Enver Acevedo
Associate Counsel
Law Department
Consolidated Edison Company of New York, Inc.
4 Irving Place, Room 1815-S, New York NY 10003
Tel.: 212-460-3762 Fax: 212-677-5850
Email: acevedoe@coned.com

June 29, 2018

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

Re: Case 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision – Demonstration Projects

Dear Secretary Burgess:

I attach for filing with the Public Service Commission, Orange and Rockland Utilities, Inc.'s Implementation Plan for the Innovative Storage Business Model REV Demonstration Project.

Please contact me if you have any questions regarding this matter.

Very truly yours,

/s/ *Enver Acevedo*

Attachments

Orange & Rockland

REV Demonstration Project Implementation Plan

Orange and Rockland Utilities, Inc.

Innovative Storage Business Model

29 June 2018

Orange & Rockland

Table of Contents

1 Executive Summary

Energy storage is a key distributed energy resource ("DER") with the potential to support the goals of the Public Service Commission's ("Commission") Reforming the Energy Vision ("REV") initiative[1] through its ability to improve the overall efficiency of the bulk power system, while also providing benefits to customers and the utility's distribution system. Governor Cuomo has expressed his support for energy storage with an overall vision of deploying 1500MW of energy storage throughout the state of New York by 2025.

Orange and Rockland Utilities, Inc. ("O&R" or the "Company") will collaborate with Tesla on an Innovative Storage Business Model Demonstration Project (the "Project") to exhibit an energy storage model that has the potential to realize the unique attributes of energy storage and enable its wide-scale deployment. The Project will test the hypothesis that batteries can provide a range of services across multiple value streams by maximizing storage utilization, and will develop a business model that allows for the sharing of costs and benefits across multiple stakeholders (e.g., grid benefits for utilities and reduced demand charges for customers). Furthermore, the Project will develop and test methods to mitigate storage implementation barriers, in order to support the acceleration of wide-spread storage deployment in New York.

The Project will consist of a 4MW/8MWh portfolio of aggregated batteries. Individual battery sites will be located both behind-the-meter ("BTM") of commercial and industrial ("C&I") customers and co-located with front-of-the-meter ("FTM") distribution-connected remote solar projects in O&R's service territory. All battery installations will be developed, designed, installed, operated, and maintained by Tesla.

O&R will retain the primary dispatch rights and operational priority of the entire portfolio of aggregated batteries through a contract with Tesla for energy storage grid services. In addition to providing transmission and distribution ("T&D") benefits, batteries deployed BTM at C&I customer sites will reduce the host's demand charges. Tesla will work with O&R to develop innovative, multi-use operational strategies to balance dispatch among various stakeholder groups. These strategies will be guided by algorithms and protocols designed to deliver optimal dispatch for the aggregated portfolio, maximizing the portfolio value among customers, the distribution grid, and third-party vendor. Under this business model, the flexible operating characteristics of distributed energy storage will be employed to obtain the highest value use of the resource at any point in time.

2 Demonstration Design

The Project seeks to demonstrate that energy storage can provide increased value to a variety of stakeholders by participating in multiple value streams. Through a multi-use model, a single energy storage asset can provide value to customers, the utility, and developers. As described in the following sections, this model will increase the asset utilization to take full advantage of the asset's potential and improve economics to expand market size.

Maximizing the value of customer-sited BTM batteries and FTM remote solar plus storage resources through multiple value streams may result in a larger market opportunity for energy storage. If it is proven that BTM and remote solar plus storage systems can be reliably dispatched to provide multiple services (e.g., distribution deferral, demand charge management, and wholesale revenues), then more energy storage has greater potential for deployment by third-parties due to the increased revenue potential. As a result of optimal storage dispatch and aggregated distributed assets, upfront costs may be reduced and utility investors may benefit based on the ability of the Distribution System

[1] Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV Proceeding").

Provider ("DSP") to monetize savings from avoided or deferred infrastructure upgrades. Finally, operational data and lessons learned from this project may be used to inform the development of wholesale market rules which extract greater value from energy storage, and distributed energy resources, more broadly.

Due to the dynamic energy environment and policy advances anticipated over the demonstration period, the project team expects to make operational adjustments to optimize the value of the aggregation. Advances and corresponding adjustments will be highlighted and reported to the Commission during the quarterly reporting process, as discussed in Section 5 of this Project Implementation Plan.

2.1 Test Population

The Project will test two similar, but distinct, battery deployments:

1) a 2MW/4MWh BTM portfolio sited at C&I host customer locations; and
2) a 2MW/4MWh FTM portfolio co-located with remote solar site(s).

Both deployments seek to demonstrate that the allocation of costs and benefits of energy storage to multiple stakeholders will reduce the barriers that are currently associated with energy storage. The Project seeks to demonstrate a viable business model in which all parties may receive net benefits. Additional detail on each deployment is provided below. Tesla will own the assets and the costs of the total installation will be shared across the utility, host customers and Tesla.

