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February 6, 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 proposed 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

Innovative Storage Business Model
REV Demonstration Project

Contents

1 EXECUTIVE SUMMARY

Energy storage is a key distributed energy resource ("DER") with the potential to support the goals of the New York State Public Service Commission's ("Commission") Reforming the Energy Vision ("REV") initiative through its ability to improve the overall efficiency of the bulk power system, while also providing benefits to customers and the distribution system. Despite the technical potential of energy storage, there are currently few projects demonstrating sustainable business models that fully exploit the flexible capabilities energy storage can deliver across multiple stakeholders (e.g., deferred capital T&D investments for utilities, bulk system benefits from the assets participating in wholesale marketplaces, and behind-the-meter demand charge reduction for C&I customers).

Orange and Rockland Utilities, Inc. ("O&R" or the "Company") will collaborate with Tesla on a project (the "Project") to demonstrate an innovative business model that has the potential to identify and 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 applications (e.g., deferred T&D costs, wholesale revenue, and reduced demand charges) by maximizing storage utilization and will develop the business model that allows for 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 for how 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 distributed and located either behind-the-meter ("BTM") of commercial and industrial ("C&I") customers[1] or co-located with 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 benefits and operational priority of the entire aggregation through a contract with Tesla for energy storage grid services. Batteries deployed behind-the-meter of C&I customers will also reduce the host customer's demand charges. Tesla will work with O&R to develop innovative, multi-use operations strategies to balance dispatch among stakeholder groups. These stakeholder groups include participating customers, the distribution system, and Tesla. These strategies will be guided by algorithms and protocols, designed by Tesla, to deliver optimal dispatch for the aggregated portfolio, maximizing the portfolio value among customers, the distribution grid, and Tesla. Under this demonstration, the flexible operating characteristics of

[1] For batteries installed at C&I host customer sites, Tesla also will deploy solar if the economics are viable for the customer at the time. However, Tesla will deploy batteries without solar if the economics for the project is favorable.

distributed energy storage will be employed to obtain the highest value use of the resource at any point in time.

2 BUSINESS MODEL OVERVIEW

The Project will demonstrate the unique range of services that distributed energy storage can provide to multiple stakeholders (i.e., T&D system, C&I customers and NYISO wholesale system) in order to achieve a diversity of "stacked" value streams (see financials in Section 5 for detail). Stacking storage value streams will improve economics over single-use models and reduce barriers to deployment. Maximizing stacked values will require operational flexibility and coordination across multiple parties which do not currently exist today. This Project will demonstrate these processes and the role of the utility to serve as the distributed platform provider in order to enable and achieve the multiple value streams tested under the Project.

2.1 CHALLENGES

The potential of distributed energy storage as a grid resource includes its capability to deliver a variety of benefits to multiple stakeholders including customers, the distribution system, and third-party energy storage providers. However, despite its technical potential, one of today's overarching challenges is a lack of regulatory and market mechanisms to allow storage projects to spread costs and deliver benefits across multiple stakeholders. The lack of workable business models that can properly value the benefits of distributed energy storage serve to limit deployments in New York.

By developing the financial, contractual and operational structures necessary to facilitate the sharing of energy storage costs and benefits among multiple stakeholders, the Project will provide a concrete demonstration of a business model that enables energy storage assets to deliver value across multiple applications. In developing the Project, and the supporting business model, the Company will address a number of underlying challenges for energy storage that are currently constraining deployment.

Single-use model limitations[2]
Due to the ability of energy storage to provide multiple services with a single asset, single-use energy storage business models can lead to asset underutilization, and an inability to maximize the value of the investment. If storage is only used by a single application for a limited service, the true potential of energy storage may not be realized, and benefits may be insufficient to offset costs. Therefore, there is a need for resource sharing models that address the underutilization of single-

[2] Fitzgerald, Garrett, James Mandel, Jesse Morris, and Hervé Touati. *The Economics of Battery Energy Storage: How multi-use, customer-sited batteries deliver the most services and value to customers and the grid.* Rocky Mountain Institute, September 2015. <<http://www.rmi.org/electricity_battery_value>>

use models and facilitate the inherent flexibility of energy storage to reduce the overall cost of energy storage for any single application. Reducing overall cost to all users is critical to the economics of deploying energy storage assets and animating the energy storage market in New York.

Demand Charge Reduction

For many C&I customers, electric demand charges can comprise up to 70% of their electric bill. Many C&I customers are receptive to innovative ways to manage their demand charge. The most common application for energy storage in New York is demand charge reduction, however, the market size for deploying this model is limited. While C&I customers can use energy storage systems ("ESS") to reduce their peak electricity demand in order to pay lower demand charges, typically, they will do so when the savings generated are greater than the cost of the ESS. As a result, currently single-use energy storage business models are economical for customers with high demand charges and peaky loads (i.e., where the savings from demand charge reduction exceed the cost of the ESS). At current ESS costs, the benefits of near-term energy storage deployments for demand charge reduction in O&R's service territory are limited by high system costs.

Behind-the-Meter ("BTM") Storage's Value Proposition

BTM energy storage is not always able to provide benefits to the distribution system. This has prevented the BTM model from capturing an additional revenue stream from the utility. The reasons for this nominal grid value stem primarily from a lack of coordination between developers and the utility. This results in a misalignment in dispatch, location and size of the ESS. If the customer's peak load does not align with utility's distribution system peak, the distribution system would receive very minimal benefits for reducing an individual C&I customer's peak. This is because the total value of distribution peak will not be affected by the reduction in C&I customer's load. For example, a customer may reduce their own peak demand at 5 PM, which provides minimal distribution grid benefit if located on a distribution circuit which peaks from 8-12 PM.

Current BTM project economics incentivizes ESS sizes that solve only for building needs, rather than larger systems that could solve grid needs, thereby reducing grid benefits and surrendering economic efficiency associated with larger ESS installations.

Multiple usage and availability of resources

Multi-use applications can increase ESS's market value assuming operations and dispatch decisions are properly made across multiple constraints with multiple objective functions. However, this introduces complexity and triggers the need for advanced dispatched methodologies that have rarely been applied to ESS operations in a practical setting. Ideal asset dispatch will consider all known information about costs, values, and constraints associated with each energy storage use case, as well as operational information about each ESS's capabilities and system state.

Complexity is increased by the uncertainty around underlying parameters that serve as inputs to enhancing incentives from the various value streams. Parameters such as availability of the ESS (based on multiple dispatch requirements), market condition forecasts and distribution system needs introduce variability and uncertainty that must be understood before dispatching energy storage assets. Also, dual participation in the New York Independent System Operator ("NYISO") market and transmission and distribution ("T&D") cost deferral is largely untested. Actual data-sets on ESS availability and performance metrics for wholesale marketplace are scarce. Lack of

operational data and experience for multiple uses and impact on resources has inhibited the development of means to navigate this complexity and refine optimization algorithms. Operational data from batteries participating in the NYISO market is important to analyze, so that the NYISO marketplace can properly incentivize the ESS to enable true value stacking and allow for greater utilization.

Leveraging DER for grid benefits (T&D Deferral)
Benefits stemming from energy storage are location-specific. If the location of an ESS is chosen strategically, it can provide simultaneous benefits by participating in multiple value streams. Attention should be paid, while acquiring customers, so that the customer's peak load timeframe is coincident with the utility's distribution system peak loading timeframe. This will require close co-ordination between the utility and the third-party developer. Such a relationship is critical to acquiring customers who are willing to participate in the multi-use model program.

Limited Data for Energy Storage Technology
Utilities currently have limited visibility and operational control of third-party owned DERs, which limits their ability to leverage these assets for grid benefits. With the deployment of AMI and smart inverters, utilities will have an opportunity for enhanced monitoring and control capability. However, utilizing these DERs in daily operation and long-term planning of the distribution system is just being introduced into utility procedure. There is a lack of confidence on the long-term value of energy storage due to limited data on deployed energy storage projects for T&D applications.

