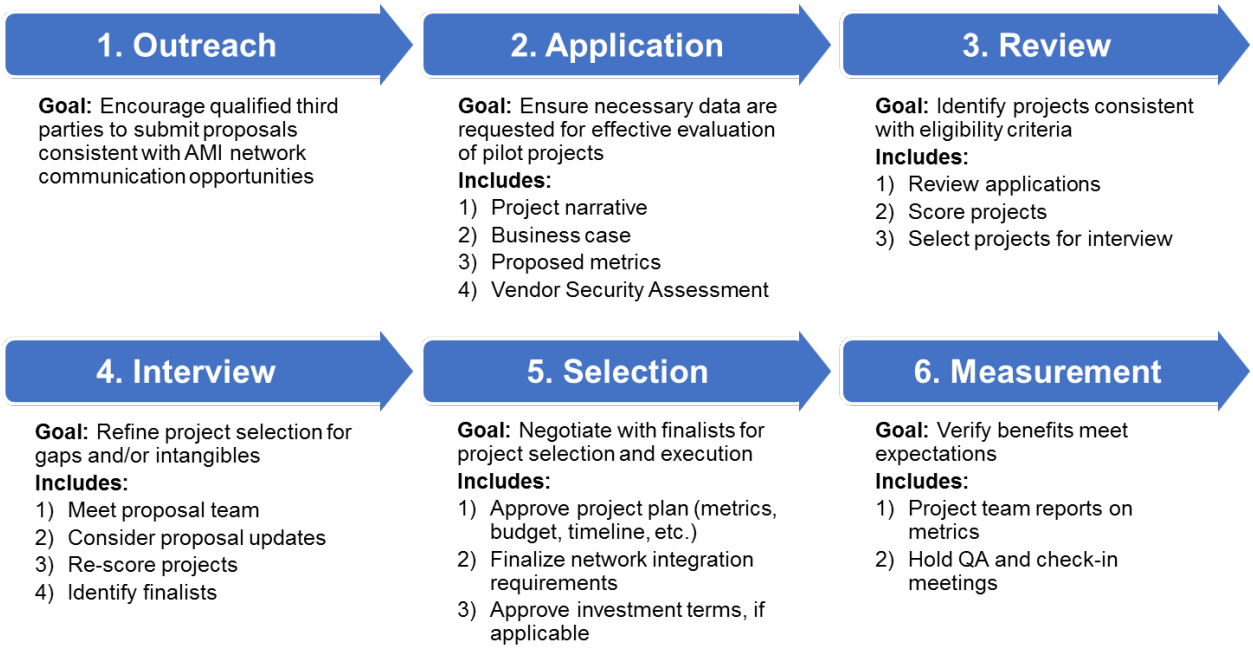
Any use of the AMI network must comply with the Companies' Information Security Policy. The best tool to help in identifying potential areas of concern for a potential project is the Vendor Product/Service Security Assessment Checklist. This will be included as part of annual solicitations, and a complete copy will be required with all submissions.

6.2 Proposal Process

As described in the introduction, the project opportunity solicitation will be offered annually, until the AMI rollout is completed. Figure 6-2 notes the six steps in the proposal process, which are described in more detail below.

The overall goal of this solicitation process is to identify those AMI network projects that have the potential to bring the greatest benefit to all stakeholders. Further, the number of projects that can be deployed using the AMI network may approach a limit, so another goal of the process is to ensure that any projects that reach implementation bring the maximum possible benefit.

Figure 6-2 Six Stages of the Solicitation Process



6.2.1 Outreach (Fall of Previous Year)

The goal of the outreach stage is to encourage qualified third parties to submit proposals consistent with AMI network communication opportunities and the criteria outlined above. Outreach will be conducted via annual solicitations developed based on experience with those for REV Demonstration Projects. In 2017, a web site will be developed with program information, where proposals can be

submitted, together with a marketing plan with details about messaging and outreach channels. Each year thereafter, the marketing plan will be updated based on lessons learned from the prior solicitation and any further definition of the potential AMI network project opportunities.

6.2.2 Application (Early Q1)

The goal of the application stage is that proposers submit all necessary data for the Company's effective evaluation of pilot projects. Applications will be accepted via the web portal, which will feature an application form with a series of questions about the proposal team and project that will summarize key attributes that are detailed in the other sections. The online form will then allow proposers to attach the following application materials. If the following materials are completed and submitted in a timely manner, the application will successfully move to the next stage, review.

6.2.2.1 Project Narrative

The application should include a project narrative with the following (at a minimum):

- Details about project team members and organizations (with focus on relevant experience and references)
- Details about the proposed project, including location, timeline, impacted customers and stakeholders
- Discussion of the value proposition, especially the problem resolved and description of any unquantifiable or unassignable benefits (with special attention to those that further REV goals) that are not captured in the business case
- If the project team is requesting funding from the utility, this section must further explain the form of the funding and partnership, how the funding will be used, and the anticipated return on investment (ROI), which must be supported in the attached business case. The proposers should also include proof of compliance with applicable credit, investment, or procurement requirements for the utility as described in Section 6.1.1.3.
- The narrative should further include any assumptions or potential project risks that could impact the business case and net benefits for different parties (including an assessment of how each party could be impacted by variations in assumptions, and mitigations considered for these risks).
- The narrative must include a description of how the benefits from the opportunity will be allocated among all relevant stakeholders (the proposing organizations, utility customers, and the utility).

6.2.2.2 Business Case Analysis

The business case should follow a standard benefit-cost analysis, with key financial metrics of the project's incremental costs and benefit streams. These must be demonstrated for the project as a whole, but also for each of the relevant parties (*e.g.*, customers, proposal team and vendors, and the utility). If additional payments between parties are required to balance benefits, these must be demonstrated clearly in the model. The guidance in the PSR section of the *Order Adopting a Ratemaking*

and Utility Revenue Model Policy Framework may provide guidance on benefit allocation that proposers may use in developing this portion of their business case.

Key details and assumptions must be readily identifiable (e.g., discount rates, investment periods, and usable lives of assets). These should be configured in such a way that they can be easily changed to test sensitivities of outputs to key inputs.

For guidance, proposers may use the REV *Order Establishing the Benefit Cost Analysis Framework*,[90] and more specifically the Benefit-Cost Analysis Handbooks included as appendices with the Initial DSIP filings for Con Edison and Orange and Rockland.

6.2.2.3 Proposed Project Metrics

Because each proposal will have unique goals and approaches to meeting them, their respective metrics will likely be very different. Therefore, each proposal submission should include a set of suggested metrics that can be used to determine success if selected. These should be specific, time-bound, and measurable. Final metrics will be determined as part of a negotiated process after a project is selected. Some metrics to consider include the following:

- standard financial metrics (especially those described in the Benefit-Cost Analysis Handbooks),
- realization of any anticipated unquantifiable benefits,
- number of participating or positively impacted customers,
- impacts on bandwidth, latency, and uptime of the AMI network, and
- meeting or exceeding project implementation deadlines.

6.2.2.4 Completed Vendor Product and Service Security Assessment Checklist

The checklist would be provided with the solicitation, posted on the website when constructed, or both.

6.2.3 Review (6-9 Months in Duration)

The goal of the review stage is to identify proposed projects consistent with eligibility criteria, which are thus most likely to succeed in utilizing the AMI network to bring value to customers, proposers, and the utility. Members of the appropriate teams within the Company (based on the project proposal type) will review proposal documents individually, selecting those that best meet the desired project criteria. The reviewers will then meet to discuss their individual assessments, and come to a consensus on which proposal teams to invite to interview during the period.

6.2.4 Interview (Included in Review Duration)

The goal of the interview stage is to meet with the most promising proposal teams to learn more about their projects and fill in any gaps in the proposal materials or learn more about any intangibles so the Company can better assess proposals and select finalist(s). The proposal team will travel to the Company to meet with appropriate staff members to discuss their project in further detail. The proposer may amend their proposal at this time as well, providing updated materials to reflect these changes and

[90] REV BCA Framework.

giving a presentation to summarize the changes during the meeting. After the meeting, the Company reviewers will again assess the projects and select finalist(s) to advance to the next stage.

6.2.5 Selection

The goal of the selection phase is to negotiate with finalist(s) to reach an agreement that allows for project execution. The outcome of this stage will be a signed agreement between the parties with a clear project plan and metrics. This stage will include:

- negotiating and approving a final project plan (including final project metrics, budgets, and timelines);
- a final review of network integration requirements for compatibility, safety, and security of the project;
- a negotiation of any investment terms, if the Company has agreed to provide debt or equity financing; and
- executing the final project agreement.

As previously described, certain projects may be considered to fall under the Platform Services Revenue ("PSR") requirements of the *Order Adopting a Ratemaking and Utility Revenue Model Policy Framework*.[91] As such, it may be necessary to follow the PSC approval process which requires a tariff filing with the components and details outlined in that Order. In general, the Companies believe that these projects will be most similar to those undertaken for REV Demonstration Projects. The details of any agreement, including the negotiated revenue share with the utility, should be treated as confidential in nature to encourage third parties to submit proposals.

6.2.6 Measurement (Timeframe Determined for Each Project)

The Companies do not anticipate direct involvement in implementation beyond any direct network interventions that will require their staff to be involved. Since the project teams will be operating independently for the most part, it will be important to monitor progress to verify that project metrics and goals are met. Such monitoring will occur through:

- project team reports on metrics and performance (duration and frequency based on project type and terms), and
- Quality Assurance ("QA") check-in meetings with utility representatives (duration and frequency based on project type and terms).

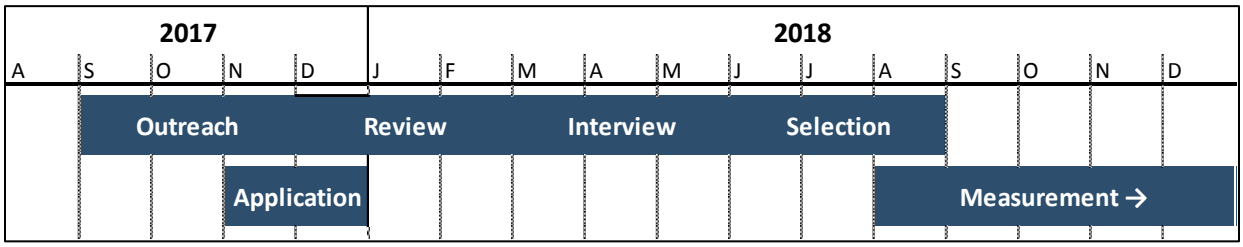
6.3 Draft Program Timeline: 1 Year

Figure 6-3 below illustrates the calendar activities for the six steps in the proposal processes to be undertaken during the first year of the program, and repeated each program year until the AMI roll-out is completed. Outreach will be initiated in the fall of the previous program year. Applications will be reviewed upon submission, with the review and interview process expected to take six months, depending on the number of applications received. The objective is to have the necessary components

[91] REV Track 2 Order, pgs. 40-53.

of the selection phase completed by the Companies' mid-year budget cycle. Thereafter, quality assurance and monitoring of the projects would take place so that they are successfully implemented and the benefits realized.