2.1.1 BTM C&I Customers

The BTM portfolio will consist of approximately 2 through 8 sites. Each site is anticipated to consist of a 250 kW through 500 kW battery system with 2 to 4 hours of discharge capacity. This segment of the Project seeks to demonstrate BTM deployments can provide demand charge reduction to the host customers, grid services to O&R, and ancillary services to the New York Independent System Operator ("NYISO") wholesale market. Host customers may be able to achieve demand charge savings at a lower system cost than would be available if the battery were used only in a single-use application. O&R will partner with Tesla to identify and select C&I customers who are able to host a storage installation for this demonstration and have the following attributes:

- The customer pays high demand charges which are driven by a load profile with periods of concentrated high load (relatively low load factor); and
- The customer is located on a circuit where load reduction would provide maximum value to the distribution grid.

The Project will leverage Tesla's active sales pipeline for BTM and remote projects to expedite customer acquisition in locations that provide greater system value. O&R will guide Tesla to finding locations well-suited for batteries to maximize T&D and host benefits.

2.1.2 FTM Remote Solar plus Storage Sites

The second segment of the Project will consist of 1 to 2 sites that seek to demonstrate the economic value of, and operational challenges associated with, integrated solar plus energy storage. Tesla will construct and own an aggregated total of 2MW/4MWh of battery storage paired with solar. The batteries will charge mostly from the solar energy generated by the co-located solar generating system during the Investment Tax Credit ("ITC") recapture period of the first five years. The ITC applies to storage charged from solar and the storage credit is limited by the percentage of renewable input. The ITC provides an economic benefit to co-locating solar with storage, which will be used to offset the costs of the overall solar plus storage system. The assets will provide grid services as the first

priority and participate in wholesale markets during other times when it is not needed by the utility. As with all value-stacking projects, optimization and coordination across stakeholders will be critical to the success of the Project.

2.2 Project Plan

O&R in partnership with Tesla will implement the Project in three phases. Within each phase are associated tasks and activities, which will be tracked and managed by the project management team and reported to the Commission and Department of Public Service staff ("Staff"). Please see *Table 2.2* below for a summary of the overall plan.

Table 2.2: Project Phases

Phase	1	2	3
Timing	10-16 months	8-10 months	24-36 months
Objective	Customer Adoption / Site Selection	Operational Control and Dispatch	Wholesale Market Participation

The Project's work plan and budget are part of this living document. Start and end periods of each task and activity may occur earlier or later in the schedule due to various inputs and risks which include, but are not limited to, customer feedback, customer participation, and systems integration. The key milestones for this Project align with the completion of each phase, meeting the checkpoints within the stage and demonstrating phase success. O&R, together with Tesla, will monitor progress and milestones through various checkpoints, and will report to the Commission quarterly. Reporting will conform to the Commission's direction and Section 5 of this Project Implementation Plan, Reporting Expectations. For additional details regarding timing of phases and sub-tasks, please see Appendix 1.

2.2.1 Phase 1 – Customer Adoption and Site Selection

Phase 1 will focus on C&I host customer adoption and site selection for the solar plus storage deployment, along with construction and commissioning of the assets. Phase 1 will last approximately 10-16 months, and will partially overlap with the tail-end of scoping and contracting efforts. Coordination between Tesla's and O&R's planning, engineering, and customer teams is critical for Phase 1 success. For the BTM applications, key activities include financial and operational analysis to identify potential host C&I customers, and engaging and contracting with the customer. For the FTM application(s), key activities include financial and operational analysis to identify high potential solar plus storage sites, land acquisition and permitting. For both BTM and FTM applications, Phase 1 will conclude with design, engineering, permitting, procurement, construction, interconnection, and commissioning of the assets. The project team expects initial assets to come online 6-9 months from contract execution.

2.2.2 Phase 2 – Operational Control and Dispatch

Phase 2 will focus on testing and optimizing operational control and dispatch of the BTM and FTM assets. Phase 2 will last approximately 8-10 months, and will partially overlap with interconnection and commissioning activities during Phase 1. Specific activities include gathering operational data, testing communications and monitoring, setting operational parameters, rolling-out dispatch procedures and processes, and training O&R personnel on Tesla's GridLogic software. GridLogic is Tesla's proprietary software, which will allow O&R operators to communicate and coordinate daily dispatch, and monitor operational performance of the energy storage assets. Finally, Phase 2 will conclude with a risk assessment, which will be leveraged heading into Phase 3.

2.2.3 Phase 3 – Wholesale Market Participation

Phase 3 will focus on participating in the NYISO's wholesale marketplace and optimizing the multi-use operational model. Phase 3 will begin once the BTM and FTM assets are commissioned, and will last 24-36 months. Key activities include registering for NYISO participation, deploying procedures and processes for bidding into the wholesale market, and optimizing dispatch to achieve value across the wholesale, demand charge, and infrastructure deferral value streams. A critical component of Phase 3 is continuous assessment of applicable wholesale programs and products to provide maximum value. Because storage-related policies and market opportunities are evolving, the project team will identify and adjust to future opportunities.