Capital markets need performance data to scale
Due to the nascent development of multi-use applications and related business models, investors may perceive higher than necessary levels of financial risk. The lack of operational data and a successful track record of generating revenue from multi-use applications limit capital markets from financing DERs and pursuing multiple revenue streams. Demonstrating these business models will provide support for future DER investment.

2.2 SOLUTION

The Project seeks to demonstrate that energy storage can provide increased value to a variety of stakeholders through the stacking of multiple applications. Through a multi-use model, storage can provide stacked value to customers, the utility, third-party partners (i.e., ESS developers) and wholesale market participants, through a portfolio of aggregated energy storage. As described in the following section, this business model increases the asset utilization to fully take advantage of the asset's potential and improve economics to expand market size.

Project Phases
The Project will be conducted in three phases. Phase 1 will center on customer acquisition and site selection. Phase 2 will concentrate on technical performance of asset response and flexibility. Phase 3 will focus on additional market participation and stacking value streams. The Project's phases will overlap so as to promote the efficient execution of the Project.

Demonstration Project Phases			
Phase	1	2	3
Timing	10-12 months	8-10 months	24-26 months
Objective	Customer Adoption / Site Selection	Operational Control and Dispatch	Wholesale Market Participation

Although the demonstration period is limited to three years, the ESSs deployed and operated through this demonstration are estimated to provide benefits to O&R and its customers over ten years while delivering value to key stakeholder groups including host customers, the Company, and Tesla and will continue to be monitored beyond the demonstration period.

Model to be Tested

The Project will test two similar, but distinct portfolios: 2MW/4MWh aggregated BTM C&I applications and 2MW/4MWh of Remote Solar + Storage. Both portfolios will demonstrate the allocation of costs, benefits and risks of energy storage projects to different stakeholders in order to reduce the deployment barriers that are associated with energy storage today. The Project will demonstrate a viable business model in which all parties may receive net benefits.

Demonstration Project Overview

<table>
<tr><th>Segment</th><th>BTM C&I</th><th>Remote Solar + Storage</th></tr>
<tr><td>Storage capacity</td><td>2MW/4MWh</td><td>2MW/4MWh</td></tr>
<tr><td>Estimated number of sites</td><td>2-8</td><td>1-2</td></tr>
<tr><td rowspan="3">Value Streams Demonstrated</td><td colspan="2">NYISO Market Participation</td></tr>
<tr><td colspan="2">Utility T&D Support</td></tr>
<tr><td>Customer Demand Charge Management</td><td>N/A</td></tr>
</table>

Phase 1 of the Project will involve Tesla acquiring customers for both BTM and Remote Solar + Storage program. O&R will review the load shapes of the customers acquired by Tesla so that the customer's load characteristics fit the needs of the multi-user business model. The different customer segments are mentioned below.

BTM C&I: Each site is anticipated to consist of a 250-500 kW battery system with two hours of capacity designed for customer demand charge management. This segment of the Project will demonstrate aggregating a portfolio of BTM installations to provide a combined 2 MW/4MWh asset with the ability to provide grid services to O&R, demand charge reduction to the host customers and ancillary services to the NYISO wholesale market. Under this structure, Tesla will own the assets and the costs of the total installation will be shared across the utility, host customers and Tesla. Host customers will 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. By sharing the benefits and costs with O&R and TESLA, C&I customers will have the opportunity to leverage BTM ESS at a much lower cost than previously.

Remote Solar + Storage: The second segment of the Project demonstrates the economic value of, and operational changes associated with, integrated solar plus energy storage. Tesla will construct and own 2 MW/4 MWh of battery storage paired with solar. The batteries will charge only 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 only 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 entire system. The assets will provide grid services as the first priority and participate in wholesale markets the remainder of the time. As with all value-stacking projects, and further discussed in the Dispatch section below, optimization and coordination across stakeholders will be key to the success of the Project.

Dispatch

The Project seeks to maximize the value of battery storage through a multi-use model which shares the benefits and costs of energy storage assets across multiple stakeholders. Strong forecasting, performance modeling and communications are needed to execute this model successfully. The Project leverages Tesla's expertise in integrated solar and storage operations including their proprietary *GridLogic* software platform which will be used to manage the assets.

As the primary value driver for the utility is distribution system support, O&R will communicate forecasted constraints to Tesla as identified in the course of regular operations. Tesla will use their existing program to forecast the optimal dispatch of the assets across three competing value streams: demand charge reduction (BTM only), utility grid services, and wholesale market participation. Tesla will provide O&R with opportunity cost curves for each value stream in order to assist the Company with making dispatch decisions, so as to deliver Project benefit for all stakeholders. As compensation for providing this service, O&R will receive a nominal fee from Tesla for the role of scheduling coordinator of Tesla assets into wholesale markets.

Phase 2 of the Project will first focus on achieving optimal availability of the battery for all users. Once this has been accomplished, the Project will move into Phase 3 which will seek to further optimize the dispatch to maximize Project revenues.

Wholesale Market Revenue Sharing

Ninety percent of the revenues from wholesale market participation will accrue to O&R and will be used to offset the cost of the Project. The remaining ten percent will accrue to Tesla for their role providing the optimizing engine. The following *Anticipated Future Market Model* section describes intended changes to this arrangement.

Future Market Model

The Project is designed to address current barriers to energy storage deployment in New York. The Company anticipates using the operational lessons from the Project to evolve the business model to a sustainable future state. As this is the first true multiple-use case energy storage model in New York, revenues and performance has not yet been demonstrated. The demonstration project will provide actionable data on the value energy storage can generate for utilities, customers and third-party partners by providing T&D deferral, demand charge reduction and wholesale market services simultaneously through single or aggregation of energy storage assets.

O&R anticipates leveraging this model as a part of a portfolio of solutions used in future Non-Wire Alternative opportunities wherein O&R issues a solicitation for T&D investment deferral. Developers will use this multi-use model to reduce the cost of energy storage solutions that can economically compete with other solutions while providing the unique operational attributes of energy storage.

The Project will be used to advance understanding of energy storage participation in NYISO markets and to quantify the potential for a multi-use case energy storage assets to generate cost-offsetting revenues in the wholesale markets. The successful use of the assets for system benefit in the Project will provide needed operational evidence to quantify the value of these assets. This operational learning, in addition to market participation, will reduce uncertainty and risk. In the Future Market Model, the developer will retain the majority of wholesale revenues and price capacity and energy products to utility and customers accordingly, while accounting for availability of assets for each user.

Energy storage can earn revenues by providing energy, capacity, and ancillary services (including frequency regulation and reserves) to wholesale markets. The value of these services may vary yearly, hourly, and by the minute. Based on today's prices, frequency regulation is an attractive market product for many hours of the year. If prices in the frequency regulation market were to decline, the energy storage system could serve other markets (e.g. reserves and energy) for a greater number of hours of the year in order to maximize revenues. Thus, energy storage's ability to earn revenues from different market products can act as a financial hedge against future prices and revenues from one specific market product.

To provide BTM customers more certainty in their expected savings, and give them confidence to participate in the Project, the customer will receive "make whole" payments for the life of the system (i.e., ten years), in cases where use of the battery for other services compromises savings for demand charge reduction. These make whole payments will only be a temporary measure reinforced as part of this demonstration project. These payments are not intended to be part of any future project deployed in the O&R service territory that follows similar multi-use business models. The collaboration of Tesla and O&R will help the Project identify customers whose load profile will allow for participation in multi-use model, with minimal risk of make whole payment. Make whole payments from O&R beyond the three-year demonstration period are expected to be minimal due to experience gained during the demonstration term.