Figure 6-3 Draft Timeline for First Program Year



7 Smart Meter Opt-Out

Con Edison's AMI implementation will result in the availability of granular customer energy usage data, which has prompted potential privacy concerns for customers. For example, some groups have postulated that granular energy usage data might reveal a customer's behavior and habits at home, or indicate whether or not a premise is occupied. Several considerations are taken into account in Con Edison's AMI plan to protect the privacy and security of its customer energy usage data (e.g., encryption of data, use of firewalls, physical security, privacy policies and procedures). Despite these efforts, customer concerns over data privacy may still remain, motivating some customers to opt out of receiving a smart meter during the Company's AMI implementation.

Although Con Edison currently has an automated meter opt-out tariff in place for both electricity and gas customers, it places limitations on who is eligible to opt out, and will require further amendments in order to provide a solution for those customers wishing to opt out of AMI for security and privacy reasons. Consistent with the Commission's March 2016 request[92] for Con Edison to "file further tariff amendments proposing a solution or solutions for customers who wish to opt-out of AMI when it makes its customer engagement compliance filing," Con Edison proposes the following AMR/AMI Opt-Out Tariff amendments in order to provide customers with the choice to participate in the AMI program.

7.1 Current AMR/AMI Opt-Out Tariff

7.1.1 Eligibility

Under the current tariffs,[93] the terms and conditions under which Con Edison's electric and gas customers are allowed to opt out of an automated meter (i.e., AMR or AMI) are currently limited to only those customers residing in one to four family homes. In a December 2015 ruling,[94] the Commission commented that Con Edison's proposed limitation of opt-out to one to four family homes was sufficient

[92] Case 15-E-0050 Order Approving Advanced Metering Infrastructure Business Plan Subject to Conditions
[93] General Rule 6.10; General Information Section III.8(W)
[94] CASE 14-E-0570 Tariff Filing To Establish General Rule 6.10 - AMR/AMI (Automated Meter Reading/Advanced Metering Infrastructure) Meter Opt-Out Contained In P.S.C. No. 10 - Electricity

to address any potential health concerns that may arise with respect to AMR meters. Nevertheless, Con Edison's opt-out program must also be able to address customer privacy and security concerns raised by AMI meters, including customers residing in multi-family buildings.

7.1.2 Cost

Electric and gas customers wishing to opt-out of an automated meter are subject to an incremental monthly charge of $9.50 per account for manual meter reading, as specified in General Rule 17.1.f. and General Information Section IV.3.(b) (electric and gas respectively).

In the event of a previous installation of an electric AMR or AMI meter, customers wishing to opt out are required to pay a one-time fee of $104.74 for each meter change-out (i.e. removal of an AMR or AMI meter and installation of a solid-state non-communicating meter). Similarly, gas customers wishing to opt out are required to pay a one-time fee of $93.81 per meter for the removal of the remote communications capability of a previously installed AMR or AMI meter.

7.1.3 Responsibility

According to the current electric and gas opt-out tariffs, Con Edison is required to notify customers in writing at least 30 days in advance of the AMR or AMI meter installation. Otherwise the Company cannot charge customers a one-time fee to remove a previously installed automated meter.

Customers who wish to participate in the electric or gas opt-out program are required to submit a completed AMR/AMI Meter Opt-Out Application Form. Once enrolled into the program, customers must allow Con Edison regular access to their premises for bi-monthly manual meter reads. Additionally, Customers who opt out of AMR/AMI metering and thereafter have two months of estimated bills in a 12-month period due to no access to the meter will be required to furnish, install, and maintain the facilities necessary to accept outdoor meter(s) or provide access to the Company to install, or re-install, as applicable, an AMR/AMI meter.

7.2 Proposed Solutions

In order to address customer security and privacy concerns over AMI customer energy usage data, and to remain consistent with other utilities including Orange and Rockland, Con Edison proposes extending its current electric and gas opt-out tariffs to include all residential customers. The proposals for the tariffs' eligibility, cost, and responsibility specifications are detailed below.

7.3 Proposed Tariff Amendments

7.3.1 Eligibility

The terms and conditions under which Con Edison's electric and gas customers are allowed to opt out of an automated meter (i.e., AMR or AMI) will be extended to all residential customers.

7.3.2 Cost

Manual meter reading fees and one-time meter change-out fees are expected to remain the same as these activities remain relatively unchanged (i.e., manual meter reading and meter replacement). Con Edison will also clarify in its updated tariff that the manual meter reading fee is the same for those

customers with a combined electric and gas account. Lastly, Con Edison retains the right to revise opt-out fees as necessary to accurately reflect opt-out service costs that may change over time.

7.3.3 Responsibility

Utility and customer responsibilities are expected to remain the same under this proposed amendment.

8 Local Law 84

Local Law 84 ("LL84") requires buildings in New York City ("NYC") meeting certain size, use, and ownership designations to benchmark their energy and water use, and report the results to the City via ENERGY STAR® Portfolio Manager®. There were approximately 12,627 properties (with 19,296 buildings) on the Covered Buildings List for 2016.[95] The law is meant to spur improvements in the energy efficiency of buildings by informing owners how their performance compares to that of similar buildings.

The AMI Order references two requests made by New York City:

- "The City requests that the Company be directed to investigate barriers and solutions [to automating the data exchange] and file a report on the outcome of its investigation..."[96]
- "NYC also notes that its proposal to automate the data exchange should allow the Company to stop charging customers $102.50 per tax lot to provide the data needed by the customer to comply with LL84."[97]

While assessment of these items is not included in the Order, Con Edison has undertaken this review of the internal costs of providing data, and how proposed changes to automate the exchange of data with Portfolio Manager® compare in terms of internal costs to Con Edison and impacts on processes and customers. The cost to customers is not assessed as part of this filing, and will be addressed separately in the current rate case.[98]

The key issues and findings from the assessment are:

- Automation and process improvements within Con Edison have now reduced the cost per aggregated building data request under LL84 from $102.50 to approximately $44.07.
- Whether developed in-house by Con Edison or provided by an external vendor, automating the data connection to Portfolio Manager® does not lower the utility's costs for tracking requests and authorizations, aggregating data, and then providing it. Indeed it adds cost since it shifts reporting to Portfolio Manager® from the customer to the utility. Development of in-house APIs to connect to Portfolio Manager® would add approximately $13.25 to the cost of each transaction, while a vendor solution suggested by the City would increase this by at least $25.58

[95] NYC Mayor's Office of Sustainability. "Compliance Instructions." Available at http://www.nyc.gov/html/gbee/html/plan/ll84_comply.shtml.
[96] AMI Order, pg. 10.
[97] *Ibid.*
[98] Case 16-E-0060, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service.

per transaction. In spite of the added costs to automating the data exchange, there is value to customers.

- These are estimates for the cost per request for aggregate data. The recovery mechanism and fees (if any) are being determined separately in Con Edison's current electric and gas rate cases, Cases 16-E-0060 and 16-G-0061. Appropriate tariff changes will be filed to General Rule 17.5 of PSC No. 10 – Electricity and General Information Section IV.3(c) of PSC No. 9 – Gas as determined in the current rate cases.

Proposed changes to LL84 from the Mayor's Office will expand the requirement to include all buildings over 25,000 square feet (instead of 50,000). This will add 11,400 properties (16,800 buildings) to the Covered Buildings List[99], further complicating processes and increasing costs for all scenarios.

8.1 Current Cost Assessment

8.1.1 Original Process and Costs

When Local Law 84 was enacted in 2010, there were no existing processes or systems in place at Con Edison to track the requests or to process and provide the aggregated data to building owners. Every step of the process (e-mail, account look up, pulling consumption data and compiling it, tracking, and payments processing) was tracked and completed manually by Con Edison staff members. The associated costs of providing aggregated data were thus entirely driven by labor. As described in Leaf 128 of Con Edison's tariff, the $102.50 cost per request is based on the hourly cost of Con Edison labor to process and fulfill requests.[100]

8.1.2 Current Cost Estimates

8.1.2.1 Automation and Process Improvements

In the course of fulfilling aggregated data requests over seven annual benchmarking cycles, Con Edison has worked to automate processes whenever possible, and to continually improve them for efficiency and customer experience when not possible. Many of these have improved the quality and completeness of the data reported as well. The following list outlines automations and other changes that have been implemented to this end:

- Process Automation:
    - Letters of Authorization (LOAs): Before aggregated data can be provided, an LOA must be submitted to Con Edison by the building owner. This process was previously required annually, but Con Edison in 2014 developed a tracking system that allows letters to be saved and reused for the same building and owner over many years. This improves the customer experience and lowers the cost of processing and tracking LOAs each year.
    - Project Center: Requests for aggregated data can now be made by submitting Con Edison's Aggregated Consumption Request Form via Project Center, a web application

[99] NYC. "Policies and Programs" available at http://www.nyc.gov/html/builttolast/pages/policies/policies.shtml.
[100] P.S.C. 10 - Special Services Performed by the Company at a Charge – http://www.coned.com/energyefficiency/PDF/tariff-filing.pdf.

managed by Con Edison for submitting and tracking customer requests. This allows for better request tracking, streamlining processes and making more timely responses.

- Reporting: The reporting of aggregated data has been automated via an external vendor, which streamlined the processes, thus lowering costs.
- Billing: The billing process was outsourced to a vendor that automated tracking and processing, improving customer experience and lowering cost.

- Process Improvement:
  - Process Mapping: Con Edison conducted a detailed process mapping exercise in 2014 to document changes and identify new opportunities for improvement (see Figure 8-1). One of the opportunities for improvement identified through this exercise was shifting reporting from the building level ("BIN") to the block and lot ("BBL") level, as described below.