2.3 Test Statements

This Project Implementation Plan outlines the hypotheses being tested as they pertain to BTM and FTM deployments. The main hypotheses being tested is that optimization and increased utilization of both deployments may lead to stacked value streams for multiple stakeholders (e.g. grid benefits for utilities, reduced demand charges for C&I customers, and wholesale revenues for utilities and third-party partners). Additional hypotheses to be tested are outlined in *Table 2.3*, below.

Table 2.3: Test Statements

Test Statement	Hypothesis
1) **We Believe**...C&I customers will realize demand charge reduction benefits from hosting a battery energy storage system ("BESS").	**If**...we can identify host C&I customers who have high, concentrated load, and are interested in partnering in the project... **And If**...we can install and commission at least two (2) BTM systems at C&I host customers, nine (9) months after contract execution... **Then**...customers can realize demand charge savings during the Demonstration Period (Years 1 through 3).
2) **We Believe**...BESS assets can be used to provide the Utility with distribution deferral benefits.	**If**...the asset(s) can be dispatched to relieve a distribution system constraint, or respond to a contingency event... **Then**...O&R will realize distribution deferral benefits during the Demonstration Period (Years 1 through 3).
3) **We Believe**...BESS assets will realize wholesale market and platform service revenues ("PSRs").	**If**...the BESS can be dispatched into the wholesale markets... **Then**...in the near term, the FTM assets can participate in the NYISO's Energy Limited Resource program, and the BTM assets can participate in the Day Ahead Demand Response Program, Demand Sided Ancillary Services Program, and Special Case Resource Program to generate revenues... **And Then**...in the long term, the project team will regularly assess market opportunities, and adjust registration and operational approaches to participate in evolving and emerging NYISO market products and programs...

	And If...O&R establishes a scheduling coordinator function... **Then**...this will enable O&R to earn PSRs, and ultimately transition into a DSP.
4) **We Believe**...BESS assets can be operated to drive benefits for all three participating stakeholders.	**If**...the Utility can identify and communicate distribution system constraints and needs, and bid into the wholesale market... **And If**...Tesla can optimize operational dispatch using Tesla's proprietary GridLogic and optimization modeling software... **Then**...the asset(s) will be dispatched to increase utilization, relative to single use-case deployments, and all stakeholder groups will realize meaningful net benefits, as defined in Test Statements 1 to 3, over the Demonstration Period (Years 1 through 3).

2.4 Test Scenarios

This Project will test multiple scenarios across each of the implementation phases. Each phase will address unique REV demonstration principles. Due to the dynamic energy environment and policy advances anticipated over the demonstration period, adjustments to the scenarios are expected. Changes will be highlighted and reported to the Commission during the quarterly reporting process. Test scenarios are outlined in *Table 2.4*, below.

Table 2.4 Test Scenarios

Scenario	Description
Host BTM C&I Customer Test	This test will support the hypothesis in Test Statement 1 and will take place during Phase 1. O&R and Tesla will collaborate to partner with approximately 2 to 8 C&I customers to develop a BESS portfolio of 2MW/4MWh. During the Customer Engagement task within Phase 1, O&R will identify high-potential C&I host customers whose (1) load is driven by periods of concentrated high load ("peaky"), (2) load is greater than 250 kW, (3) load is coincident with the local distribution circuit peak, and (4) load is coincident with local area peak. Using C&I customer load data, Tesla will analyze opportunities for demand charge reduction. If the opportunity exists, Tesla will notify O&R of its intent to engage specific C&I customer and engage customers to assess interest in reviewing an agreement. The target for this test will be to agree to terms with at least 2 C&I host customers to site BESS at their locations. Two sub-goals within this test include (1) maintain size diversity of BESS for procurement purposes, and (2) maintain overall BTM portfolio size of 2MW/4MWh to support operational comparison with FTM portfolio of similar size. Recognizing the importance of customer acquisition, O&R and Tesla will work closely to expedite the customer partnership process.