Demonstrating Value Stream Stacking

The operational flexibility of energy storage is at the core of its value proposition. A key source of energy storage's flexibility is its ability to be located at the edge of the distribution system and directly at customers' sites. A recent report authored by the Rocky Mountain Institute[3] identified 13 services that batteries are technically capable of delivering. However, current installations limit the business model to a single value stream, thereby relegating the asset to 5-50% utilization over its useful life.

As a result of the Project, the impact of multiple applications on battery life and performance versus the additional benefit streams will become better understood. Battery degradation and performance will be accounted for in system sizing and maintenance so that adequate capacity is available for participation in all value stream markets. In the event of earlier than expected battery degradation, Tesla will be responsible for providing remedies which might include repair,

[3] Rocky Mountain Institute, "The Economics of Battery Energy Storage ", https://www.rmi.org/wp-content/uploads/2017/03/RMI-TheEconomicsOfBatteryEnergyStorage-FullReport-FINAL.pdf

replacement or monetary compensation for the damage (covered as part of Tesla's warranty program)

The ability to stack these value streams successfully is critical to making energy storage cost-effective. Demonstrations of the potential for multiple value streams have been limited to date, with resources only providing wholesale, distribution or host customer services. When energy storage is deployed for multiple value streams, the amount of value and revenue generated on a per unit basis increases to capture previously idle storage capacity for productive use. This additional revenue means that multi-use applications of energy storage can be economically viable in locations where single-use applications are not.

Figures 1 and 2 below illustrate the difference between single use of a storage system and multi-use optimization. In Figure 1, the battery is only used for the single use of customer demand charge management and the battery remains idle for the majority of the day. Figure 2 demonstrates multi-use optimization, where the battery is used for customer demand charge management, plus wholesale and distribution services. Under multi-use optimization, the amount of customer demand charge reduction is less, but the battery achieves greater utilization with a corresponding increase in the total value generated across all applications.

Figure 1: Battery Operation with Single Use: Demand charge management only. (SOC, or "state of charge," is the energy available in the battery.)

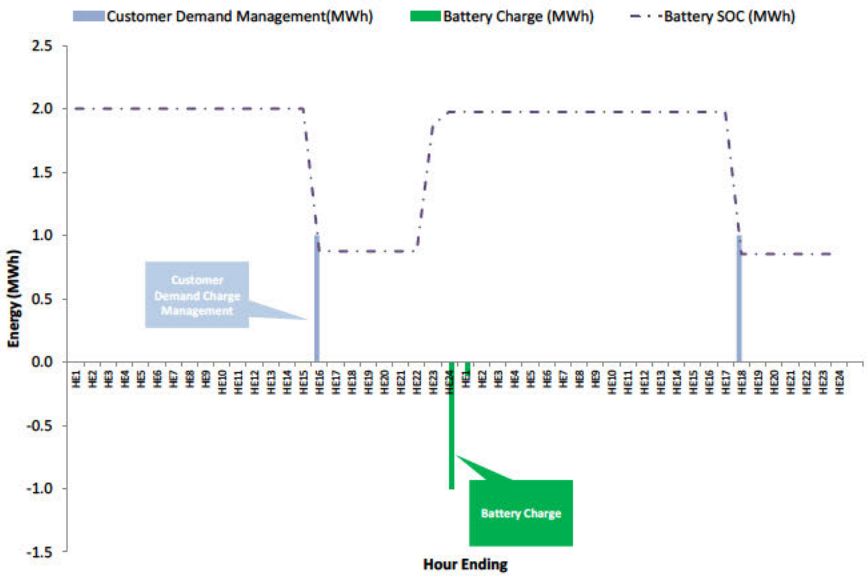
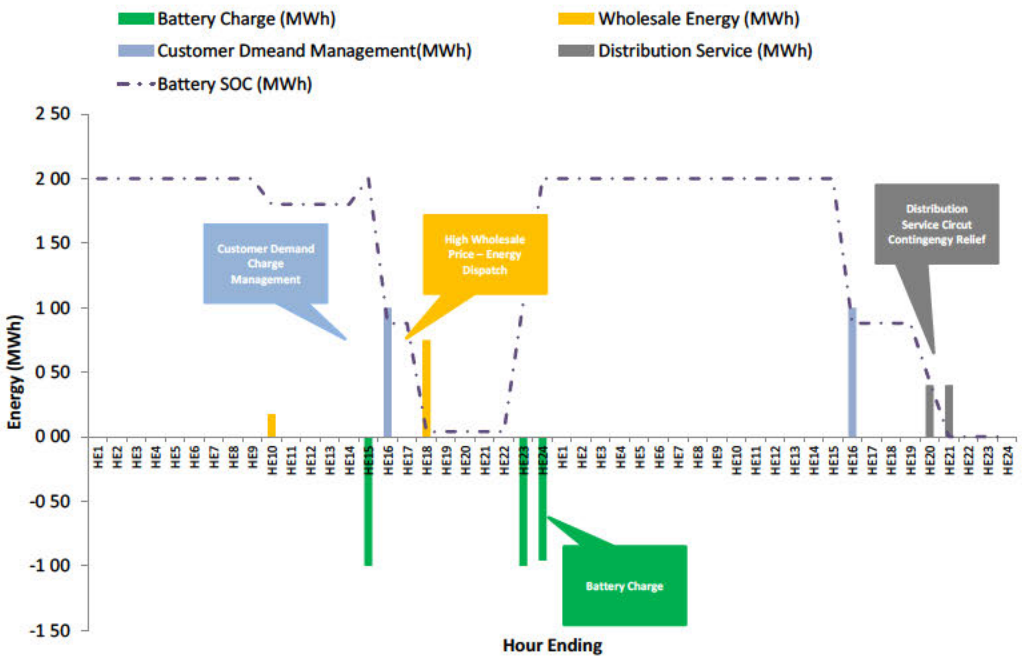


Figure 2: Battery Operation with Multi-Use Optimization: Demand charge management, wholesale energy, and distribution services.



Realizing the economic potential of stacking services across the electric grid is only possible if the full range of entities that demand those services can access them.

Strategic Placement for Maximum Benefit

The key value driver of energy storage for O&R is the ability to defer traditional T&D investments to the economic benefit of customers while maintaining the system's reliability. Traditional T&D upgrades typically require an overbuild of capacity relative to network need, driven by the size of available equipment. Storage provides utilities with the time to assess whether load trends will continue and design an appropriately sized solution. Even in scenarios where the traditional upgrade is eventually needed, the deferral can provide an economic benefit to customers.

In order to capture the T&D value of storage and defer infrastructure investment, the storage must be strategically located in an area of significant need. The Company will identify existing areas of need on the grid and communicate these locations to Tesla for both the BTM and Remote Solar + Storage segments. Tesla will use this information to identify customers or locations for each of the portfolios. This process will provide the assets with the greatest potential value to the grid and closely mirrors the Anticipated Future Market Model participation for NWA opportunities.

Deployment of Solar + Storage for Additional Benefits

There are many advantages to pairing ESS with solar photovoltaic systems. Energy storage has the ability to increase the value of the solar energy, by allowing solar DG to become dispatchable and shifting energy output to times of greatest need. Conversely, relying on solar, the battery needs to be dispatched less if generation occurs during times of peak reduction needs. Energy storage can also be used to mitigate technical barriers to interconnection and integration of solar. In addition, there are often operational efficiency and cost savings of deploying solar and energy storage assets together. Storage co-located with remote solar deployments will benefit from lower overall build costs due to shared overhead and acquisition costs (i.e., relatively fixed costs include mobilizing

labor forces, shared inverter, geologic site preparation, permitting, environmental studies, and new service connections). Energy storage and solar projects face similar fixed costs, and thus involve higher per unit build costs compared to stand alone projects.

Remote solar projects also will benefit from cost reductions via the ITC. Despite these advantages of pairing solar and energy storage, solar systems are often deployed without energy storage because the business models and processes needed to offset the costs of energy storage and enable these benefits do not yet exist.