Figure 8-1 High-level Process Map for Major Process Stages

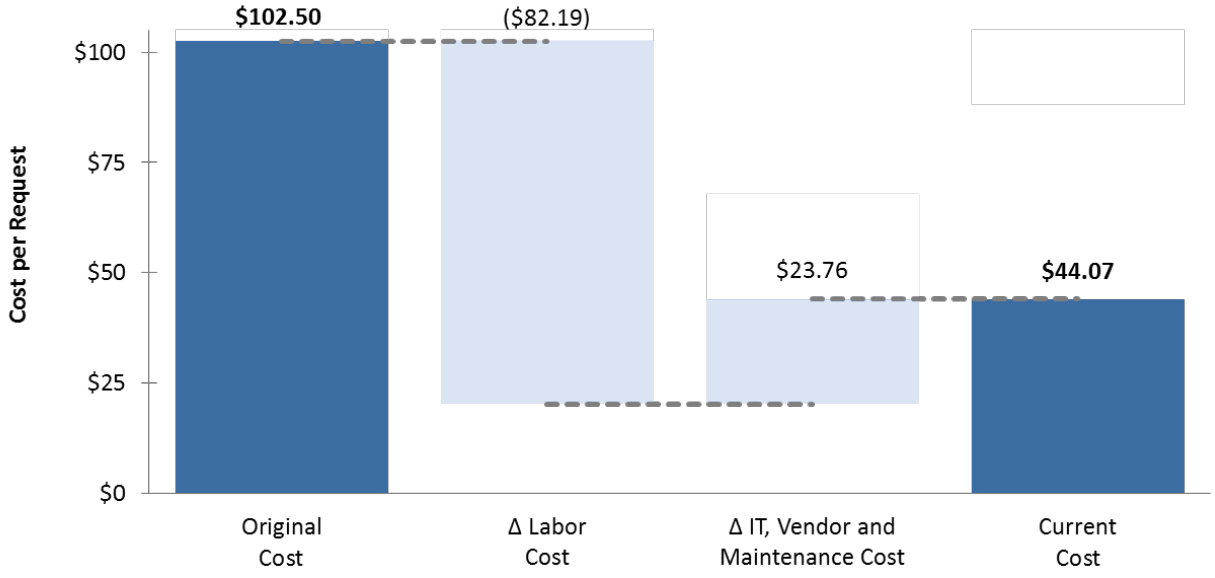
- MS Excel Macros and MS Access Databases: For those processes that are tracked and logged internally, the process was manual in Excel. Over time, macros and databases have been developed to allow for better tracking and retrieval of information.
- BBL vs. BIN: In 2015, Con Edison began providing aggregated data by block and lot rather than by building. Since each block and lot can contain more than one building, this reduced the number of requests and costs for many building owners. It further improved the accuracy of aggregated energy data by better matching all of the service addresses to the appropriate BBL.
- FAQs: E-mails and phone calls with questions are the largest contributor to employee time required for aggregated data provision following automation and outsourcing of many of the processes. This has been reduced through the development and introduction of a detailed web page and FAQs.[101]
- Extended Data Length: Extended the timeframe to include historic data up to three years rather than just two for building owners behind on compliance.

[101] Con Edison. "Greener Greater Buildings Plan – Benchmarking" available at http://www.coned.com/energyefficiency/city_benchmarking.asp.

8.1.3 Impact on Costs

The automation and process improvements described have decreased the average amount of time per request and the number of internal staff required for processing and fulfilling aggregated data requests. The number of dedicated full time employees ("FTEs") has fallen from a high of six to eight in the first year to two plus support staff time in 2015, which translates to a decrease of $82.19 per request (see Figure 8-2).

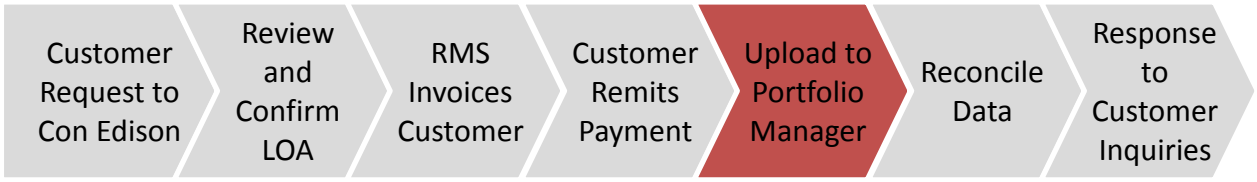
Figure 8-2 Assessment of Cost Changes



8.2 Automating Data Connection to Portfolio Manager

Con Edison evaluated two solutions to automate the connection of data to Portfolio Manager®: in-house development of APIs and a vendor solution recommended by the City. This section describes the pros and cons of each and details the estimated cost per data request for each solution. Uploading the data to Portfolio Manager® would not significantly eliminate or alter any of the steps in Con Edison's internal process (See Figure 8-3). This automation adds costs and increases the cost per request, but it will also add value for customers by further facilitating the benchmarking process and eliminating costs associated with outside contractors and will help expedite the processing of the same requests in subsequent years.

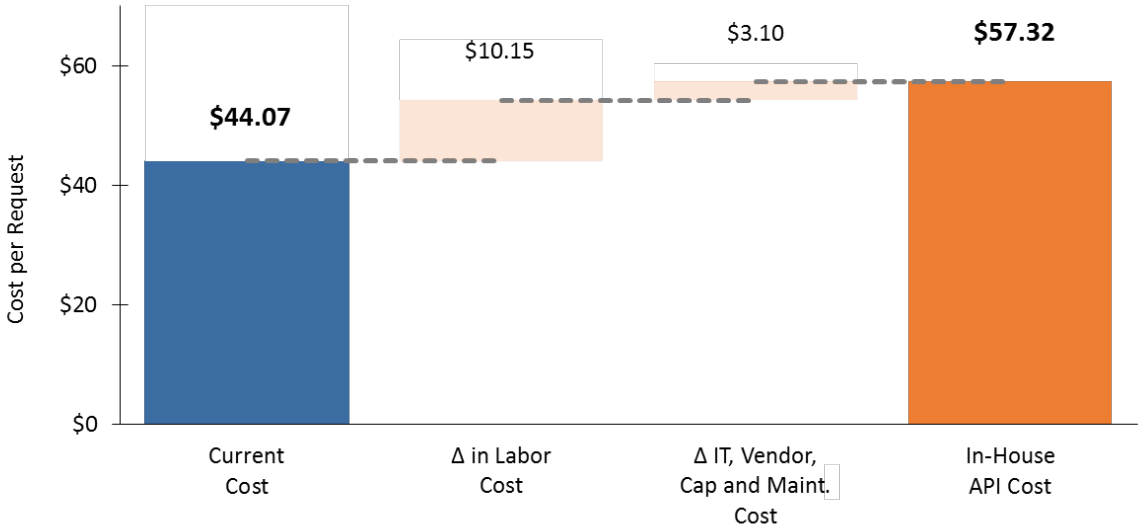
Figure 8-3 High-level Process Map for Highlighting Changes from Automation



8.2.1 In-house Solution

The first solution under consideration is the internal development and implementation of a web service interface to upload aggregated data to Portfolio Manager® as described in the Capital White Papers Reforming the Energy Vision (REV) in the Con Edison Electric rate Case – 16-E-0060.[102] The estimated costs for this solution are "$425,000 [upfront] with total ongoing maintenance over the following two years estimated at an additional $225,000."[103] The increased cost per request would be $13.25 ($10.15 + $3.10) in 2018 (see Figure 8-4).

Figure 8-4 Assessment of Cost Changes for In-House Solution (2018)



Of this increase, $10.15 would be driven by changes in the cost of labor per request (assuming these are distributed over the same number of requests – 10,000 – as were received in the most recent benchmarking year), which include estimates for the incremental labor costs for process transitions,

[102] Case 16-E-0060, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric, Exhibit EIOP-1. Available at http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={3E663CAC-B115-46F6-B958-937ACCEA7AFD} .
[103] *Id*., Pg. 7.

additional requestor questions and support, and a portion of the ongoing maintenance costs for the first year as outlined in the rate case filing. In total, this additional labor would bring the estimated labor up to 1.5 FTEs in the first year at the hourly rate outlined in Leaf 128 of Con Edison's tariff.[104]

8.2.2 Vendor Solution

Con Edison further assessed a solution recommended by the City that has been developed by a third party vendor to automate this data upload process. The vendor offers a Software as a Service ("SaaS") platform that can be used to take in aggregated data requests for benchmarking and upload data directly to Portfolio Manager®. The vendor quoted costs to Con Edison based on the number of buildings that would be using the system. The costs were divided into upfront setup fees and ongoing monthly fees.

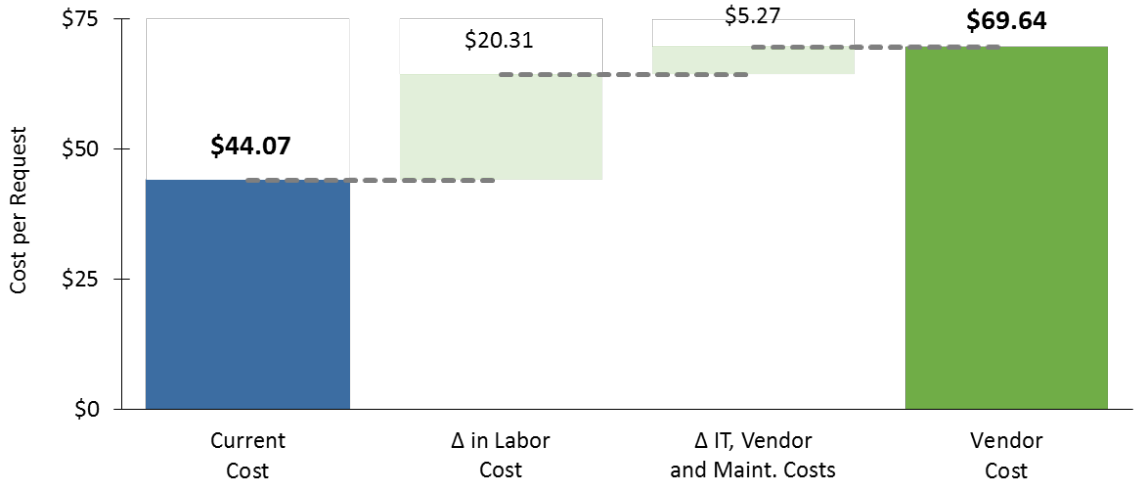
In meeting with the vendor to discuss the pricing and assumptions behind it, Con Edison determined that these costs would be significantly higher than the original estimates based on the definition of buildings (BBL vs BIN) and the need for Con Edison to include data for electricity, gas and steam (the quotes were just for electricity data).

Moreover, while the SaaS platform could replace or modify some portions of the current processes behind aggregating data, it would not eliminate tracking and verification of requests and LOAs. The vendor further indicated that they would require regular meetings to review and resolve any data exceptions, which would add a step to the process and increase the cost of labor per request. Finally, while the SaaS solution could be used to manage the request process for a utility that was just starting to provide aggregated data, it is not appropriate for Con Edison given the level of automation that has already taken place and the familiarity customers have with the current processes. Dismantling these and implementing a new solution at this point would discard systems that have already been developed and represent a sunk cost, and it would further drive up labor costs in the first year (2018) given the effort required to shift systems and the anticipated increase in questions from customers that would follow.

As depicted in Figure 8-5, the vendor costs would increase with the implementation of the vendor solution.

[104] P.S.C. 10 - Special Services Performed by the Company at a Charge.