Optimization / Dispatch Test	This scenario will support the hypothesis in Test Statements 2 and 3 and will take place during Phase 2. This test will demonstrate the technical capability of the assets, both individually and in aggregate and will aim to provide visibility, dynamic control, and reliable response to the Company for identified use cases for a designated operational period. This phase will also lay out a process through which O&R and Tesla will work together to efficiently monitor and control the assets. This phase will test if distributed energy storage assets can respond to market and/or operational dispatch signals in near real-time to provide a suite of distribution and bulk grid services that may include energy, ramping, dynamic capacity, and reactive power support, depending on the needs of the local or bulk grid at a given time. This will test the system control through communications protocols. The dispatch will simulate the way a future DSP would operate or trigger the dispatch of storage assets throughout its network. • Tesla and O&R will coordinate so that locations chosen for the Project will provide T&D benefits while still providing demand charge reduction to BTM customers. The Project will lay out a framework for an enhanced communication mechanism between a third-party developer (Tesla) and the utility (O&R). • O&R will coordinate with Tesla to operate and dispatch the storage units for grid benefits purposes and identify any operational constraints.
Wholesale Market Test	This scenario will support the hypotheses in Test Statement 3, and will take place during Phase 3, when the team will use lessons learned from the technical demonstration to develop fully integrated NYISO market operations that will test the viability of stacked value streams to serve all stakeholders in an optimal protocol. Phase 3 will assess the potential of bidding into wholesale markets under various NYISO market products. In addition, the magnitude of the wholesale revenues based on dispatch methodologies will be determined, and the viability of whether the multiple services result in a positive net revenue stream will be determined. • O&R and Tesla will quantify the earning potential of the storage from each of the wholesale market products. • O&R and Tesla will analyze how these earnings will help to offset the overall cost of the battery storage services for future iterations of this business model. • O&R and Tesla will track variance in forecasted and actual revenues for BTM and FTM deployments. For the FTM portfolio, the assets will primarily charge from solar and recoup the Investment Tax Credit, and will participate in the following NYISO programs: • Capacity – Energy Limited Resource (“ELR”). For the BTM portfolio, the assets will participate in the following NYISO programs: • Capacity – Special Case Resource (“SCR”); • Ancillary Services – Demand Side Ancillary Services Program (“DSASP”); and

	• Energy – Day Ahead Demand Response Program ("DADRP"). Over the course of the project, wholesale markets will evolve, and the role of energy storage in the marketplace will likely expand. As this happens, the project team will adjust the optimization model accordingly and may participate in additional models, not listed above.

2.5 Project Checkpoints

Scenario	Description
Demonstration Planning, Site Selection, and Design (Phase 0-1)	**Measure:** Finalize agreements, partner with host C&I customers and complete siting, and complete design and construction. **When:** • Finalize agreement between O&R and Tesla by end of Phase 0. • Identify and partner with C&I host customers, site FTM assets, and design and construction will be complete by the midpoints of Phase 1. **How:** • Tesla and O&R will have bi-weekly meetings to discuss design, construction, and commissioning until the full portfolio has achieved commercial operation. **Expected Target:** • O&R-Tesla agreement(s) to be finalized within 2 months of Project Implementation Plan submission. • Engineering design, and identification and partnership with BTM C&I customers are to be completed within 6 months from completion of Phase 0. **Impact:** • Inability to identify and/or partner with host C&I customers will prove hypothesis 1 to be untrue. • Inability to execute Phase 0-1 tasks in a timely and cost-effective manner will challenge the practicality of scaling this model. **Mitigations:** • O&R and Tesla may expand the C&I customer candidate pool who are willing to partner with O&R and Tesla to host the demonstration project. • Tesla will continually evaluate progress to identify issues in advance. • Tesla and O&R may engage authorities having jurisdiction ("AHJ") in O&R territory to support and make changes for permitting approvals.
Operational Control and Dispatch (Phase 2)	**Measure:** Monitoring and control of the portfolio of batteries both individually and in aggregate as they participate in multiple value streams. **When:** Midpoint of Phase 2. **How:** Dispatch performance metrics to be reported in quarterly Commission reports. **Expected Target:**

	• Phase 1 Start: O&R will identify potential BTM customers and potential O&R load areas that may be suitable for FTM energy storage deployment; Tesla will reach out to proposed BTM customers and start initial customer acquisition discussions. • Phase 2 Start: Tesla will acquire BTM customers as per guidance provided by O&R. • Phase 2 Middle: Tesla successfully deploys aggregation to provide local services/optimization and support grid needs. • Phase 3 End: Tesla and O&R continues to work together in order to dispatch aggregation for grid services and incorporates lessons learned to improve operational efficiency. **Impact:** • Inability to use BESS assets to reduce C&I host customer demand charges will prove hypothesis 1 to be untrue. • Inability to leverage BESS assets for distribution needs will prove hypothesis 2 to be untrue. **Mitigations:** • Tesla will continually evaluate progress to identify any issues in advance. • O&R and Tesla will meet on a bi-weekly basis to assess progress, identify hurdles, and adjust the project plan, as needed.
Wholesale Market Participation (Phase 3)	**Measure:** Earn revenues through NYISO wholesale participation. **When:** Midpoint of Phase 3. **How:** Gather and analyze settlement data from CECONY Energy Management group. **Expected Target:** • Phase 2 End: Confirm registration and ability to participate in NYISO wholesale marketplace. • Phase 3 Midpoint: Ability of scheduling coordinator to dispatch in accordance with various competitive market participation models. **Impact:** • If assets are unable to realize wholesale revenues, hypothesis 3 may not hold true. **Mitigations:** • O&R has engaged with the NYSIO, Tesla, and relevant internal resources to identify applicable wholesale market participation models. • O&R has begun coordinating internally so that processes and resources are available to perform operational checks, and to bid Project assets into the wholesale marketplace. • As NYISO participation models evolve, O&R and Tesla will adjust the optimization model accordingly.