The Project will facilitate a path for the deployment of storage with solar, by demonstrating a viable business model for the deployment of energy storage at remote solar sites.

Performance Data to Scale

As documented in the Rocky Mountain Institute report, there is great potential for stacked value of storage, but the majority of business models under which energy storage is deployed today underutilize the asset. One of the barriers to stacked value storage deployment is the lack of performance data available for projects employing these models. The Project will provide many useful operational lessons for third-parties, utilities and BTM customers. In addition, it will provide capital markets with information needed to gain comfort with the risks and rewards of a multi-use model for future project financing opportunities. The combination of operational performance and realizable revenue data will further bolster the energy storage market in New York.

The Project will also provide O&R with performance and operations-based data that will help identify incentives for batteries to capture value from multiple revenue streams and can further aid in the deployment of energy storage.

2.3 HYPOTHESIS BEING TESTED

The Project will test the hypothesis that batteries can provide a range of services across multiple applications by maximizing energy storage utilization. It will develop and test a business model that allows for sharing of costs and benefits across multiple stakeholders (e.g., grid benefits for utilities and reduced demand charges for customers). The Project's goal is to demonstrate a viable business model that allows energy storage to provide greater value at lower cost than is possible under current business models. This will lead to accelerated deployment of energy storage in the O&R service territory.

To test the hypothesis, the Project will demonstrate the following:

Hypothesis Being Tested	Validation Criteria
Aggregated storage and solar + storage can provide value to multiple stakeholders (NYISO – wholesale market, Utility – T&D cost deferral and Customer – Demand charge reduction).	• O&R will analyze the degree to which the asset is available to meet the needs of all stakeholders, and whether the multiple value streams sufficiently reduce the cost of the system. • O&R and Tesla will identify any availability constraints that may arise due to the dispatch of the battery ESS to benefit all

	stakeholders.
Utilities can leverage aggregated BTM and solar + storage systems to provide T&D benefits.	• Tesla and O&R will co-ordinate 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) • Tesla will select customers whose peak load time-frame is coincident with O&R's distribution system peak. Tesla will analyze the customers' load shape usage and compare it against O&Rs load shape to determine the best fit which will help O&R to achieve the maximum peak reduction possible in the distribution system. O&R will verify the analysis from Tesla so that C&I customer's load shape is coincident that of O&R's T&D system. • O&R will coordinate with Tesla to operate and dispatch the storage units for grid benefits purposes and identify any operational constraints.
Aggregated storage and solar + storage will be able to earn revenues in the NYISO wholesale market.	• O&R and Tesla will quantify the earning potential of the storage from each of the wholesale market products. • O&R and Tesla will then analyze how these earnings will help to offset the overall cost of the battery storage services for future iterations of this business model. • Energy storage's ability to earn revenues from different NYISO market products can act as a financial hedge against future prices and revenues from one specific market product.
Customers benefit from participating in a multi-user model to reduce their demand charge with a shared storage asset.	• Customers can leverage the storage system to reduce their demand charge by reducing their peak load. • O&R and Tesla will analyze the customers' savings stemming from demand reduction to understand how they affect the cost sharing and benefits of the battery storage system compared with demand charge reduction provided by a standalone battery.

2.4 LINKAGES TO DEMONSTRATION PRINCIPLES

Principle	Proposal
Partnership between utility and third-party service provider; goal of third-party capital contribution	The Project focuses on the partnership and coordination between O&R and Tesla. Tesla will invest in and retain ownership of the storage assets deployed as part of the Project. Host customers will contribute resources to the Project through payments for demand reduction service. The Project partnership will establish reference model relationship among the utility, aggregators, and customers that reflects an innovative flow of capital and services.
Utility identify problems on the grid and market participants should respond with solutions	O&R will identify areas where constraints or problem situations exist on the grid. Tesla will identify sites and host customers located in those target areas. Data sharing between O&R and Tesla enables the market participant to locate and design batteries to meet these grid needs.
Clear delineation of how generated economic value is divided among the customer, utility, and third-party service provider	Economic costs, risks, and value are divided among all market participants in the Project, host customers and remote solar customers, O&R, and Tesla. Host customers share the expense, and value of the energy storage asset with O&R. These customers can offset the service through bill savings without the need for large upfront capital, due to Tesla's financing. O&R produces value using the energy storage assets to provide distribution network benefits (avoiding or deferring upgrades) and bulk system value by selling wholesale products into NYISO's market. Tesla is enhancing the flexibility and value of its energy storage assets provided to customers, enhancing the value of its remote solar projects, earning revenue for deployment, and learning from these innovative approaches.
Market for grid services should be competitive	The services provided are designed to clear the competitive wholesale market, if market rules permit. In the absence of actual participation, simulated competitive market participation will be part of all scenarios tested. In addition, all customer acquisition and remote solar sites obtained will be competitive with other third-party developers. In a competitive marketplace, aggregators will be incented to develop optimal algorithms for their resources in order to offer competitive services to utilities.
Propose rules that will help develop subsequently competitive markets; establish regulatory proposals to promote safety, reliability and consumer protection.	The Project will demonstrate the technical capabilities and constraints that energy storage will face as a resource bidding into the wholesale market. Lessons learned from the Project will guide the development of effective wholesale market rules to allow for DER participation. These lessons will also enable Distribution System Platform Providers ("DSP") to establish open and accessible platforms for numerous DER types. Project results will demonstrate the reliability of the resource and confirm compliance with all safety and consumer protection requirements.
Inform pricing and rate design modifications and include opportunities for third parties to demonstrate how	By including BTM assets at customer sites, O&R will observe dispatch constraints set to guarantee customer demand charge reductions based on the customer's rate. Lessons learned from

various rate design can be used to benefit consumers, encourage customer participation, and achieve REV's efficiency and bill management objectives.	this portion of the Project may help inform O&R in the development of pricing for demand charge tariffs that will inherently encourage energy storage deployment with multi-use applications. Data generated from the Project can be used to inform the value of DERs, which will influence pricing and rate design activities.
Utility and third-party service provider(s) should consider deploying in their demonstrations advanced distribution systems, including two-way communications, real time operation of dynamic load, and other system technologies that support awareness, flexibility, efficiency and cost-effectiveness.	All distributed energy storage assets for the Project will be equipped with revenue grade metering, advanced two-way communication devices (*GridLogic*), that allow for real-time remote monitoring and control of assets individually or in aggregate.
Utilities should explore opportunities in their demonstrations to work with and include various residential, commercial, institutional and industrial customers.	The Project will explore the interaction between C&I customers and O&R related to control of a shared energy storage asset. Residential customers can subscribe to purchase energy credits from the remote solar projects, and receive the benefits of savings on their electric bills and supporting renewable energy. When storage systems are used to increase hosting capacity, more remote solar projects can be deployed, and more customers will be able to subscribe to purchase remote solar credits.

3 MARKET ATTRACTIVENESS

3.1 UNIQUE VALUE PROPOSITION

Participating Customer (Host)

For batteries deployed BTM, the customer will experience reduction in demand charges. Tesla will monitor customer consumption and use its proprietary battery control technology *GridLogic* to manage the battery system to shave peak load on the customer site, reducing peak consumption at the point of common coupling. The reduction of peak consumption reduces demand charges for the customer, driving customer savings. Tesla will also pay attention to the customer's load shape. It is important to identify and leverage customers whose load peaks around the same time as O&R's T&D system, so that any reduction in customers load will also enable O&R to realize T&D grid benefits.

From these peak demand reduction services, the customer pays the Project a service payment which is less than its bill savings. Under this new multi-use business model, the Project can offer the C&I customer a reduced cost for demand reduction services, because the battery is also used to generate revenue and savings from other high value applications. A lower cost for the demand charge reduction product will increase the market size for customers who can economically deploy energy storage.

