REV Demonstration Project Outline

Commercial Battery Storage

Dated: January 20, 2017

Table of Contents

1.0 EXECUTIVE SUMMARY

Consolidated Edison Company of New York, Inc. ('Con Edison' or the 'Company') is committed to supporting the Reforming the Energy Vision ('REV') initiative by helping consumers make more informed energy choices; enabling the development of new energy products and services; protecting the environment; and creating new jobs and economic opportunities throughout New York State. This demonstration project ('Project') addresses energy storage technologies, which, as they continue to evolve, increasingly have the potential to support cost-effective solutions for distribution-level grid needs. New business models can enable energy storage assets to be deployed at scale, while appropriately distributing the costs and the benefits between customers, Con Edison, and third-party service providers.

The Project addresses the hypothesis that a new front-of-the-meter ('FTM') business model would support the most beneficial, cost-effective and scalable energy storage services, and better satisfy the interests of all stakeholders, compared to the traditional behind-the-meter ('BTM') model. To promote wide-scale adoption of energy storage, this Project seeks to address the following significant barriers to its deployment.

1) The economics of the BTM model restrict potential market size as customer demand and load profile limit the number of profitable sites. Additionally, very few customers have the detailed knowledge of energy tariffs required to understand the BTM energy storage value proposition. This leads to low customer uptake, increased customer acquisition costs, and limited storage deployment.

2) A mismatch between the economic drivers for BTM energy storage projects and the needs of the wider distribution grid results in smaller project sizes, increased costs on a $/MWh basis, and reduced utilization of energy storage assets for distribution grid peak load management.

3) Although energy storage assets are capable of capturing wholesale market revenues, these revenues are less known than quantifiable demand charge reductions. The current uncertainty regarding wholesale market entry, participation, and probable revenue limits the third-party investment required to economically deploy stacked value battery storage projects.

Con Edison will partner with GI Energy to develop a new FTM energy storage dispatch agreement and financial structure that will:

- Enable a broader array of customers and customer types to derive value from energy storage by compensating participating customers in a clear, simple way, while not affecting their current electric bills. Customers will be offered a lease for their space to site the storage assets – a real estate transaction that does not require an understanding of utility rates or tariffs;

- Align transmission and distribution ('T&D') support needs with energy storage dispatch from FTM customer-sited energy storage;

- Minimize the cost to the utility of deploying energy storage by enabling larger project sizes and offsetting total project costs through 1) lower customer acquisition costs and 2) secondary value streams from the battery;

- Increase available market size by engaging a larger customer pool and allowing for large-scale deployment of energy storage resources, where they are needed, by removing BTM limitations on project siting; and

- Better align the interests of the Company, ratepayers, and third-party service providers by creating a dispatch agreement that allows the Company priority access to the battery during times of peak load on the grid, and allows for wholesale market participation for revenue generation during all other times.

In support of these objectives, the Project will build 4.2 MW/4.4 MWh of FTM battery storage across four customer host sites.

2.0 BUSINESS MODEL OVERVIEW

2.1 PROBLEM/ MARKET OPPORTUNITY

Batteries have the potential to provide significant value to the grid through multiple value streams. Current practice is for customer-sited energy storage to be installed BTM, in which the primary value of batteries is derived from the reduction in customers' demand charges. This model does not maximize the use or value of batteries because:

1) Customers are restricted by BTM economics and tariff knowledge, leading to higher acquisition costs and smaller potential market;
2) The dispatch priority for BTM assets does not consistently align with grid needs; and
3) Wholesale market participation and revenues are uncertain for distribution level batteries, so excess energy capacity for participation in the markets are not built into projects, leaving economy of scale unrealized.

These market failures are inhibiting the wide scale proliferation of battery storage. New business models are needed to advance this essential technology in the marketplace.

Customers Restricted by BTM Economics

BTM energy storage is only financially viable to the limited number of customers able to maximize and monetize the value proposition. The value includes cost savings from demand reductions, backup power, and revenues through potential participation in demand response programs.

An economically feasible BTM battery storage application is only possible for customers with demand-based electricity rates. Likely targets for the deployment of large-scale BTM battery storage, therefore, include large commercial, industrial, and institutional customers.

For those customer classes with demand-based rates, the economics only work for the minority of customers who have a peaky load profile, since BTM energy storage project economics vary significantly based on a customer's electric load profile. For example, a 2MW/1 MWh battery could theoretically reduce a customer's monthly demand charge by 2 MW over total of 30 minutes, yielding approximately $568,800/year. However, other load profiles with a flatter and longer peak may result in only a 200 kW demand charge reduction from the same battery, worth only $56,900/year. Due to the large variation in economic value available for peak shaving battery usage, developers are incentivized to seek out and work with very "peaky" customers, to the exclusion of those with more typical, flatter demand profiles. This scavenger hunt for the perfect load profile tends to increase customer

acquisition costs, forces developers to shoehorn battery projects into locations that may not be ideal, and disqualifies most buildings, including most low-income housing and other sub-metered buildings, from receiving any benefits from battery storage.

Adding to the difficulty and expense of finding the right BTM opportunity, battery companies must educate customers on rates and tariff structures for them to understand and agree to install a system. A clearer customer value proposition would simplify customer engagement.

The drive to locate batteries behind high peaking customer meters deprioritizes other site selection factors such as total system benefit and ease of construction. This eliminates the ability of many customers to install energy storage on their site and limits the total possible market size in Con Edison's territory.