Figure 8-5 Assessment of Cost Changes for Vendor Solution (2018)



The estimated increase in labor costs in the first year would be approximately $20.31 per request (again assuming that the number of requests remains at approximately 10,000 in 2018). This estimate assumes two total FTEs in the first year, which would increase costs over those for 2015 by $20.31 per request. The additional labor time would be necessary to:

- implement changes in workflow and processes to accommodate the new system,
- answer anticipated requestor questions about the changes in the process and interface, and
- manage vendor requests and questions (e.g. vendor stated they would require bi-weekly data exception meetings).

The net change in vendor costs in the first year would be an increase of $5.27 per request. This assumes some cost reductions for current vendors and IT maintenance as they are phased out, but those reductions would be more than offset by the increase in estimated monthly costs from the vendor. In total, the changes will lead to an estimated increase of $25.58 in the cost per request in 2018.

8.2.3 Comparison of Solutions

The estimated costs of the in-house solution are lower than those for the vendor solution, but there are other qualitative aspects of each solution and the impact on customers that should be considered as well. Ultimately, the two solutions would offer automated uploading of data to Portfolio Manager® and a similar improvement in experience from the customer perspective (aside from the short-term disruption unique to the vendor solution that was previously described). The vendor solution does have some qualitative advantages in terms of previous implementation at other utilities and existing support staff and instructional materials for users. However, that support staff is outsourced overseas, and with that outsourcing come added concerns about the privacy and security of customer data. Finally, the vendor indicated that they would include solicitations for third-party services and products as part of the SaaS platform. Using customer data to tailor the sale of products and services on a platform branded under Con Edison is a significant concern for the customer experience and the possibility that outside parties could be misled into construing this placement as a product endorsement from Con Edison.

Ultimately, given the lower costs and the advantages in customer experience and data protection, the in-house solution is the preferred option for both Con Edison and customers.

9 Submetering

The Commission ordered Con Edison to address concerns for submetered tenants' ability to benefit from AMI, voiced by the Pace Energy and Climate Center ("PACE") and the Association for Energy Affordability ("AEA"):

- "PACE also believes the Company should procure master-meters for multi-family buildings that are capable of working with the associated submeters so that all customers can engage with their data."
- "AEA suggests that Con Edison's AMI implementation should address issues related to the fact that customers in multi-family buildings may be submetered, which limits customer access to the DER marketplace."
- "PACE suggests that the AMI system should also be capable of communicating with submeters…"[105]

To address these concerns, Con Edison spoke with third-party submeter manufacturers, software providers, and consultants to document the AMI-enabled benefits available to submetered tenants. This section describes the benefits that submetered tenants will experience upon AMI deployment, and the range of additional benefits that third-party submeter companies may offer.

9.1 Background

Within Con Edison's service territory, there are 3,338 master metered multi-family buildings. Though Local Law 88 requires each of these buildings to be submetered by 2025, only a percentage of these buildings are submetered today. Submetering companies provide a range of products and services, including:

- submeter hardware,
- submeter installation,
- energy procurement,
- billing services, and
- energy management solutions.

The capabilities of these products and services vary among submeter companies. For example, the submeter hardware of one company may include an IHD that displays energy usage at fifteen-minute intervals, while another company's hardware consists of the submeter only (no IHD). The billing services of one company may include an online portal for tenants to pay bills, while another company mails an aggregated bill to a building that must be distributed among tenants. The energy management solutions

[105] The AMI Order

of one company may include a report for the building with insights based on an analysis of tenants' energy usage, while another company does not provide energy management solutions.

The following sections discuss the extent to which submetered tenants will experience benefits from Con Edison, and how enhanced benefits can potentially be provided by third-party submeter companies.

9.2 Benefits from Con Edison's AMI Rollout

Con Edison's AMI rollout will enable submetered tenants to experience cost savings, improved outage response, and health benefits from reduced greenhouse gas (GHG) emissions. These AMI-enabled benefits result from:

- Distributed Energy Resources (DER), which reduces the amount of fossil-fuel generated energy Con Edison must purchase and increases renewable energy usage, resulting in decreased GHG emissions.
- Conservation Voltage Optimization (CVO), which reduces the amount of electricity Con Edison must deliver to customers. Subsequently, Con Edison can purchase less fossil-fuel produced electricity, decreasing customer bills and greenhouse gas emissions.
- Remote meter reads, which enables Con Edison to:
    - provide cost savings to customers, due to significantly fewer truck rolls for manual meter reads;
    - respond to outages more quickly (submetered tenants will benefit when there is an outage that curtails power to the master meters of their buildings); and
    - reduce greenhouse gas emissions, due to fewer truck rolls from fewer manual meter reads.

In addition to submetered tenants, multi-family building tenants without submeters will also experience these benefits from Con Edison's AMI rollout. All cost savings that Con Edison master meters experience can be distributed among tenants when a building manager (or submeter company) allocates the master meter bill. Similarly, the improved outage response and the health benefit of reduced greenhouse gases are available to those with and without submeters. Con Edison's AMI rollout thus provides benefits not only to its direct metered customers, but also to those residents who are not its direct customers.

9.3 Benefits from Submeter Companies

Depending on the submeter company providing services to a multi-family building, tenants may already experience select benefits that direct metered Con Edison customers will receive from AMI deployment. Nevertheless, Con Edison's AMI rollout will provide third-party submeter companies with the opportunity to enhance the benefits they provide submetered tenants today. The next two sections distinguish the benefits currently available to submetered tenants from those benefits that may be available to submetered tenants due to AMI deployment.

9.3.1 Benefits Available Without AMI

Depending on the submetering services that a building manager purchases, submetered tenants may currently benefit from:

- Access to energy usage data for a tenant space, which submeter companies provide:
    - at varying levels of granularity, ranging from one minute to sixty minute intervals;
    - through a variety of channels, from mailed print reports to emails, and from online portals to IHDs; and
    - at varying frequencies, ranging from a monthly to a real-time basis
- Outage response for tenant spaces, which submetering companies recognize upon a lack of response from a tenant's submeter
- No estimated bills, because each tenant space will have a submeter monitoring energy usage for that space only

The next section explains how Con Edison's AMI deployment may enhance submetered tenants' experience of these benefits, depending on the capabilities of their building's submeter company.

9.3.2 Benefits Available With AMI

Con Edison's AMI deployment provides submeter companies with the opportunity to expand their services, enabling submetered tenants to participate in demand response and alternative rate programs. A submetered tenant's experience of these new services depends on the technology capabilities of their building's submeter company. During meetings with five submetering companies, Con Edison discussed the technology changes required for each company to enable the tenants of their submetered buildings to participate in these new, AMI-enabled programs.

Due to variations in hardware and software across the five submeter companies, the investment required of each company to enable participation in demand response and alternative rate programs varies. For example, one submeter company's existing technology transmits demand response signals received at the Con Edison master meter to IHDs, giving submetered tenants the choice to respond to signals represented with color-coded lights. This submeter company's technology will register tenants' responses to the signals, and the company will bill the tenants accordingly. Upon the installation of AMI meters at this submeter company's buildings, the associated tenants will be able to participate in AMI-enabled rate programs thanks to the company's existing web-based, wireless, submeter technology.

Conversely, in over half of the submetered multi-family buildings in Con Edison's service territory, the associated submeter companies' existing technology cannot communicate rate and demand response signals. While speaking with Con Edison, the four companies servicing these buildings expressed interest in updating their technology to enable submetered tenants to participate in AMI-enabled rate programs. Due to the technology variations across submeter companies, participation in alternative rate structures and demand response programs is possible but not guaranteed for submetered tenants.

During the meetings with the five submeter companies, Con Edison explored partnership opportunities to provide additional AMI benefits to submetered tenants utilizing the Companies' AMI network. While multiple opportunities were discussed, no partnership opportunities were readily apparent. As future opportunities arise, submeter companies can propose potential opportunities using the framework described in Section 6, New Cost Saving and Revenue Opportunities.

10 Data Privacy

The AMI Order requests a formal privacy assessment as recommended by the National Institute of Standards and Technology ("NIST") prior to commencing installation of AMI meters, as well as developing and documenting formal data access and privacy policies, called Fair Information Practice Principles. This section provides a summary of Con Edison's and Orange and Rockland's Privacy Assessment and Data Access Principles, to guide the Companies in updating their privacy policies in preparation for AMI rollout.

These two elements expand and complement the security and privacy activities the Companies already have underway and in place to safeguard customer information from unauthorized access or improper use. As noted in the Companies' Privacy Statement: "…energy delivery and customer service systems are part of the critical infrastructure of our nation, and we take our responsibility to protect our systems seriously. We work with our governmental and other partners to help protect our property and our nation." [106]

10.1 Data Privacy Assessment

The Companies perform regular audits, tests, and updates of customer information protection practices. This data privacy assessment, while not an audit, provides a focused review of the Companies' privacy protection policies and activities regarding AMI customer data.

As recommended by the Commission, this assessment is based on recommendations found in the National Institute of Standards and Technology Interagency Report (NISTIR) 7628 (Revision 1) issued in September 2014. This three-volume report, "Guidelines for Smart Grid Cybersecurity," ("Guidelines") provides an analytical framework for organizations to develop cybersecurity strategies tailored to each user's particular combinations of smart grid-related characteristics, risks, and vulnerabilities.

One of the features of the Guidelines is a privacy impact assessment framework for the smart grid that describes the areas that NIST recommends organizations deploying smart grid should consider. The impact assessment framework includes a discussion of mitigating factors and an overview of existing privacy risk mitigation standards and frameworks. This chapter and the related impact assessment framework provide detailed information and a list of recommended best practices that were used as the basis for this assessment. Detailed report completed by West Monroe provides more detail. [107]

The following sections describe the approach and framework used in the assessment and the key observations and action items.

10.1.1 Assessment Approach

West Monroe was contracted by the Companies to conduct a data privacy assessment. West Monroe was selected because of their experience in data privacy and security with other utilities. The assessment compared the NISTIR Guidelines to the Companies' existing privacy policies, procedures and the AMI implementation plan. This detailed review was conducted over eight weeks and included 20 internal workshops, dozens of stakeholder interviews in both Companies, review of over 140 internal

[106] Con Edison Privacy Statement (April 8, 2016); retrieved 6/25/2016 at http://www.coned.com/privacy/;
[107] The full report has been provided to the Companies but is not included due to confidentiality.

documents, industry benchmarking, and analysis of corporate data privacy policies, procedures, and previous and relevant Con Edison and Orange and Rockland audits.

The NISTIR recommendations are divided into 18 categories as summarized below.