Third-Party Partner

Tesla will be the developer and owner of the battery systems for the Project. In this role, Tesla will develop, design, install, operate, and maintain the systems and provide energy storage services on a contractual basis to BTM customers and O&R. Tesla will have separate contracts with the BTM customers and with O&R. Tesla anticipates designing optimal dispatch schemes to maximize the value of the batteries across multiple use cases, including participation in NYISO programs for which Tesla will receive a portion of associated net revenues as a performance payment to align battery optimization incentives.

Tesla has a strong track record of deploying storage systems for grid services and is well positioned to build on previous experiences and business models in this demonstration. However, this Project will be the first to demonstrate three use cases (demand charge reduction, T&D deferral, and wholesale market participation), with explicit participation in the NYISO market and direct monetization of benefits.
Tesla is pursuing development of multiple storage projects in New York, and has collaborated with the New York Energy Research and Development Authority ("NYSERDA") to identify and address barriers to storage deployments. Tesla's existing customer relationships and battery deployment experiences will provide significant value and risk reduction to the Project.

Utility
In this demonstration, O&R will generate valuable experience with the development and testing of DSP capabilities and the integration of ESSs into utility operations. This experience will support O&R's efforts to modernize the power system, enable higher penetrations of distributed renewable generation, and leverage DERs to provide grid services, including the deferral of expensive demand-related T&D upgrades.

O&R, as the distribution system operator, will test the multi-use business model and capability of battery storage with Tesla. O&R has expertise and a strong background in deploying critical infrastructure, reliably providing electricity to its customers. O&R will engage in a contract with Tesla for energy services from the battery systems, which will make the batteries available for a variety of distribution and wholesale services. O&R will also be able to test how reliably these assets can be for customers and perhaps lower the cost of battery solutions through Platform Service Revenues ("PSRs").

O&R will provide NYISO Scheduling Coordinator services as a value-added service. This service and revenue stream will establish a foundation for a broader set of wholesale and distribution market services that O&R will provide as it develops capabilities and learnings as a DSP Provider. O&R will receive an annual payment for serving as Scheduling Coordinator for the Tesla portfolio. O&R may also earn additional revenue for providing other value added services, such as providing customer acquisition support.

3.2 CUSTOMER SEGMENTATION

The Project focuses on two segments: BTM customers on demand charge tariffs and remote solar project developers. For both segments, O&R will work with Tesla to identify Project sites with the greatest locational value to the distribution system and develop selection criteria for potential customers.

3.3 CHANNELS

Tesla will use its internal project development and sales teams to identify host customers for BTM batteries and sites for batteries deployed with remote solar systems. O&R will collaborate with Tesla to support customer acquisition and to identify areas where battery deployments may have greater locational value.

3.4 ABILITY TO SCALE

The Project is designed to address a large portion of C&I customers as well as remote solar participants. The benefits and revenue streams under the Project model are not unique to O&R's service territory because wholesale market participation and customer demand charge reduction are accessible across New York and the country. Consequently, the proposed business model can be readily deployed both within New York and any other state which allows market participation for storage. The Project model will seek to grow the market for DERs for the customer benefit.

The business model is applicable for any Utility Company.
The Project is designed to address a large portion of New York C&I customers as well as remote solar participants. Similarly, many of the benefits to O&R are not unique to O&R's service territory, because NYISO wholesale market access can be obtained across New York. Consequently, the proposed business model can be readily deployed across New York. The Project model will seek to grow the market for distributed resources for the customer benefit.

Declining cost curves will improve the economics.
Looking forward, battery costs are expected to continue to decline, which will further increase net savings for customers and the market size for economically viable demand charge reduction. This will also present increased opportunities for PSRs as additional storage systems are deployed under similar business models.

The business model is vendor agnostic.
Once proven, this business model could be used by any number of vendors, speeding market growth and reducing costs through competition. Third-party vendors would then compete on a set of additional factors, including cost, control capabilities, optimization strategies, and leveraging customer siting.

4 DEMONSTRATION PLAN

4.1 METRICS FOR SUCCESS

Phase 1 Customer Adoption and Site Selection Metrics
In Phase 1, success will be measured by Tesla's ability to acquire 4MW/8MWh of energy storage capacity among remote solar and host customer sites within one year of the Project's approval by the Commission. During the customer adoption phase, Tesla will provide O&R with bi-weekly updates on key metrics relating to customer acquisition, adoption, contract signing, installation, and commissioning, as detailed in Table 1. Recognizing the importance of customer acquisition, O&R and Tesla will work closely to expedite the customer adoption process.

Table 1: Key Metrics for Phase 1

Performance Characteristics	Definition/Methodology
Increase in C&I customer value	Percentage of customer leads with >20% improvement in customer economics ($ per kW-month) from program participation.
Customer interest in multi-user model	Compare customer acquisition rate for Project model with customer acquisition rate for traditional BTM model
Customer Value: ISBM vs. stand-alone	Decrease in cost of demand charge reduction services for C&I customers under the Project model compared with cost of service under traditional stand-alone BTM model
Installation Value: Community solar	Percentage reduction in installation costs (in $ per kW) versus comparable stand-alone storage installations.
Market Size: Behind the Meter	Percent of customers who can economically participate in Project model that could not have under traditional stand-alone BTM model

Phase 2 System and Process Integration Metrics – Technical Performance of Asset Response and Flexibility

The metrics for Phase 2 will demonstrate technical capability of the assets, both individually and in aggregate, to provide visibility, dynamic control, and reliable response to the Company for identified use cases for a designated operational period.

This phase will test if distributed energy storage assets can respond to market or operational dispatch signals in near-real-time to provide a suite of distribution grid services that include energy, ramping, dynamic capacity, and reactive power support, depending on the needs of the local or bulk grid at a given time. The dispatch will simulate the way a future DSP would operate or trigger the dispatch of storage assets throughout its network.

The results will be tracked and measured according to a variety of metrics listed in Table 2 below for both the host customer and remote solar plus storage assets.

Table 2: Key Metrics for Phase 2

Performance Characteristics	Definition/Methodology
Control Responsiveness	System control responds to market signals from the DSP platform, including price and operational signals. Analyze if data is transmitted real time

	and if there are any latency in transmitting data. Understand if latency in data transmittal causes reliability concern.
Availability for Multi-Use Operations	Measure the % availability for the energy storage and the solar plus energy storage system when required by the utility to use for T&D benefits Percent availability of how often utility wanted to dispatch asset but found it economically lucrative to dispatch the asset for customer or wholesale market.
Demand Charge Reduction	Percent co-incidence between utility need and C&I customers demand charge reduction. Measure and quantify demand charge reduction achieved under multi-user model vs single user model. Measure the % change in demand reduction.
Resource Reliability	Accuracy of grid service output relative to dispatch (e.g., percentage of requested kW capacity; percentage of targeted voltage band; measured power factor).
Impact of solar charging constraint	Financial impact and impact on availability of charging from solar vs. grid to capture ITC.

Phase 3 Market Participation Metrics – Stacking value streams for full market based earnings

Phase 3 metrics 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 as expected. Viability will be determined by evaluating if the multiple services result in a positive net revenue stream.

Table 3: Key Metrics for Phase 3

Performance Characteristics	Definition/Methodology
Customer Satisfaction: BTM	Satisfaction survey of C&I customers to attain customer Net Promoter Score. Demonstrate no tangible impact to customer operations resulting from shared ESS dispatch, i.e., for a BTM customer, understand how dispatch of ESS for T&D or NYISO affect their demand charge reduction. Percent of days each month demand charge reduction targets were not achieved

Performance Characteristics	Definition/Methodology
Utility Value	Percent of avoided costs on the local distribution network compared with forecasted, achieved by actively dispatching energy storage system to defer projects that would otherwise need capital investment.
Wholesale Market Value	Percent of actual revenues realized vs. forecast from capacity, energy and ancillary services, by economically bidding energy storage system in NYISO markets.
Enhanced revenue stream (BTM)	Quantify BTM customers net demand charge savings Quantify additional revenue/savings resulting from shared storage usage.