2.6 Project Metrics

2.6.1 Primary Metrics

Project success will be measured using the three metrics set forth in *Table 2.6.1*, below. These metrics will be measured and calculated as described in the table and reported to the Commission on a quarterly basis.

Table 2.6.1 – Primary Metrics

Primary Metric	Reporting Begins	Description

C&I Customer Demand Charge Reduction	**Phase 2**	• **Description**: To assess the ability of BESS assets to operate to reduce host customer's demand charge. • **Calculation**: $Demand\ Charge\ Reduction = (Demand\ Charge) * (Peak\ Demand\ before\ Storage - Peak\ Demand\ After\ Storage)$ • **Target**: [redacted] in demand charge savings during the Demonstration Period (Years 1 through 3)
Distribution System Benefit	**Phase 2**	• **Description**: To assess the ability of BESS assets to operate to meet distribution system needs. • **Calculation**: $Distribution\ System\ Benefit = BESS\ Capacity * [(Marginal\ T\ Cost * (T\ Coincidence\ Factor) + (Marginal\ D\ Cost) * (D\ Coincedence\ Factor)]$ • **Target**: [redacted] in distribution deferral benefits during the Demonstration Period (Years 1 through 3).
Wholesale Market Revenue	**Phase 3**	• **Description:** To assess the ability of the Scheduling Coordinator to coordinate dispatching and bidding, and the ability of the system to participate in the NYISO wholesale marketplace. • **Calculation**: Sum of various revenue streams. • **Targets**: – FTM: [redacted] in revenue from the NYISO's ELR program during the Demonstration Period (Years 1 through 3), and – BTM: [redacted] in revenue from NYISO's DSASP, DADRP, and SCR program during the Demonstration Period (Years 1 through 3).
Capacity Factor	**Phase 3**	• **Description:** To assess utilization of the overall BESS. • **Calculation:** $Capacity\ Factor = \frac{Actual\ Output}{Maximum\ Output}$ • **Target**: Project team currently developing utilization targets based on performance of operational single-use case deployments.

2.6.2 Secondary Metrics

The Project Team will monitor secondary metrics as additional indicators of project success. Secondary metrics will be used as supporting evidence to gain additional insight into project performance.

Table 2.6.2 – Secondary Metrics

Secondary Metric	Description
Host BTM C&I Customer Test Metrics	
C&I Host Customer Potential	• **Description**: To assess the pool of candidate customers within the Utility's service territory. • **Calculation**: This metric will be measured by counting the number of C&I customers who meet the following criteria: (a) load > 250kW, (b) load is coincident with local circuit peak, (c) local circuit peak has a system need, and (d) load is Peaky. These customers will be called "Potential Customers."

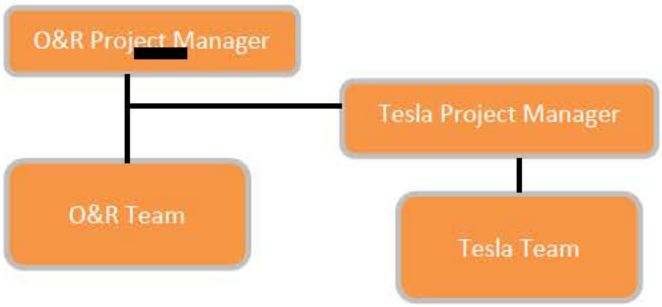
C&I Host Customer Interest	• **Description**: To assess customer interest in siting BESS and partnering with developer and Utility. • **Calculation**: Number of customers who provide consent to share usage data with third-party. These customers will be called "Interested Customers."
C&I Host Customer Interest Rate	• **Description**: To assess customer interest in siting BESS and partnering with developer and Utility. • **Calculation**: (Number of Interested Customers) / (Number of Potential Customers).
Opportunity for Demand Charge Reduction	• **Description**: To assess the opportunity for using a battery to drive C&I demand charge reduction. • **Calculation**: Number of Interested Host C&I Customers, whose load profile is such that a battery would be economically feasible to reduce the customer's demand charge. These customers will be called "Priority Customers."
Opportunity for Demand Charge Reduction	• **Description**: To assess the opportunity for using a battery to drive C&I demand charge reduction. • **Calculation**: (Number of Priority Customers) / (Number of Interested Customers).
C&I Customer Commitment	• **Description**: To assess the commitment of Priority Customers to sign an agreement with Tesla to host a BESS. These will be called "Committed Customers." • **Calculation**: (Number of Committed Customers) / (Number of Priority Customers).
Operational / Dispatch Test Metrics	
Utilization	• **Description**: To assess utilization of BESS assets. • **Calculation**: (BESS operational time) / (total time).
Utilization	• **Description**: To assess utilization of BESS assets. • **Calculation**: # of days BESS is called upon.
Reliability	• **Description:** To test system ability to respond to operational needs, when called upon. • **Calculation**: (# of times system is called upon, and responds) / (# of times system is called upon).
Distribution Usage	• **Description**: To assess BESS usage for distribution deferral needs. • **Calculation**: # of times BESS is called upon for distribution needs.
C&I Customer Usage	• **Description**: To assess BESS usage for C&I customer demand charge reduction needs. • **Calculation**: # of times BESS is called upon for C&I customer needs.
Response Time	• **Description:** To assess understand lag between O&R providing Tesla with requested near real-time operational change, and when the operational change is actually made. • **Calculation:** (Time change is made – Time change is operational change is made) – (Time O&R Requests Operational Change).