1. Management and Accountability
    - **Assign privacy responsibility**. Each organization collecting or using smart grid data from or about customer locations should create (or augment) a position or person with responsibility to ensure that privacy policies and practices exist and are followed.
    - **Establish privacy audits**. Audit functions should be modified to monitor all privacy-related energy data access.
    - **Establish or amend incident response and law enforcement request policies and procedures.** Organizations accessing, storing, or processing energy data should include specific documented incident response procedures for incidents involving energy data.
2. Notice and Purpose
    - **Provide notification for the personal information collected**. Any organization collecting energy data from or about consumers should establish a process to notify customer account inhabitants and person(s) paying the bills (which may be different entities), when appropriate, in a clearly worded description of the data being collected, why it is necessary to collect the data, and the intended use, retention, and sharing of the data.
    - **Provide notification for new information use purposes and collection**. Organizations should update consumer notifications whenever they want to start using existing collected data for materially different purposes other than those the customer has previously authorized.
3. Choice and Consent
    - **Provide notification about choices**. The customer notification should include a clearly worded description to the recipients of services notifying them of (1) any choices available to them about information being collected and obtaining explicit consent when possible; and (2) explaining when and why data items are or may be collected and used without obtaining consent, such as when certain pieces of information are needed to restore service in a timely fashion.
4. Collection and Scope
    - **Limit the collection of data** to only that necessary for smart grid operations, including planning and management, improving energy use and efficiency, account management, and billing.
    - **Obtain the data by lawful and fair means** and, where appropriate and possible, with the knowledge or consent of the customer.
5. Use and Retention
    - **Review privacy policies and procedures**. Every organization with access to smart grid data should review existing information security and privacy policies to determine how they may need to be modified.

- **Limit information retention**. Data, and subsequently created information that reveals personal information or activities from and about a specific customer location, should be retained only for as long as necessary to fulfill the purposes that have been communicated to the energy customers. After the appropriate retention period, data should be aggregated or destroyed.

6. Individual Access

   - **Access to energy usage data**. Any organization possessing energy data about customers should provide a process to allow customers access to the corresponding energy data for their company's account.

   - **Dispute resolution**. Smart grid entities should establish documented dispute resolution procedures for energy customers to follow.

7. Disclosure and Limiting Use

   - **Limit information use**. Data on energy or other smart grid service activities should be used or disclosed only for the authorized purposes for which it was collected.

   - **Disclosure**. Data should be divulged to or shared only with those parties authorized to receive it and with whom the organizations have told the recipients of services it would be shared.

8. Security and Safeguards

   - **Associate energy data with individuals only when and where required**. For example, only link equipment data with a location or customer account when needed for billing, service restoration, or other operational needs.

   - **De-identify information**. Energy data and any resulting information, such as monthly charges for service, collected as a result of smart grid operations should be aggregated and anonymized by removing personal information elements wherever possible to ensure that energy data from specific customer locations is limited appropriately. This may not be possible for some business activities, such as for billing.

   - **Safeguard personal information**. All organizations collecting, processing, or handling energy data and other personal information from or about customer locations should protect all information collected and subsequently created about the recipients of smart grid services from loss, theft, unauthorized access, disclosure, copying, use, or modification.

   - **Do not use personal information for research purposes**. Any organization collecting energy data and other personal information from or about customer locations should refrain from using actual customer data for research until it has been anonymized and/or sufficiently aggregated to assure to a reasonable degree the inability to link detailed data to individuals.

9. Accuracy and Quality

   - **Keep information accurate and complete**. Any organization collecting energy data from or about customer locations should establish policies and procedures to ensure that the smart grid data collected from and subsequently created about recipients of services is

accurate, complete, and relevant for the identified purposes for which they were obtained, and that it remains accurate throughout the life of the smart grid data within the control of the organization.

10. Openness, Monitoring, and Challenging Compliance

    - **Policy challenge procedures**. Organizations collecting energy data, and all other entities throughout the smart grid, should establish procedures that allow customers to have the opportunity and process to challenge the organization's compliance with their published privacy policies as well as their actual privacy practices.
    - **Perform regular privacy impact assessments (PIA)**. Any organization collecting energy data from or about customer locations should perform periodic PIAs with the appropriate time frames, to be determined by the utility, based upon the associated risks and any recent process changes and/or security incidents.
    - **Establish breach notice practices**. Any organization with smart grid data should establish policies and procedures to identify breaches and misuse of smart grid data, along with expanding or establishing procedures and plans for notifying the affected individuals.

11. Personal Information in the Smart Grid

    - **Determine which data items** will significantly lessen or remove the ability to link to specific addresses or individuals whenever they perform their data anonymization activities.

12. Wireless Access to Smart Meters and Secondary Devices

    - If future wireless technology is used to transmit aggregate home or business energy consumption information for a unique location or dwelling, then **that usage data should also be protected** from unauthorized use, modification, or theft prior to sufficient aggregation to protect privacy.

13. Commissioning, Registration, and Enrollment for Smart Devices

    - **Privacy issues that should be addressed related to the registration of these devices** with third parties include: determining the types of information that are involved with these registration situations; controlling the connections which transmit the data to the third party, such as wireless transmissions from home area networks; and determining how the registration information is used, where it is stored, and with whom it is shared.
    - At each step in this process, the customer, utility, and third party provider should **ensure that data flows have been identified and classified**, and that privacy issues are addressed throughout, from initial commissioning up through service delivery.

14. Smart Grid Data Access by Third Parties - Provides data privacy recommendations for third parties in accessing smart grid data

15. Plug-In Electric Vehicles (PEV) Privacy Concerns

- **Specific solutions or mitigations for PEV** potential privacy issues should be explored as technology solutions are deployed going forward. System and infrastructure architects and engineers should stay aware of potential issues.

16. Awareness and Training

- **Privacy and information security training**. Organizations should support training by ongoing awareness communications, to their workers that have job responsibilities involving customer and energy usage data. Organizations should also consider providing information to their customers and the public to help them to better understand the privacy issues related to the smart grid, along with how the organization is working to mitigate the associated risks, and also steps the public can take to better protect their own privacy.

17. Mitigating Privacy Concerns within the Smart Grid

- **PIAs**. Any organization that collects personal information, or information that can reveal information about personal activities, can identify areas where privacy protections are necessary by performing a PIA. A PIA can be performed internal to the organization, or by an objective outside entity.

- **Audits**. An audit is a structured evaluation of a person, organization, system, process, enterprise, project or product. Among other mitigations, audits can be used to determine compliance levels with legal requirements and to identify areas where policies are not being followed. An audit should ideally be performed by an objective entity that is not a member of the area being audited.

- **Privacy use cases**. Use cases can help smart grid architects and engineers build privacy protections into the smart grid. The Privacy Use Cases in the NISTIR document are focused on data privacy in selected smart grid scenarios, making them unique amongst the many tools, frameworks, and standards that are noted above.

18. Emerging Smart Grid Privacy Risks

- Entities should remain aware of emerging smart grid privacy risks.

10.1.2 Key Observations and Action Items

The NISTIR Guidelines were the primary reference point for performing the assessment. The Guidelines provide 18 categories of suggested best practices for handling energy data for utilities deploying Smart Grid technology (e.g. AMI meters and infrastructure). The Companies' corporate instructions, policies, procedures, and processes were compared for alignment to recommended best practices. Previous audit reports from external third parties were reviewed to understand security controls and processes already in place to support data privacy activities.

In addition to the document review, 20 internal workshops and dozens of interviews were conducted with key stakeholders in both Companies in various departments including IT Cybersecurity, Customer Service Operations, Legal and Compliance and the AMI Infrastructure implementation team. These workshops and interviews provided valuable context and background regarding current and intended data privacy practices.

The assessment categorizes its observations as follows:

1. **Aligns with NIST:** the Companies already use NIST best practices
2. **Not currently aligned:** the Companies have a policy and or procedure in place that requires modification and/or editing to include and address AMI systems and infrastructure
3. **Further review required:** the NIST recommendation requires further review as the suggested practice is complex and requires input from the PSC and or additional investigation
4. **Not Applicable:** the recommendation is not applicable to the Companies' proposed AMI implementation

The details of the assessment are included in Appendix B. An overall summary of the assessment results is shown below in Figure 10-1.

Figure 10-1 AMI Implementation Data Privacy Assessment

No.	NIST Privacy Recommendation	Assessment
1	Management and Accountability	
2	Notice and Purpose	
3	Choice and Consent	
4	Collection and Scope	
5	Use and Retention	
6	Individual Access	
7	Disclosure and Limiting Use	
8	Safety and Safeguards	
9	Accuracy and Quality	
10	Openness, Monitoring, and Challenging Compliance	
11	Personal Information in the Smart Grid	
12	Wireless Access to Smart Meters and Secondary Devices	
13	Commisioning, Registration, and Enrollment for Smart Devices	
14	Smart Grid Data Acess by Third Parties	
15	Plug-in Electric Vehicles Privacy Concerns	
16	Awareness and Training	
17	Mitigating Privacy Concerns within the Smart Grid	
18	Emerging Smart Grid Privacy Risks	

10.1.2.1 Aligned Areas

As shown in Figure 10-1, after review of the Companies' current policies, procedures and practices the assessment concluded that the Companies are currently aligned with eleven of the NIST recommendations and require no further work at this time for these areas. The Companies have

previously implemented policies, procedures, and practices that contain the key elements noted in the following NIST categories:

2. Notice and Purpose

The Companies' Privacy Team Working Group reviews privacy changes and requirements annually and provides updates and notifications through their Privacy Statement. The Companies' Privacy Statements contain adequate information about data collected, use and sharing.

3. Choice and Consent

The Companies provide clear notification about choices made available to them on the Companies' published Privacy Statements (i.e. 'Choice Regarding our Use and Disclosure of your Customer Information to Third Parties'). Additionally, the Privacy Statements provide instances that are excluded from customer choice (i.e. circumstances required by law, regulation or order).

4. Collection and Scope

Companies' Privacy Statements note customer information usage is limited "…for utility operations and services (name, account number, address, email, phone number, energy usage, etc.)…" The Companies are authorized by the PSC to implement AMI and perform necessary data collection which addresses obtaining data by lawful means in the recommendation.

5. Use and Retention

The Companies regularly review and update their policies in this area and the Records Management policy applies to all collected data and records.

6. Individual Access

Customers are able to access energy usage data collected via "My Account" on coned.com and oru.com and will have the ability to download usage information via Green Button Download My Data. In the future, DCX will allow customers to access more data. Today, customers can file complaints/disputes on coned.com under the "Contact Us" link. On oru.com there is a customer contact number and on-line form available to file a dispute.

7. Disclosure and Limiting Use

The Companies' Privacy Statement limits the purposes for which data collection is authorized, for example billing, customer service, data analysis, fraud monitoring, etc. Additionally, the Privacy Statement provides customers a list of authorized parties that customer energy data may be shared with.

8. Security and Safeguards

The Companies' AMI Business Process Designs detail the data structures and utilization of energy usage data collected for AMI. Energy data is only linked with individuals when required to conduct business operations. The Companies have policies detailing the handling of PII and energy data, including instructions on the protection of all restricted, sensitive and critical data. The Companies have policies that address de-identifying and

anonymizing personal information from energy usage data. Additionally, the Companies do not share customer information including energy data or other personal information for research purposes.