Maximizing the value of customer-sited BTM batteries and remote solar resources through multi-use applications including grid services will result in a larger market opportunity for energy storage via third-party participation. If it is proven that BTM and remote solar co-located energy storage systems can be reliably dispatched to provide grid services, then more energy storage will be deployed by third-parties due to the increased revenue potential from storage. Customer costs will be reduced and utility investors will benefit due to the ability of the DSP to monetize savings from avoided or deferred infrastructure upgrades due to optimal storage dispatch and aggregated distributed assets. Energy storage assets might help to lower interconnection costs and increase distributed generation hosting capacity. Wholesale market rules can be updated to allow for aggregated distributed energy storage participation using the Project's results and data.

4.2 TIMELINES, MILESTONES, AND DATA COLLECTION

The Project will cover a three-year period with a formal reporting requirement. This will include the initial contract signing, customer and site acquisition, installation, commissioning, system integration, testing, and market participation. The Project will file quarterly reports to monitor progress and benefits realization.

Phase 1 of the Project is expected to take between 10 to 12 months. Activities in Phase 1 will include customer engagement, C&I customer acquisition, engineering and construction and aggregation control demonstrations.

Phase 2 of the Project is expected to take anywhere from 8 to 10 months and can start 8 months after the initiation of Phase 1. Activities in Phase 2 will include integrating the DER system with O&R's distribution system and gathering operational data to understand the effectiveness of the DER system.

Phase 3 of the Project will aim to measure market participation and is expected to take between 24 to 26 months.

Phase	Key Elements	Milestones
Phase 1 – Customer Acquisition (10–12 months)	Customer acquisition, negotiate and finalize contract, engineer and construct project	1. Site Selection for Community Distributed Generation 2. Acquire and engage BTM C&I customers 3. Draft contract for customers 4. Design and engineering 5. Installation and commissioning
Phase 2 – Operational Control/Dispatch (8-10 months)	Operational Control and Dispatch of the storage systems	1. Integrate ESS with O&R's distribution and communications system 2. Gather operational data to analyze effectiveness of DER 3. Dispatch ESS for various stakeholder benefits 4. Deploy and set control parameters for *GridLogic* dispatch system
Phase 3 – Wholesale Market Participation (20-24 months)	Participate in NYISO wholesale market (energy, capacity, ancillary services)	1. Assess NYISO market product potential 2. Demonstrate earnings from various NYISO markets 3. Demonstrate seamless integration with NYISO system

Data Collection

Tables 4 and 5 below contain the key categories of data necessary for testing the demonstration hypotheses, and methods of measurement. Data collected will be shared between Tesla and O&R.

Table 4: Data for Customer /Community Benefits

Application	Data Requirement	Measurement
Customer Peak Demand Management	Customer load and battery system charge/discharge, interval data	Tesla revenue grade metering
Shared Fixed Costs	Installation and interconnection costs	Tesla operational data
Customer Satisfaction	Net promoter score	Customer surveys

Table 5: Data for Utility Benefits

Application	Data Requirement	Measurement
Reduced Fixed Costs	Installation and interconnection	Tesla operational data

	costs	
Wholesale Market Participation including simulations when applicable.	Information on NYISO market participation and/or simulation ranging from bidding, scheduling, settlements and outages	Tesla metering (record measurements) and Scheduling Coordinator records (record data).
T&D Deferral	Battery operational information including real power and reactive power delivery, control responsiveness, lag Coincidence with utility need	Tesla revenue grade metering
Grid Resiliency/Power Quality	Utility system operational information that may include load, voltage, and other parameters	Utility metering
Increased hosting capacity	Additional hosting capacity or reduced interconnection cost enabled through battery operation	Interconnection study, solar data

4.3 PARTICIPATION

4.4 Target Population

4.4.1 BTM C&I Customers

An ideal customer to host a storage installation for this demonstration would 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).
- The customer is located on a circuit with highly loaded distribution equipment that may need to be upgraded or replaced within the lifetime of the Project.

4.4.2 Remote Solar + Storage Sites

Remote solar and energy storage installations could be co-located with Tesla remote solar projects otherwise in development. O&R and Tesla will target in-development projects that will maximize Project value to O&R and provide the most opportunity for demonstrating stacked value streams.

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.

4.5 Third-party Partner

Tesla will provide full, end-to-end energy storage services to O&R through an energy storage services contract. These services will include developing, designing, installing, operating, and maintaining the storage systems and collaborating with O&R to enable the use of the systems for multiple applications.

Dispatch responsibility for the battery systems will be coordinated between Tesla and O&R in order to realize benefits for both the customer and the utility. Careful design of operational

rules, constraints, and practices will be developed in advance of using the batteries in grid operation. Tesla intends to employ its in-house optimization expertise to design optimal dispatching schemes in partnership with O&R through its existing and proven platform, *GridLogic*.

4.6 Utility Resources and Capabilities

O&R will provide project management support to the Project. In addition, O&R expects to require internal resources to support due diligence and implementation in the following areas:

- Customer identification and outreach;
- Establishment of NYISO Scheduling Coordinator capabilities;
- Forecasting of T&D system needs;
- Integration of storage assets into operations and planning functions;
- Customer satisfaction surveys; and
- Legal and technical research related to NYISO market participation.

4.7 CUSTOMER OUTREACH

4.7.1 Outreach to Targeted Communities

O&R will work with Tesla to identify candidate customers that are suited for the demand charge management services (BTM only), and which are located in areas of the distribution system with expected T&D system needs.

As a first step, O&R will identify areas that have the potential for T&D system needs over the next ten years, corresponding to the asset life for the battery systems. This may include areas beyond those that were included in O&R's Initial Distribution System Implementation Plan ("DSIP") filing,[4] and the ones mentioned in O&R's Non-Wires Alternatives Identification and Sourcing Process and Notification Practices filing,[5] which was focused on O&Rs need for over five years. O&R will be working with Tesla to identify customers in these NWA and LSRV areas, since these load areas have already been identified as areas with potential T&D deferral opportunities.

Tesla will then lead the effort to identify and acquire customers in those areas for participation in the Project. Tesla will rely on its existing commercial storage sales team, which has successfully acquired customers for dozens of storage projects around the country. O&R may support Tesla's customer acquisition activities, which may include helping to identify customers with load profiles that are well suited to demand charge management via energy storage. Tesla and O&R will work collaboratively to take all necessary steps to protect customer privacy. O&R will not be sharing any

[4] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7bB64DECD2-7866-49CD-8FF5-03BE7699345D%7d

[5] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={F33A02A0-0A2A-47CC-9EA5-E00EC0B600C8}

customer information with Tesla, unless the customer signs a letter of authorization for O&R to release their data to Tesla.

Approximately eight customer sites are expected to participate in the Project. Each customer will be presented with a detailed contract that will include the risks and benefits associated with its participation and will be encouraged to reach out to Tesla. O&R will facilitate obtaining any additional information. Outreach to local community members in proximity to Project sites will be addressed through local project approval processes, which may include public hearings, site plan review/approval, and/or applicable local permitting. O&R and Tesla will also coordinate with local fire departments and emergency services to provide required safety information and education about battery systems. Tesla and O&R will work collaboratively to educate participating customers regarding additional benefits from inclusion of a battery.

4.7.2 Motivating Customers/Communities

A primary source of motivation will be expected utility bill savings for the BTM C&I customers from demand charge management. The business model used in this demonstration will provide guaranteed cost reductions of demand charge services to participating C&I customers, and will allow many customers to optimize their demand charge management services.

In addition, customers will be educated about the long-term benefits of this business model, including the potential for storage to reduce electric system costs and support integration of renewable generation.