3 Project Structure and Governance

3.1 Project Team

The Project is a partnership between O&R and Tesla. Each partner will provide key skillsets and be responsible for certain Project functions in order to execute a successful demonstration project. O&R will maintain overall responsibility for Project execution; Tesla is a key contributing partner. The high-level Project team makeup and alignment are depicted in *Figure 3.1.1*.

Figure 3.1.1: Team Leadership/Organization



O&R will facilitate interaction with its existing commercial customers and apply the skillsets of its team aligned with its roles and knowledgebase as a utility. O&R will guide Tesla to O&R's customers with load profiles that are well-suited for the services that battery technology can provide while also providing load relief to the grid. O&R's Project Manager will have overall responsibility for the success of the Project and will plan, coordinate, and manage activities for the scope and duration of the demonstration. Utility and Partner skillsets are outlined in *Table 3.1.2*, below.

Table 3.1.2: Utility and Partner Skillsets

O&R Team Key Skillsets	Tesla Team Key Skillsets
• Program Management • Marketing ○ Initial co-ordination with possible BTM customers • Local Distribution Expertise • Technology Engineering • Customer data (i.e. peak loading) • Legal • NYISO Market Expertise	• Sales and Marketing • Project Management • Channel Operations • Engineering • Solar and Storage Technology • Operations and Maintenance • Systems Integration • Software Communication and Controls • Project Finance • Contracting/Financing • Customer Relationship, Offer, and Service

Tesla develops, finances, designs, installs, operates, and maintains solar PV and energy storage in residential, commercial, remote net metered, and utility settings. It has a proven history partnering with utilities around the country in expanding DER awareness and introducing DERs into the grid. Tesla will provide its skills and knowledge in solar PV and energy storage, matching its product to the market and ability to engage customers. Tesla's Business and Relationship Lead will have overall responsibility to coordinate and align its efforts within this Project Implementation Plan.

3.2 Project Staffing

O&R has assembled a REV demonstration program team within its Utility of the Future department dedicated to identifying, developing, and implementing new projects related to REV. From this team a Project Manager has been identified to lead the Project. In addition, O&R will provide the necessary internal and external resources in key areas (e.g., marketing, information resources, legal, procurement, and engineering) to augment and support demonstration

activities and objectives. O&R's team members are listed in *Table 3.2.1* along with their functional areas and current duty titles.

Table 3.2.1: O&R's Project Team

Team Member	Title	Functional Area
• Brian Picariello	• Project Manager	• Utility of the Future
• MD Sakib	• Section Manager	• Utility of the Future
• Jeff Peifer	• Project Manager	• Utility of the Future
• Roberta Scerbo	• Director	• Utility of the Future
• Kevin Hernandez	• Scott Madden	• Consultant

Tesla is a committed partner for the Project, and will assign a Project Manager who will lead the management and integration of Tesla's activities into the overall Project scope and plan. In addition, Tesla will provide the Company with functional expertise (e.g., product marketing, operations and maintenance, and engineering and design) to execute demonstration tasks and activities. A list of Tesla's team members, along with a description of their titles and functional areas can be found in *Table 3.2.2*, below.

Table 3.2.2: Tesla's Project Team

Team Member	Title	Functional Area
• Nick Walsh	• Project Manager	• Team and Project Lead
• Carlos Gonzalez	• Senior Manager	• Grid Services
• Anastasia Beckett	• Sr. Manager, Customer Operations	• Sales
• Maud Texier	• Senior Manager, Industrial Product Manager	• Product Management
• Julia Collignon	• Director, Operations	• Design Engineering
• Annie Young	• Manager, Project Design and Engineering	• Project Design and Engineering
• Rohan Ma	• Sr. Manager, Economic and Market Optimization	• Optimization, Communications and Dispatch

3.3 Roles and Responsibilities

The Project team has developed a work plan, see Appendix 1, with specific tasks and activities aligned to the Project timeline and overall success. The breakdown of roles and responsibilities is provided in this section.

3.3.1 Phase 0 – Demonstration Planning

The initial stages of the demonstration will be focused on obtaining implementation approval from Staff and finalizing the agreements between O&R and Tesla.