9. Accuracy and Quality

The Companies' Validation, Estimation, and Editing (VEE) of the meter data management (MDM) system is the process that continually keeps smart grid data accurate and complete.

11. Personal Information in the Smart Grid

This NIST recommendation addresses anonymization practices similar to recommendation 8 - Security and Safeguards. The Companies' Customer Service Procedures list data items that should be de-identified or anonymized to mitigate linking individuals or addresses to energy usage data.

16. Awareness and Training

The Companies have information security training and awareness programs in place for employees including the "CyberAware Program," Customer Operations PII training, and the Information Security Policy.

18. Emerging Smart Grid Privacy Risks

The Companies have an enterprise Risk Management program designed to identify, assess, mitigate, and monitor material risks across the company including data privacy risks that might emerge from the AMI program.

10.1.2.2 Non-applicable Areas

Three of the recommendations focus on areas that are not currently part of the Companies' AMI implementation plan:

12. Wireless Access to Smart Meters and Secondary Devices

13. Commissioning, Registration, and Enrollment for Smart Devices

15. Plug-in Electric Vehicles Privacy Concerns

10.1.2.3 Areas Subject to Further Review

One area that requires further review by the Companies in collaboration with the NYPSC and stakeholders:

14. Smart Grid Data Access by Third Parties

Energy usage data is becoming more pervasive as the electric grid becomes more intelligent. This data can potentially be sensitive, privacy-impacting data in need of protection. This is particularly true when customer energy usage data (CEUD) is combined with other data, such as an account number or smart meter IP address that then makes it identifiable to one premise or customer. The recommended privacy practices suggest how CEUD, and the data combined with it are best secured to protect

personal privacy. The recommendations also help educate consumers on what they should expect out of third parties with which they choose to share their data.

The PSC in the DER Oversight Proceeding will provide guidance on addressing third-party data privacy obligations and requirements. Once available, the Companies will utilize this guidance in future agreements with third parties in order to address data privacy obligations and requirements as outlined in the NIST Guidelines.

10.1.2.4 Non-aligned Areas

The Companies have existing practices in three areas where additional information specific to AMI data would help align these practices with the NIST recommendations once AMI has been implemented.

1. Management and Accountability

The Companies have a Privacy Team Working Group that meets regularly to address data privacy issues. The Companies' current Incident Response plan provides procedures and processes to address incidents including AMI systems. Since the Companies have not implemented AMI, existing audit procedures do not include auditing of key energy data access points (e.g., MDMS, Green Button, DCX). These access points are entry points for internal users, customers and third parties to stored customer data. Once AMI is operational these points should be monitored for unauthorized access. Prior to AMI implementation, the Companies will update privacy audit procedures to include auditing of key energy data access points.

10. Openness, Monitoring, and Challenging Compliance

The Companies have established and published procedures that allow customers to have the opportunity and process to challenge compliance with published privacy policies and privacy practices. Customers currently can file complaints and disputes on coned.com and oru.com under the "Contact Us" link. The Companies also have documented procedures and policies detailing breach identification, response, and notification that include AMI systems as part of business critical systems. The Companies conduct regular data assessments but do not formally conduct PIAs as it relates to AMI data. The Companies will begin conducting PIA's on implemented AMI systems as part of regular audit plans.

17. Mitigating Privacy Concerns within the Smart Grid

The Companies conduct multiple cybersecurity audits annually through internal and external third parties. As noted in recommendation 10, the Companies will begin conducting PIA's on implemented AMI systems as part of regular audit plans.

10.2 Data Access Principles

In addition to the data privacy assessment, the Commission also required the Companies to investigate "formal data access and privacy policies, called Fair Information Practice Principles." The Companies were directed to propose data privacy and access principles relating to implementation of AMI for Commission review. This section summarizes the proposed principles.

As the Commission noted there are many examples of data privacy frameworks and Fair Information Practice Principles (FIPP) used, including the U.S. Federal Trade (FTC) Privacy Framework; the Department of Homeland Security (DHS) Fair Information Practice Principles; and the Organization for Economic Co-operation and Development (OECD) Privacy Principles.

When considering which set of FIPPs to use for creating privacy use cases, this group decided to use the OECD Privacy Guidelines. According to NIST these guidelines are: long-established and widely recognized; freely available; and straightforward concepts that will be more easily and consistently utilized when building privacy controls into processes.[108] For this purpose, the Companies adopted the OECD Privacy Guidelines.

The Companies also benchmarked other utilities and their use of various FIPP principles. The results are shown in Figure 10-2 below. Utilities similar in size with established and mature AMI implementations were selected as benchmarks. These well-documented programs represent geographic, regulatory, and demographic balance across the U.S.

Figure 10-2 FIP Principles Benchmarking

	OECD	FTC	DHS	Combined
ComEd	X			
PG&E	X		X	X
SCE	X		X	X
FP&L (NextEra)	X			

10.2.1 Data Access Principles Approach

The OECD Principles include eight key areas of recommended focus that guide the Companies' proposals for the AMI program

1. **Collection Limitation Principle:** There should be limits to the collection of personal data and any such data should be obtained by lawful and fair means and, where appropriate, with the knowledge or consent of the data subject.
2. **Data Quality Principle:** Personal data should be relevant to the purposes for which they are to be used and, to the extent necessary for those purposes, should be accurate, complete and kept up-to-date.
3. **Purpose Specification Principle:** The purposes for which personal data are collected should be specified not later than at the time of data collection and the subsequent use limited to the

[108] Ibid, Volume 2, pg 49

fulfilment of those purposes or such others as are not incompatible with those purposes and as are specified on each occasion of change of purpose.

4. **Use Limitation Principle:** Personal data should not be disclosed, made available or otherwise used for purposes other than those specified.
5. **Security Safeguards Principle:** Personal data should be protected by reasonable security safeguards against such risks as loss or unauthorized access, destruction, use, modification or disclosure of data.
6. **Openness Principle:** There should be a general policy of openness about developments, practices and policies with respect to personal data. Means should be readily available of establishing the existence and nature of personal data, and the main purposes of their use, as well as the identity and usual residence of the data controller.
7. **Individual Participation Principle:** An individual should have the right to:
    - Obtain from a data controller, or otherwise, confirmation of whether or not the data controller has data relating to the individual;
    - Have communicated to the individual, data relating to the individual
        - Within a reasonable time
        - At a charge, if any, that is not excessive
        - In a reasonable manner
        - In a form that is readily intelligible to the individual
    - Be given reasons if a request made under subparagraphs (a) and (b) is denied, and to be able to challenge such denial; and
    - Challenge data relating to the individual and, if the challenge is successful to have the data erased, rectified, completed or amended.
8. **Accountability Principle**: A data controller should be accountable for complying with measures which give effect to the principles stated above.

10.2.2 Conclusions

Each of these principles contains detailed considerations that were examined from a utility-specific perspective (and consider the prevalence of AMI energy usage data once meters are deployed). The elements were compared to the Companies' existing Privacy Statement to consider any changes required to the policy.

Six of the principles are already included in the Companies' current Privacy Statement. The data quality principle (#2) may require additional language that addresses accuracy, completeness, and timeliness of data collected. The individual participation principle (#7) may require additional language to specify customer rights or access to their data.

Finally, each principle was benchmarked against other Companies and their privacy policies to develop similar options for the Companies. These activities resulted in a set of proposed FIPP principles for the

Companies based on the OECD framework. The following principles and the corresponding language that supports each principle are proposed as the Companies' response to the AMI Order.

10.2.3 The Companies' Proposed Data Access Principles as it relates to Energy usage data

1. **Collection Limitation Principle:** By accepting a smart meter the customer grants the Companies consent to collect AMI smart meter data. The Companies collect AMI smart meter data for the purposes of servicing our customers' accounts. The smart meter does not store or transmit PII or customer identifying information nor does it record how electricity is used or what appliances/devices customers may use.
2. **Data Quality Principle:** The Companies only collect as much customer information as is reasonably required to provide utility services to you or as approved by regulatory agencies or required by law. Disposal of customer data is performed in accordance with our record retention and disposal policies.
3. **Purpose Specification Principle:** The Companies will use AMI smart meter collected data information to administer your account, inform you about your energy usage and utility programs and services available to you, and provide quality service. These services include generating the customer billing statement and allowing customers to see and track energy usage data using web based applications to improve the overall customer experience. Changes and updates to data collection and use are provided on our online Privacy Statement.
4. **Use Limitation Principle:** The Companies are committed to safeguarding the security and confidentiality of AMI collected customer information and will only disclose and/or share that data as stated in our privacy statement. We support and comply with state laws and any regulatory orders that bar third-party access to individual customer data unless it is necessary for the legitimate business needs of the utility, the customer explicitly requests or approves sharing of their data with designated third parties, or it is required by law.
5. **Security Safeguards Principle:** The Companies will endeavor to provide appropriate measures and security technologies to safeguard customer information and allow only authorized entities access to customer information collected via AMI smart meters. Additional details regarding the safeguards used for customer information can be found in our Privacy Statement.
6. **Openness Principle:** The Companies will make every reasonable effort to inform customers of any changes to data access and data privacy practices or policies associated with collected AMI smart meter data.
7. **Individual Participation Principle:** The Companies shall provide to customers via web based applications secure access to their covered information and the following:
    a. Acknowledgment that the Companies are in custody of customer data collected via AMI smart meters data will be presented in an easily understood format and terminology
    b. A dispute and resolution process for issues relating to customer's data and access
8. **Accountability Principle:** The Companies will make every reasonable effort to comply with these Principles. However, there are legal and business exceptions to these policies: (a) compliance with applicable legal process or orders from our governing regulatory agencies including, among others, the New York State Public Service Commission; (b) response to requests from

government or legal authorities; (c) enforcement of our terms and conditions of service; (d) protection of our operations; (e) protection of our rights, privacy, safety or property; and (f) allowing us to pursue available remedies or limit the damages that we may sustain. We also may use customer information to send you marketing communications, offers and promotions that may be of interest to you.

11 Conclusion

This Plan provides a framework to communicate and collaborate with customers and interested third parties in support of the Companies' AMI and DCX initiatives. While AMI and DCX provide technologies that support customer control, choice and convenience, the Plan will help customers and third parties better understand how to best take advantage of these technologies. The Companies' Plan promotes customers and third parties' participation in a distributed energy system, as defined in the REV initiative.

The Companies combined research, past experience, benchmarking, and outreach to develop the Plan. The Companies' collaborative relationship with customers, energy service companies, and other interested parties played an invaluable role in gaining extensive support for the effort. Energy data access, rate pilots, and additional AMI-enabled opportunities detailed in the Plan support security and convenience for customers and third parties. The Companies will continuously seek and benefit from feedback from interested parties to maintain a customer-centric focus as new AMI-enabled opportunities arise beyond their AMI and DCX rollouts.