4.8 CONDITIONS AND BARRIERS

4.8.1 Market Rules and Standards

In the Project, batteries located at BTM customer sites and remote solar sites may also participate in NYISO markets. NYISO markets were initially established primarily to support participation by large centralized generation connected to the transmission system. While the NYISO has taken steps to allow distributed resources to play a larger role in NYISO markets, there are still potential barriers that may prevent these projects from fully participating in NYISO markets, as discussed in Section 2.1. O&R will work with NYISO to address barriers to increased cost and project timeliness by facilitating discussion with NYISO and various stakeholders. O&R plans to participate in the NYISO pilot project to inform the NYISO in developing rules and standards for BTM and FTM storage assets participating in wholesale markets. In the implementation plan, O&R and Tesla will develop mitigations to any identified risks that may affect project cost and timeliness.

O&R and Tesla will work together with the NYISO to identify the subset of BTM storage projects that could fit the Behind-the-Meter Net Generation Resource Program criteria, or to seek modification to the program criteria to allow a broader set of BTM resources to participate. NYISO contends that the definition of BTM generation can be limiting and intends to develop additional software, rules, and procedures to enable market integration for all distributed energy resources and to align its wholesale markets with the NY PSC REV proceeding. The timeframe for these changes may not be entirely coincident with Project deployment and may cause delays in accessing NYISO market revenue for the BTM C&I projects. In the case of barriers or delays to full market participation, the storage assets will be used to demonstrate similar values and services through

simulated market participation and/or participation in NYISO and O&R demand response programs.

For storage assets located at remote solar locations, there are fewer barriers to participation in NYISO markets. Since these assets are not located behind a customer meter, storage assets located at remote solar sites are expected to have direct access to NYISO markets. The Project team will work with NYISO to find opportunities to streamline and coordinate NYISO and O&R rules for distribution-connected storage that participates in NYISO markets. Although there is precedent for allowing storage into wholesale markets, there are remaining questions about dual participation and buyer-side mitigation.

4.8.2 Consumer Protections

The focus will be on BTM customers that are generally more sophisticated about their energy consumption and as a result could more easily quantify benefits and risks associated with participation in the Project.

O&R and Tesla will abide by all applicable consumer protection requirements, including the protection of confidential customer information.

4.8.3 Channel or Market Challenges

Since storage technology and business models are still relatively new, there are many potential challenges related to identifying good candidate sites and obtaining all required permits and approvals. Challenges include availability of customer load data, structural and space requirements, and lengthy approval processes. Tesla has made significant progress in addressing these challenges for storage deployments in New York and around the country. O&R and Tesla will collaborate to address existing and emerging challenges.

5 FINANCIALS

5.1 VALUE STREAMS

The business model structures for both BTM and remote solar +storage sites allow O&R to defer T&D investment and also receive incentives as scheduling coordinator and customer acquisition support service. The project will also participate in the NYISO marketplace, providing additional wholesale revenue incentives to O&R.

Financial Value Streams

Demonstration Period (3 years):

During the first three years of the Project, Orange and Rockland will provide Tesla with a contract payment for the demonstration project, as outlined in Section 5.2 below. Contract payments will be tied to development milestones and may shift in time based upon completion of those milestones. Any Operation and Maintenance ("O&M") costs are included as part of the fixed payment stream from O&R to Tesla.

Other payments to be made by O&R include "make whole" payments discussed in Section 2.2 above, which will be made to customers to account for cases where dispatch of the battery by O&R for services other than demand charge reduction, compromises demand charge savings. These payments are in line with the wholesale revenue sharing arrangement between O&R and Tesla which will continue throughout the demonstration period and the life of the Project.

O&R will receive the following benefits from Tesla as part of the demonstration project:

- Wholesale Revenue Sharing – Revenues earned through participation of the batteries in the NYISO market will be shared between Tesla and O&R:
- Deferred T&D Investment – O&R will leverage the batteries to defer T&D capital infrastructure investments: and
  Scheduling Coordinator – Tesla will pay O&R a fixed fee for providing Scheduling Coordinator and Settlement services.

The shared saving mechanism will allow the Company to earn value for both shareholders and customers by retaining a portion of the net savings realized from utilizing the battery portfolio to earn revenue through wholesale market participation (i.e., energy, ancillary services and capacity services), and defer T&D investments.

Post-Demonstration Period (7 years):
All value streams will continue beyond the three-year demonstration period (with the exception of the Company's initial contract payments made to Tesla), including wholesale market revenue sharing and scheduling coordinator fees. Make whole payments will be continued for customers participating in the demonstration as part of the wholesale revenue sharing arrangement.

Transmission & Distribution Capacity
In addition to wholesale market revenues, energy storage deployed at the distribution level can provide T&D system capacity during peaks or contingency events, either alleviating grid congestion or deferring new investments. A key deliverable of the Project will be to assess the value of the storage to the system, and provide these findings in the quarterly reports to Staff.

Transmission & Distribution Capital Project Deferral
ESS will also be able to provide long term benefit to the utility by deferring capital projects. An electricity grid investment or project can leverage an ESS, to defer or replace the need for specific equipment upgrades, such as T&D lines or transformers, by reducing load at a substation or circuit level. As part of this demonstration project, O&R will be able to assess the value of ESS as it pertains to deferring capital projects.

Wholesale Market Revenues
Deployed ESSs are intended to participate in wholesale markets and generate revenue that offsets utility costs and thereby generates savings for all customers. Each installation will be able to be individually optimized, or as an aggregated portfolio of batteries to minimize load procurement costs and maximize T&D benefit and asset earnings. Wholesale market revenues will be incentivized by participating in NYISO market operations which include daily and hourly financial settlement for energy and ancillary services and monthly settlements for NYISO's Installed Capacity ("ICAP") auction.

Table 6 summarizes the portfolio's estimated wholesale value for the duration of the demonstration period. The Project is expected to be a source of practical experience that will be helpful to understand how NYISO incentives affect the business model.

Table 6: Forecasted Wholesale Values for Storage Portfolio ($000)

Year	1	2	3
Wholesale Energy	$46	$47	$43
Wholesale Ancillary Services	$581	$592	$561
Wholesale ICAP	$146	$149	$129
Total Revenue	$773	$788	$733

Source: Tesla

Scheduling Coordinator

Tesla will pay O&R a fixed fee for providing Scheduling Coordinator and Settlement services. This fee will be comparable to rates that are charged by other entities that provide scheduling coordinator services. In the Anticipated Future Market Model, this fee would instead be a performance-based PSR for successful and efficient dispatch of the third-party assets into wholesale markets

5.2 INVESTMENTS

Tesla will own the storage assets. The cost of installation and financing and overall execution of the Project results in a revenue requirement to deploy and maintain the Project. Typically, this revenue requirement would be contracted to a single off- taker, but in a multi-user model the Project costs will be shared commensurately with the benefits provided by the resource. The Project will exploit fixed costs synergies by sharing costs and tax credits between PV and battery installation fixed costs to reduce the overall cost of the storage portfolio compared to standalone projects. In addition, the Project costs will be recovered from multiple entities, including host customers and O&R.

The total combined projected Project costs provided below include O&R payments to Tesla for portion of usage, O&M costs, and Tesla's internal project management and support for implementations of the Project (total cost of $5.589M) for the demonstration period.

Table 8: Estimated Project costs for Storage Portfolio ($000)

Year	1	2	3
	$1,811	1,888	$1,890

The total cost exceeds the estimated value of infrastructure investment deferral and wholesale market revenue projects, both in aggregate and individually. However, with the reduction of energy storage costs and the optimization of the multi-user model's ability to maximize revenues, the Company anticipates that this business model will provide a cost-competitive model for future NWA opportunities. This model also benefits from revenue diversity to fortify the business model against changing market conditions and risks.