Table 3.3.1: Phase 0 – Demonstration Planning

Lead Responsibilities	O&R	Tesla
Partnership Agreement		
O&R will enter into an agreement with **Tesla** to delineate roles and responsibilities with respect to the Innovative Storage Business Models Demonstration project execution.	X	X
C&I Customer Contract Development		
Tesla will develop the C&I customer contract with respect to installing storage capacity, reliability payments, demand charge reduction guarantees, and shared dispatch requirements.		X

Lead Responsibilities	O&R	Tesla
O&R will support Tesla's contract development efforts and approve operational constraint terms as agreed upon.	X	

3.3.2 Phase 1 – Customer Adoption and Site Selection

In Phase 1, Tesla will be responsible for installing and commissioning 4MW/8MWh of total storage capacity at the chosen site locations.

Table 3.3.2: Phase 1 – Customer Adoption and Site Selection

Lead Responsibilities	O&R	Tesla
Customer Engagement		
O&R will guide Tesla to O&R's customers with load profiles that are well-suited for the services that battery technology can provide while also providing load relief to the grid **Tesla** will leverage its existing customer relationships, and deployment experiences to procure the BTM customers as per guidance from O&R and also reduce risk to the Project.	X	X
Site Selection		
O&R will identify distribution load areas that offer the highest value opportunities for congestion relief and infrastructure upgrade avoidance or deferral. **Tesla** will identify C&I customers and remote net metered solar sites within the aforementioned identified locations; in the absence of viable customers or sites, Tesla may make use of customers or sites elsewhere in the territory.	X	X
Installation and Commissioning		
Tesla will use its vertically integrated network to deliver 8MWh of storage capacity in O&R territory at the completion of Phase 1.		X
Engineering and Design		
Tesla will lead the solar PV and storage engineering design and ensure the capability and demonstrate dispatchability.		X

3.3.3 Phase 2 – Operational Control and Dispatch

In Phase 2, O&R will link its distribution control centers with Tesla's control platform and demonstrate the ability to dispatch the deployed assets, individually or collectively in aggregate.

Table 3.3.3: Phase 2 – Operational Control and Dispatch

Lead Responsibilities	O&R	Tesla
Cybersecurity		
O&R will outline the requirements for cybersecurity.	X	
Tesla will assess the feasibility of deploying systems that meet O&R's requirements.		X
System Engineering and Optimization		
O&R will suggest potential integrations of the distribution control centers to Tesla's operation and control systems.	X	
Tesla is responsible for interoperability with the energy storage systems.		X
Dispatch Testing		
Tesla will design and build protocols that enable the multi-use coordination and operational control/dispatch architecture of the aggregation.		X
O&R is responsible for integrating with Tesla's software and executing testing to demonstrate system reliability.	X	

3.3.4 Phase 3 – Wholesale Market participation

In Phase 3, O&R will continue evaluating system dispatch and reliability, explore market conditions best suited to its participation, and test alternative dispatch approaches to optimally manage distributed storage systems to maximize revenue (or system cost savings).

Table 3.3.4: Phase 3 – Roles and Responsibilities

Lead Responsibilities	O&R	Tesla
Market Participation		
O&R will lead exploration of opportunities for aggregated energy storage participation in existing and future competitive markets.	X	
Tesla will provide communication, optimization functions, and architecture for multi-use dispatch for the energy storage aggregation.		X
Scheduling Coordinator		
O&R will serve the scheduling coordinator function.	X	

3.4 Governance

O&R will have overall responsibility for execution of the Project. The governance structure will encompass the Project management team, detailed in *Table 3.2.1*. The management team will have day-to-day execution responsibility for managing the Project, coordinating tasks and activities, and conducting overall Project management. The team will continuously coordinate activities throughout the Project. Team meetings will be held in-person, via conference calls, WebEx, or other communication means. The Project team will be responsible for coordination and execution of quarterly reports.

A dedicated O&R Project Manager will oversee the Innovative Storage Business Model ("ISBM") Demonstration Project. The Project falls under the O&R Vice President, Operations, which reports to O&R's President. Additionally, the O&R Utility of the Future group ("UotF"), reporting to the O&R Vice President, Operations, provides coordination, planning, progress tracking, and governance support to all REV initiatives, including the ISBM Demonstration Project.

The project team will consist of an O&R Project Manager and UotF project team within the organization described above. In addition, Tesla will maintain an internal project team managed by a Tesla Project Manager who will report to the O&R Project Manager. Subject matter experts from both O&R and Tesla will be brought into the Project, as necessary.

The ISBM Demonstration Project will be managed using commonly accepted project management standards and tools, such as an issues log, risk register, change log and project schedule, in order to meet project milestones on time and within budget. Risks, both internal and external, will be identified and managed according to documented risk management procedures including the identification, mitigation and reporting of risks to Project and Company leadership.