In summary, the Companies believe the Plan complies with the directives in the AMI Order and provides a robust framework for successful customer third-party engagement as part of AMI deployment.

12 Appendix A. Customer Engagement Collaborative[109]

- Association for Energy Affordability
- Bright Power
- Center for Community Development
- City of New York
- County of Westchester
- Direct Energy Services
- Environmental Defense Fund
- EnerNOC
- FS Energy
- Local 1-2
- Luthin Associates
- Metropolitan Transportation Authority
- Mission:data
- New York Energy Consumers Council
- New York Power Authority
- New York Public Service Commission
- NY State Department of Public Service
- New York Department of State
- NRG Energy
- NYSERDA
- PACE
- Public Utility Law Project of New York
- Quadlogic
- Sapient Global Markets
- Siemens
- SolarCity

[109] Organizations who were invited to but did not participate in any collaboration: Adaptive Energy Strategies, Constellation, County of Rockland, Forum for Climate Engineering Assessment, GDF Suez Energy Resources NA, Green Mountain Energy, IBEW Local Union 503, ICF International, IGS Energy, Just Energy New York Corp., Natural Resources Defense Council, NY Battery & Energy Storage Tech. Consortium, NY City Dept. of Environmental Protection, New York Independent System Operator, NYC Mayor's Office of Sustainability, PPMS, Related Companies, Retail Energy Supply Association, Sabin Center for Climate Change Law, Town of Ramapo, UIU, Division of Consumer Protection

13 Appendix B. Data Privacy Assessment Summary

AMI Data Privacy Assessment Summary

Evaluation Assignment Criteria

Aligned	Companies' existing policies & procedures reflect NIST data privacy recommendations
Not Aligned	Companies' existing policies & procedures do not reflect NIST data privacy recommendations
Further Review Required	Further review is required in order to provide an assessment of companies' exiting policies & procedures with NIST data privacy recommendations
Not Applicable	NIST data privacy recommendations are not applicable to companies' current AMI implementation design

conEdison Orange & Rockland westMONROE

AMI Data Privacy Assessment

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Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
1. Management & Accountability					
1.1 Assign Privacy Responsibility	Each organization collecting or using smart grid data from or about consumer locations should create (or augment) a position or person with responsibility to ensure that privacy policies and practices exist and are followed	Privacy & Data Protection Working Group Team Charter		Companies have a 'Privacy Team Working Group' charged with the responsibility of ensuring existing privacy policies and procedures are followed	Consider assigning a head position to this privacy working group in current charter
1.2 Establish Privacy Audits	Audit functions should be modified to monitor all privacy-related energy data access	Privacy Audit Procedure - CEI 200		Companies' current privacy audit procedures do not adequately address energy data access privacy vulnerabilities	Update Companies' Privacy Audit Procedures to include auditing of key energy data access points (e.g. MDMS, CIS, DCX, Green Button, etc.) prior to implementing AMI
1.3 Establish or amend incident response and law enforcement request policies and procedures	Organizations accessing, storing, or processing energy data should include specific documented incident response procedures for incidents involving energy data	Incident Response Procedures		Incident Response Procedures direct incident reporter to designated Incident Commanders, who inform the appropriate system administrator for resolution; procedure contains links to critical business systems include those involving energy data	None
2. Notice and Purpose					
2.1 Provide notification for the personal information collected	Any organization collecting energy data from or about consumers should establish a process to notify consumer account inhabitants and person(s) paying the bills (which may be different entities), when appropriate, in a clearly worded description of the data being collected, why it is necessary to collect the data, and the intended use, retention, and sharing of the data	Published Privacy Statement on coned.com and oru.com		Companies Privacy Statement provides information about data collected, use and sharing; Privacy Statements note that data collected includes, name, account number, address, etc.,; intended uses indicated are data analysis, audits, fraud monitoring and prevention, etc.; and sharing of data may occur with service parties, contractors, affiliates, etc.	None
2.2 Provide notification for new information use purposes and collection	Organizations should update consumer notifications whenever they want to start using existing collected data for materially different purposes other than those the consumer has previously authorized.	Published Privacy Statement on coned.com and oru.com		Companies' Privacy Team Working Group reviews privacy changes and requirements annually and provides updates and notifications via their Privacy Policy Statement	None
3. Choice and Consent					
3.1 Provide notification about choices	The consumer notification should include a clearly worded description to the recipients of services notifying them of (1) any choices available to them about information being collected and obtaining explicit consent when possible; and (2) explaining when and why data items are or may be collected and used without obtaining consent, such as when certain pieces of information are needed to restore service in a timely fashion	Published Privacy Statement on coned.com and oru.com		Companies provide clear notification about choices made available to them on the Companies' published Privacy Statements (i.e. 'Choice Regarding our Use and Disclosure of your Customer Information to Third Parties'); also provides instances that are excluded from customer choice (i.e. circumstances required by law, regulation or order)	None

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Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
4. Collection and Scope					
4.1 Limit the collection of data to only that necessary for smart grid operations	[… I]including planning and management, improving energy use and efficiency, account management, and billing	Published Privacy Statement on coned.com and oru.com.		The list of customer data collected that is reflected in Companies' Privacy Statements is limited for utility operations and services (name, account number, address, email, phone number, energy usage, etc.)	None
4.2 Obtain the data by lawful and fair means and, where appropriate and possible, with the knowledge or consent of the customer		Published Privacy Statement on coned.com and oru.com; smart meter opt-out		Companies are authorized by the PSC to implement AMI and perform necessary data collection; Companies also noted that all customers will receive AMI education and awareness communication, and will have the ability to opt-out of AMI	None
5. Use and Retention					
5.1 Review privacy policies and procedures	Every organization with access to smart grid data should review existing information security and privacy policies to determine how they may need to be modified	Data Privacy Assessment; Privacy Team Working Group		Companies' data privacy and security policies and procedures were reviewed for the purposes of this Data Privacy Assessment in order to identify required modifications to existing policies and procedures in order to accommodate smart grid data following the Companies' AMI implementation; any future required modifications will be reviewed by Data Privacy Working Group on a ongoing basis	None
5.2 Limit information Retention	Data, and subsequently created information that reveals personal information or activities from and about a specific consumer location, should be retained only for as long as necessary to fulfill the purposes that have been communicated to the energy consumers. After the appropriate retention period, data should be aggregated or destroyed	870-1 Records Management; Data Minimization Guidelines		Companies 870-1 Records Management policy applies to all company collected data and records in accordance with PSC requirements for maintaining data; retention and destruction parameters are referenced in Section 3.4 of the policy and specific record classes are identified in the Records Management Hotsite; Document CUS 1120 (Customer Record Class) defines data types and retention periods for customer information; these policies follow the NIST recommendation guidelines for Limiting Information Retention	None
6. Individual Access					
6.1 Access to energy usage data	Any organization possessing energy data about consumers should provide a process to allow consumers access to the corresponding energy data for their utilities account	Company websites (My Account and Green Button Download My Data®)		Today customers access usage data via "My Account" on coned.com and oru.com and view usage information as well as download usage information through Green Button Download My Data; following the Companies' AMI implementation customers will continue to access to their interval energy usage through similar tools that will be enhanced through the DCX platform	None

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Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
6.2 Dispute Resolution	Smart grid entities should establish documented dispute resolution procedures for energy consumers to follow	Published Privacy Statement on coned.com and oru.com	✓	Companies provide energy consumers dispute resolution procedures in their respective Privacy Statements under 'Corrections to Your Customer Information' where customers are directed to a "Contacting Us" link in order to communicate their energy disputes	None
7. Disclosure and Limiting Use			✓		
7.1 Limit information use	Data on energy or other smart grid service activities should be used or disclosed only for the authorized purposes for which it was collected	Published Privacy Statement on coned.com and oru.com	✓	The list of customer data uses that is reflected in both Companies' Privacy Statement is sufficiently limited to those purposes for which collection was authorized (i.e. billing, customer service, data analysis, fraud monitoring and protection, etc.)	None
7.2 Disclosure	Data should be divulged to or shared only with those parties authorized to receive it and with whom the organizations have told the recipients of services it would be shared	Published Privacy Statement on coned.com and oru.com	✓	Companies' provide customers a list of authorized types of parties (service providers, contractors, affiliates, governmental authorities, etc.) in their respective Privacy Statements	None
8. Security and Safeguards			✓		
8.1 Associate energy data with individuals only when and where required	For example, only link equipment data with a location or consumer account when needed for billing, service restoration, or other operational needs	Consolidated Edison, Orange and Rockland MDMS Data Synchronization .01.21.2016; Reference Data Capability Map; ConEd_DataProfiles_20 16.06.16	✓	Supporting documentation for Companies' current AMI implementation details the data structures, utilization, security, and the de-identification of energy data	None
8.2 De-identify information	Energy data and any resulting information, such as monthly charges for service, collected as a result of smart grid operations should be aggregated and anonymized by removing personal information elements wherever possible to ensure that energy data from specific consumer locations is limited appropriately. This may not be possible for some business activities, such as for billing	Customer Service Procedure CSP 2-0-25	✓	The Companies' CSP 2-0-25 procedure lists data items(name, account number, address, etc.) that should be de-identified and anonymized to limit the ability to energy data to individuals or addresses.	None
8.3 Safeguard personal information	All organizations collecting, processing, or handling energy data and other personal information from or about consumer locations should ensure that all information collected and subsequently created about the recipients of smart grid services is appropriately protected in all forms from loss, theft, unauthorized access, disclosure, copying, use, or modification	Computer data security and Protection of Personally Identifiable Information (PII) policies (specific names of these policies and procedures have been redacted)	✓	Companies' have procedures that provide instructions on the protection of PII, and provides guidance on protecting all restricted, sensitive and critical data; specific names of these policies and procedures have been redacted	None