Pricing for the Project

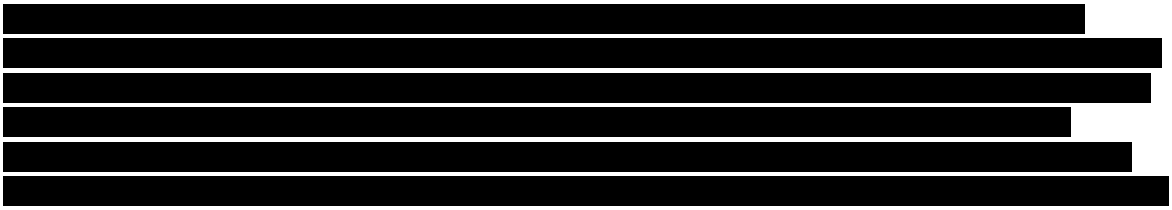
Host customers for behind-the-meter projects will benefit from electric bill savings through demand charge reduction services. Host customers will pay service fees to Tesla over the life of the system for providing demand charge reduction services. This service fee is designed to be less than the total bill reductions that the customer receives from the demand charge management services.

Timing of Investments
Contract development payments to Tesla will be tied to development milestones and may shift in time based upon completion. Development milestone payments will be linked to the individual project sites and a function of the total energy capacity (MWh) of storage deployed at the site. For instance, if a single site has a deployment of 2MWh of storage, 25% of the total milestone payment allocation will be paid when the site is obtained. This way, the payments will be allocated in proportion to the volume of storage deployed.

Third-Party Capital
Tesla will secure third-party financing for the Project. Typically, Tesla would work with a Tax Equity investor to monetize tax benefits such as the ITC. Tesla may also use debt financing to cover additional project costs. Since the Project includes a novel business model, Tesla will work with investors and lenders to establish a financial structure appropriate for the Project. The Project will increase investor knowledge and experience with this business model, thus facilitating the financing of similar projects after the demonstration.

5.3 RETURNS AND COST-EFFECTIVENESS

The Project will generate value, directly and indirectly, through wholesale market revenues, avoided demand charges, and T&D cost savings. It is anticipated that the total benefits realized during the ten-year lifetime of the Project will exceed costs, resulting in a net-positive benefit-cost analysis (in addition to intangible benefits such as project learnings, etc.). In practice, the degree to which the Project will be cost-effective will depend on the co-location of batteries with grid needs, the Project's ability to participate in the wholesale market, and the optimization of the storage systems. Nevertheless, the projected revenue streams, the validation of which is an aim of the Project, continue to be in developmental stages. Although O&R anticipates positive benefits over the life of the Project, it is still yet to be determined how the various benefit streams will be co-optimized. For example, the degree to which the batteries will be dispatched and participate in the wholesale market, meet T&D system needs, reduce customer demand charges all will affect the benefits mix of the Project.



[redacted]

6 REPORTING

O&R will provide quarterly metrics tailored to each phase of implementation in accordance with Commission requirements. See Section 4 for a list of metrics that will be tracked, analyzed, and reported upon throughout the three project phases.

7 CONCLUSION

7.1 POST DEMONSTRATION BENEFITS

7.1.0 Qualitative

Through the deployment and operation of energy storage for multi-use applications, O&R will generate operational data and lessons learned that will inform DSP development, support future integration of storage systems into utility operations, and expand participation in the NYISO markets.

The business model for multi-use energy storage applications has the potential to significantly accelerate the deployment of energy storage in New York. The Project will aid in addressing the underutilization of energy storage and provide insight on the value of energy storage to customers, utilities, and bulk system operators. Under this new business model, multiple entities that can derive value from storage will coordinate investment to deploy storage together. Once deployed, multi-use optimization, systems integration, and operations coordination will all be tested to advance the industry's understanding of these cutting-edge issues and accelerate future deployments of energy storage systems.

Lessons learned from the Project will guide the development of rules and regulatory policies to allow for distributed resource participation. The proposed projects herein will abide by the ultimate rules established in the Case 15-E-0751 ("Value of DER" proceeding) and NYISO DER integration roadmap.

Reduction of Commercial Risk
A key Project benefit will be the reduction in perceived commercial risk associated with deploying a similar battery business models in the future in New York. Many lenders and customers may be reluctant to participate in a new business model for the first time, even if the anticipated business model is viable and profitable. Demonstrating the successful application of this business model will reduce the level of perceived risk to customers and lenders. The reduction of perceived risk will bring more third-party capital and financing into the market, enabling the business model to scale and improving project benefits through competition.

Remote Solar + Battery Sites
The remote solar market represents an important opportunity to meet the State's goals of achieving 50 percent renewable energy by 2030.
If batteries are deployed along with remote solar projects, the battery can be used to increase hosting capacity (e.g., by charging during times of high solar production) and potentially reduce interconnection costs enabling greater solar penetration.

DSP Provider Learnings and Utility Value Added Services
O&R will gain experience with providing value-added services and receiving commensurate PSRs while serving as the DSP provider. These services will be necessary for utilities to provide to future commercial projects. The experience gained via the Project will be valuable as O&R continues its efforts to fulfill future REV initiatives and opportunities and works to become the DSP provider on a larger scale.

Customer Benefits
In addition to opening up demand charge reduction services to more customers, the Project offers the added benefit of advancing the future energy vision of New York at lower cost to customers due to the unique cost and benefit sharing model. In the future, if the deployment of storage with remote solar can increase hosting capacity and improve overall project economics, more remote solar projects could be deployed, with the resulting customer benefits.

Adoption of New Technology
Energy storage is an emerging technology with limited customer adoption. As a result, there is little familiarity today with the benefits it can provide. It is also one of the most promising DER and customer adoption of storage will be a key enabler of the Commission's REV goals. Through the

Project, 8 MWh of battery technology will be deployed in O&R's territory and applied in a diverse range of applications, furthering the acceptance and familiarity with the technology.

Improved Operational Knowledge of Stacking Value Streams
As an early demonstration of stacking multiple storage value streams, the Project will adopt a conservative approach in optimizing battery operation in order that capacity is available when needed. The operational experience gained in this demonstration will inform how conservative constraints can be relaxed in order to deliver more value from the battery. Relaxing the constraints will improve the economics of the business model and increase benefits for all stakeholders.

Improved Operational Planning
With a business model that combines multiple value streams across the different levels of the power system, DERs are a key element to developing an integrated approach to planning, energy procurement and operations, as well as synergies among third-party service providers and O&R. Operational flexibility and value can be extracted through an integrated planning approach that places DERs as viable solutions to grid needs.

7.1.1 Quantitative

As a result of the Project, O&R will obtain quantifiable data on ability of storage to defer distribution infrastructure investment and realize wholesale market revenues.

O&R will identify any reduction in BTM customers demand charge due to the integration of the ESS. O&R will then compare this cost of the BTM customer to the customer's bill if they were to participate in a single-user model.

The data from the Project will be available to support future energy storage projects. It will be used to demonstrate the capability of these models to provide T&D value, wholesale benefits and customer demand charge management and advance the multi-use model and financing markets.

As this business model is adopted for future storage projects, additional customer and societal benefits are expected. For instance, benefits to system efficiency and hosting capacity can be measured as they evolve and inform future discussions on how storage can improve each of these measures.

7.2 PLANS TO SCALE

O&R will build on lessons learned from the Project to enable and facilitate the broad adoption of this multi-use business model to accelerate storage adoption and produce customer savings and societal benefits.

7.3 ADVANTAGE

The key advantage of the Project is the optimization of ESS operation across multiple stakeholders including customers, utilities, and wholesale market participants in order to maximize the value of battery systems, while maintaining the availability for distribution

operators to access the batteries for critical needs. Such optimization will enable storage to realize its full potential as a grid asset, while reducing the cost of grid storage services, increasing the value of solar and providing significant benefits to participating and other customers. The Project will enable development in O&R's capabilities as a DSP Provider and will support O&R's efforts to use DERs to support the safe, clean, reliable, and affordable operation of the power system.