UotF leadership holds weekly coordination meetings to review progress, provide coordination and help resolve critical issues as they arise. Demonstration Projects are a standing item on the weekly meeting to review progress made and escalate issues such as resourcing, changes in scope, or externalities impacting the project. In addition, regular ISBM Demonstration Project meetings will be held between stakeholders so that project tasks are completed on schedule and to resolve any potential complications or project risks as they arise.

3.5 Risks

3.5.1 Wholesale Market Participation

Despite the promise that energy storage brings, the Company sees some risks to the implementation of storage in New York. The participation of energy storage resources in the wholesale market is key for the financing of many energy storage projects providing an alternative revenue stream that drives overall cost-effectiveness and lowers system costs.

Consequently, the ability of energy storage to participate in wholesale markets is necessary for energy storage to realize its potential. With FERC's recent Order 841, requiring RTOs/ISOs to develop market participation models for energy storage, it is increasingly likely that there will be some opportunity for energy storage to realize wholesale market benefits in New York. However, until the details of what markets will be available and how energy storage will be allowed to participate (and at what level of compensation) there is still some uncertainty of the impact that opening the wholesale market will have. The NYISO Energy Storage Roadmap, expected in the late fall of 2018, will be an important step in mitigating this risk.

3.5.2 Siting and Permitting

Although the Company is new to implementing energy storage projects, siting and permitting has emerged as an area that could significantly impact the development of projects, particularly in the early days of energy storage where there is low familiarity with the technology. Siting and permitting processes often take weeks to months to navigate for typical projects. Energy Storage presents some new challenges in terms of informing local authorities about the benefits and risks of the technology. The Company has taken the initiative to address these concerns by meeting with local officials to discuss energy storage, its role and its impact on their communities. As part of the Company's non-wires alternatives and demonstrations projects, O&R will be partnering with its vendors and partners to continue that education process.

4 Project Budget

O&R's Project Manager will be responsible for managing and tracking the Project's costs and overall budget. The quarterly report to the Commission will provide budget updates and align with the project plan in Appendix 1. Tesla will provide updates to the Project Manager for inclusion in the quarterly report.

Project implementation costs will include the energy storage systems, balance of system components, installation and associated operations and services, sales, marketing, customer acquisition and education, fees for development and implementation of the program, operation and maintenance of the software platform, GridLogic, and integration of GridLogic into O&R's communication and control systems, project management (FTE time) and scheduling coordinator fees. The budget estimates provided in *Table 4* calculated estimates over the course of the Project and are not adjusted for inflation. Changing budget estimates will be reflected in the quarterly reports to the Commission.

The demonstration will examine several potential revenue streams that may not be actually monetized over the timeframe of the demonstration project due to wholesale market restrictions and the timing for O&R's next rate filing. However, detailed operational data and potential project revenue will be tracked and analyzed to be presented in quarterly reports. Changes in Project scope, outcomes of the REV proceedings, and subsequent Commission orders may impact revenue estimations.

Orange & Rockland

Table 4: Innovative Storage Business Models Project Budget ($000)

	2018	2019	2020
O&R Contribution:	$1,811	$1,888	$1,890

5 Reporting Expectations

The Company will provide quarterly reports to the Commission during the Project. The reports will provide an update on implementation progress according to the work plan and budget, detailing deviations, and noting task and activity progress. In addition, each quarterly report will capture, to the extent available, key project information, such as in-service dates, incremental costs incurred, operating results, and market learnings, as well as other observed project benefits.

The quarterly report will focus on the phase(s) occurring within the previous quarter and scheduled to occur within the next two quarters, providing a focus on current progress while providing Staff insight into the near future. The governance structure and program management team will maintain oversight over all Project progress and include any impacts on the implementation execution that may extend beyond the report's timeline.

Checkpoint, milestone, and activity progress will provide detailed status information to inform the Commission of implementation progress and highlight issues, such as changes in scope, incremental cost, or shifts in timeline. A stoplight chart will be used to detail progress for activities in the quarterly reports. O&R will provide narrative information to support the progress report. Tesla-related data will be provided confidentially to Staff. The quarterly report template will be as follows:

Table 5: Quarterly Report

1.0 Executive Summary
2.0 Demonstration Highlights
  2.1 Since Previous Quarter
    2.1.1 Major Tasks Completion
    2.1.2 Activities Overview
    2.1.3 Sub-Activities Overview
  2.2 Next Quarter Forecast
    2.2.1 Checkpoints/Milestone Progress
    2.2.2 Planned Activities
    2.2.3 Expected Changes
  2.3 Issues
3.0 Work Plan and Budget Review
  3.1 Phase Review
    3.1.1 Activity 1.0
      - Progress Assessment
      - Issues
  3.2 Work Plan
    3.2.1 Table 3.2.A – Updated Work Plan
    3.2.2 Table 3.2.B – Updated Budget
4.0 Conclusion
  4.1 Lessons Learned
  4.2 Recommendations

6 Appendix

6.1 Appendix 1 – Project Plan