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Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
8.4 Do not use personal information for research purposes	Any organization collecting energy data and other personal information from or about consumer locations should refrain from using actual consumer data for research until it has been anonymized and/or sufficiently aggregated to assure to a reasonable degree the inability to link detailed data to individuals			Companies do not share customer information, including energy data and other personal information, for research purposes; in instances where the Companies do share energy usage data for research purposes, it is sufficiently aggregated and anonymized to ensure individual customers are not identified (e.g., Local Law 84 and municipal benchmarking)	
9. Accuracy and Quality					
9.1 Keep information accurate and complete	Any organization collecting energy data from or about consumer locations should establish policies and procedures to ensure that the smart grid data collected from and subsequently created about recipients of services is accurate, complete, and relevant for the identified purposes for which they were obtained, and that it remains accurate throughout the life of the smart grid data within the control of the organization	CECONY and ORU - Project Functional Specification Version 1.0; MB.500 Validation Estimation and Editing; Notes - MB.500 - CECONY - Estimation		Companies' Validation, Estimation, and Editing (VEE) process noted in the AMI design document CECONY and ORU - Project Functional Specification Version 1.0, is the system responsible for maintaining and validating data accuracy programmatically by applying; flag, validate/flag, and validate/edit rules to data flows	None
10. Openness, Monitoring, and Challenging Compliance					
10.1 Policy challenge procedures	Organizations collecting energy data, and all other entities throughout the smart grid, should establish procedures that allow consumers to have the opportunity and process to challenge the organization's compliance with their published privacy policies as well as their actual privacy practices	Published Privacy Statement on coned.com and oru.com		Companies' Privacy Statements provide the opportunity and process for customers to challenge the companies' compliance with established privacy policies and practices through 'Contact Us' link or by mail at address provided	None
10.2 Perform regular privacy impact assessments	Any organization collecting energy data from or about consumer locations should perform periodic PIAs with the appropriate time frames, to be determined by the utility and the appropriate regulator, based upon the associated risks and any recent process changes and/or security incidents			Companies do not perform formal PIAs	Companies should conduct formal PIA's on AMI systems prior to implementation and on a periodic basis (annually); companies should also perform formal PIAs when material changes have been performed to existing AMI systems
10.3 Establish breach notice practices	Any organization with smart grid data should establish policies and procedures to identify breaches and misuse of smart grid data, along with expanding or establishing procedures and plans for notifying the affected individuals in a timely manner with appropriate details about the breach	Data Breach Response Process, Cybersecurity Program Manual		Companies have documented procedures and policies detailing breach identification, response, and if needed notification of affected customers to include smart grid data (which authorities to contact, contacting customers, triggers privacy team impact assessment, incident command structure, etc.)	None

AMI Data Privacy Assessment

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Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
11. Personal Information in the Smart Grid					
11.1 Personal Information in the Smart Grid	All organizations participating in the smart grid should determine which data items will significantly lessen or remove the ability to link to specific addresses or individuals whenever they perform their data anonymization activities	Customer Service Procedure CSP 2-0-25		The Companies' CSP 2-0-25 procedure lists data items(name, account number, address, etc.) that should be de-identified and anonymized to limit the ability to link energy data to individuals or addresses	None
12. Wireless Access to Smart Meters and Secondary Devices					
12.1 Wireless Access to Smart Meters and Secondary Devices	If future wireless technology is used to transmit aggregate home or business energy consumption information for a unique location or dwelling, then that usage data should also be protected from unauthorized use, modification, or theft prior to sufficient aggregation to protect privacy			While meters are currently capable of communicating through existing communication protocols (e.g., HAN), the Companies have not developed plans to allow wireless transmission of energy data from a customer to secondary devices; however, companies remain mindful of these privacy vulnerabilities (unauthorized use, theft, etc.) as they explore secondary devices and other enabling technologies	Should Companies consider future programs with secondary devices they will want to consider privacy vulnerabilities associated with secondary device energy data transmission (e.g., unauthorized use, modification and theft) when exploring secondary devices and other enabling technologies
13. Commissioning, Registration, and Enrollment for Smart Devices					
13.1 Commissioning, Registration, and Enrollment for Smart Devices	Privacy issues that should be addressed related to the registration of these devices with Third Parties include: determining the types of information that are involved with these registration situations; controlling the connections which transmit the data to the Third Party, such as wireless transmissions from home area networks; and determining how the registration information is used, where it is stored, and with whom it is shared			While meters are currently capable of communicating through existing communication protocols (e.g., HAN), the Companies have not developed plans to allow wireless transmission of energy data from a customer' smart devices; however, companies remain mindful of these privacy vulnerabilities (controlling connection, types of information shared, etc.) as they explore smart devices and other enabling technologies	Should Companies consider future programs with smart devices they should also consider privacy vulnerabilities associated with smart device energy data transmission (e.g., unauthorized use, modification and theft) when exploring smart devices and other enabling technologies
13.2 Commissioning, Registration, and Enrollment for Smart Devices	At each step in this process, the consumer, utility, and Third-Party provider should ensure that data flows have been identified and classified, and that privacy issues are addressed throughout, from initial commissioning up through service-provider-delivered service			While meters are currently capable of communicating through existing communication protocols (e.g., HAN), the Companies have not developed plans to allow wireless transmission of energy data from a customer's smart devices; however, companies remain mindful of these privacy vulnerabilities (classified data flow) as they explore smart devices and other enabling technologies	Should Companies consider future programs with smart devices they should also consider privacy vulnerabilities associated with smart device energy data transmission (e.g., unauthorized use, modification and theft) when exploring smart devices and other enabling technologies

AMI Data Privacy Assessment

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Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
14. Smart Grid Data Access by Third Parties					
14.1 Privacy Notices	Third Parties should provide a privacy notice to customers prior to sharing customer energy usage data (CEUD) with another party, or in the case of a significant change in organizational structure, such as a merger, bankruptcy, or outsourcing			The PSC in the DER Oversight Proceeding will provide guidance on addressing third-party data privacy obligations and requirements. Once available, the Companies will utilize this guidance in future agreements with third parties in order to address data privacy obligations and requirements as outlined in the NIST Guidelines (i.e., privacy notices, customer authorization for disclosures, data disclosure, customer education and awareness, data minimization, data quality, data security, privacy practices risk assessment, data retention and disposal, data breaches, employee training, and audits).	Companies should review additional guidance and direction from the PSC with regard to Third-Party data privacy obligations when available; consider any necessary modifications to existing privacy policies and procedures
14.2 Customer Authorization for Disclosures	Third Parties should seek customer authorization prior to disclosing CEUD to other parties unless the service for which the data disclosure is necessary has been previously authorized by the customer			Same as 14.1	Same as 14.1
14.3 Data Disclosure	A Third Party should not be collecting more than what is required to fulfill the agreed upon service, and a separate authorization should be obtained before CEUD is used in a different manner			Same as 14.1	Same as 14.1
14.4 Customer Education & Awareness	Third Parties should educate customers about the Third Party's CEUD privacy protection policies and practices, including the steps the Third Party is taking to protect privacy			Same as 14.1	Same as 14.1
14.5 Data Minimization	In following with the FIPPs, Third Parties should collect only the CEUD they need to provide the service they offer and have an authorization for			Same as 14.1	Same as 14.1
14.6 Data Quality	Data should be as accurate and complete as possible			Same as 14.1	Same as 14.1

AMI Data Privacy Assessment

Provided here for ease of presentation is a listing of the NIST recommendation, description, list of key documents reviewed as part of the assessment, and a summary of the AMI Data Privacy assessment findings included with this filing

Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
14.7 Data Security	Third Parties should have clear data security policies that should be periodically reviewed and updated			Same as 14.1	Same as 14.1
14.8 Privacy Practices Risk Assessment	Periodic assessments of the privacy practices should be performed			Same as 14.1	Same as 14.1
14.9 Data Retention and Disposal	Third Parties should have clear policies on how long data will be retained, as well as when and how CEUD will be disposed of			Same as 14.1	Same as 14.1
14.10 Data Breaches	Third Parties should be aware of any laws or requirements with regard to data breaches. These rules may apply, not just to the Third Party, but also to their Contracted Agents			Same as 14.1	Same as 14.1
14.11 Employee Training	Employees of Third Parties and their Contracted Agents should be trained on the security and privacy practices necessary to protect customer CEUD			Same as 14.1	Same as 14.1
14.12 Audits	The recommended practices discuss the use of independent Third-Party audits of security and privacy practices. These audits may be useful in helping to identify issues before they become legitimate problems			Same as 14.1	Same as 14.1
15. Plug-in Electric Vehicles Privacy Concerns					
15.1 Plug-in Electric Vehicles Privacy Concerns	Specific solutions or mitigations for PEV potential privacy issues should be explored as technology solutions are deployed going forward. System and infrastructure architects and engineers should stay aware of potential issues			Companies understand and are aware of potential privacy issues associated with plug-in electric vehicles (e.g., vehicle purchase, data usage collection, location, etc.) Note: PEVs are currently not part of the Companies' AMI implementation per Companies' AMI Business Plan	None

AMI Data Privacy Assessment

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Aligned *Not Aligned* *Further Review Required* *Not Applicable*

NIST Privacy Recommendation	Description	Applicable Privacy Document(s)	Assessment	Assessment Comments	Recommended Action
16. Awareness and Training					
16.1 Awareness and Training	Organizations involved within the smart grid should provide privacy and information security training, supported by ongoing awareness communications, to their workers that have job responsibilities involving customer and energy usage data. Organizations should also consider providing information to their customers and the public to help them to better understand the privacy issues related to the smart grid, along with how the organization is working to mitigate the associated risks, and also steps the public can take to better protect their own privacy	CyberAware Program; Customer Operations PII training; Information Security Policy		Companies have information security training and awareness programs in place for employees: - CyberAware program, which provides on-line training to employees - Routine company-wide email blasts provide updates and notifications to users about cybersecurity issues, warnings, and training - Business departments also conduct information security training specific to their work functions and tasks (for example Customer Service Operations conduct training on handling and securing PII)	None
17. Mitigating Privacy Concerns within the Smart Grid					
17.1 Perform privacy impact assessments (PIAs)	Any organization that collects personal information, or information that can reveal information about personal activities, can identify areas where privacy protections are necessary by performing a PIA. A PIA can be performed internal to the organization, or by an objective outside entity.			Companies do not perform formal PIAs	Companies should conduct formal PIA's on AMI systems prior to implementation and on a periodic basis (annually); companies should also perform PIAs when material changes have been performed to existing AMI systems
17.2 Perform Audits	An audit is a structured evaluation of a person, organization, system, process, enterprise, project or product. Audits can be used to determine compliance levels with legal requirements, to identify areas where policies are not being followed, and so on. An audit should ideally be performed by an objective entity that is not a member of the area being audited	Internal Audit Documents; KPMG PII Cybersecurity Audit; KPMG Governance Audit		Companies conduct multiple cybersecurity and PII audits annually; audits are performed by internal auditors as well as by third parties; confirmed that previous third-party audits were conducted on a regular basis	None
17.3 Utilize the Privacy Use Cases	Use cases can help smart grid architects and engineers build privacy protections into the smart grid. The Privacy Use Cases in this document are focused on data privacy in selected smart grid scenarios, making them unique amongst the many tools, frameworks, and standards that are noted above			NIST Guidelines provide (44) use cases for utilities to aid in developing privacy protections; while Companies did not utilize NIST use cases, they intend to use them as they implement AMI	Recommend Companies consider applicable NIST 'Use Cases' in evaluating and validating privacy policies and procedures prior to implementing AMI in their respective territories
18. Emerging Smart Grid Privacy Risks					
18.1 Emerging Smart Grid Privacy Risks	Entities should remain aware of emerging smart grid privacy risks	CEI-203 CI Enterprise Risk Management Program		The Enterprise Risk Management (ERM) program is designed to identify, assess, mitigate, and monitor material risks across the company. Upon implementing AMI, the Companies indicated that AMI areas will be included in the ERM program	None