Suboptimal Grid Benefit

BTM energy storage dispatch does not always align with distribution grid peak. While the host site is incentivized to reduce its on-peak demand as measured by the utility meter, the customer's individual peak may not align with the distribution grid peak. In such a case, the distribution system would only receive a negligible benefit for an individual building's peak reduction, while total network peak remains largely unchanged. For instance, a customer may reduce own peak demand at 7 PM, which provides minimal distribution grid benefit if located on a network which peaks from 8-12 PM.

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

Market Uncertainty

To date, very few distribution assets have participated in the New York Independent System Operator ('NYISO') energy, capacity and ancillary services markets. Batteries are particularly unique in that they cannot be classified as solely a generator, load modifier, or load, and the NYISO markets are not currently structured to handle this ambiguity. While the NYISO works towards developing and implementing the Distributed Energy Resource ('DER') Roadmap, the enrollment and potential revenues for battery assets remains uncertain. As dual participation for distribution assets is still largely untested, the actual availability of the batteries for wholesale participation is unknown. Operational data is needed to enhance market participation studies and uncover any conflicts that may arise from multiple dispatch objectives. NYISO participation will enable true value stacking for storage and allow for greater asset utilization.

2.2 SOLUTION

The Project model utilizes a distributed, FTM configuration to circumvent the problems addressed above. As described in the following section, this business model increases the market size for customer-sited solutions, aligns utility need with battery dispatch, and enables larger systems which can capture economies of scale.

The Project will include four project sites, each containing a 1 MW/1 MWh NEC lithium-ion battery system. One site will also include an Urban Electric Power ('UEP') 200 kW/400 kWh zinc manganese dioxide battery system, a non-flammable chemistry which may provide increased flexibility at indoor battery sites where lithium-ion battery chemistries face permitting challenges. The total Project size is 4.2 MW/4.4 MWh of energy storage. The primary dispatch of the system will be for transmission and distribution benefit; the remainder of the time the assets will participate in the wholesale electricity market.

Business Model Overview

The key innovation of the Project model is that it disconnects project economics from host site electricity usage by locating the assets in front of the meter. This configuration eliminates size and dispatch constraints imposed by the BTM model. Instead of receiving a benefit through demand charge and ICAP ('Installed Capacity') tag reduction under the BTM model, the customer will receive a lease payment for housing the assets. This simplifies the value proposition from a complicated demand charge reduction calculation to $/square feet revenues.

Aligning the economic incentive to available space (FTM) instead of demand charge reduction (BTM) increases the market size for customers capable of hosting batteries. The increased market size will allow Con Edison, in coordination with the developer, to select customer sites located in areas of greatest distribution need and to align battery dispatch with distribution grid needs. Additionally, the battery systems can now be sized to the grid need rather than customer need.

Project Model vs. Anticipated Future Market Model

Con Edison and GI Energy would prefer to test a true "storage as a service" model, wherein the Company pays only for the portion of assets needed for grid benefit and the right of first dispatch. However, as the multi-use storage market is still nascent and NYISO participation uncertain, there is not currently a non-utility alternative to finance first of its kind storage projects. For this reason, the cost and revenue sharing arrangement for the Project, as discussed below, will be altered from the desired future state. The Project Model is

intended to provide the operational data and market animation that will reduce the financing barrier and enable the Anticipated Future Market model. All other aspects of the Project's solution, hypotheses and goals are the same for the Anticipated Future Market model. In both models, Con Edison receives priority dispatch for grid support and GI Energy will optimize the battery dispatch in wholesale markets the remainder of the time.

Cost and Revenue Sharing

Anticipated Future Market Model: Con Edison envisions a future where the wholesale market provides a substantial percentage of revenue required to cover battery system and financing costs. This will enable developers to reduce the Company's cost of storage-as-a-service used for transmission and distribution ('T&D') benefit and competitively bid in future Demand Response auctions. By paying only for the portion of the battery used for T&D benefit, the Company will be able to lower cost of service for customers while enabling an increase in battery installations.

Project Model: Third-party financing is not yet attainable under this business structure without utility-backed "make whole" payments, as few lenders are willing to bear the risk of uncertain wholesale market participation and revenues. Therefore, for the Project, Con Edison will pay a larger share of the costs, and receive a larger share of realized wholesale revenues. GI Energy will obtain third-party financing to cover initial project costs. The ongoing costs and third-party investment will be recovered through a quarterly fee from Con Edison to the developer. The quarterly fee will support all project costs, including customer lease payments, operations and maintenance services, operation and dispatch of assets, financer's return on investment, balance of system, and integration costs. These costs will be amortized over the contract term so that the Company provides a consistent payment. In return, Con Edison will receive a majority of the wholesale revenues realized from dispatch. As the market participant, GI Energy will receive a smaller portion of the wholesale revenues to serve as incentive and compensation for continued analysis and optimization of dispatch algorithms which maximize battery system value.

Dispatch

Con Edison will have primary dispatch rights and communicate to GI Energy when the batteries will be needed for grid benefit. During the demonstration period, the Company will use the Project to learn the potential value of storage to replace or defer traditional infrastructure investment. Battery storage represents a non-wire alternative ('NWA') that may, in the long-term, become a common lower-cost option for meeting peak demand, as in the Brooklyn Queens Demand Management ('BQDM') Program case. The operational

experience and information from this Project will inform how best to invest in storage to meet grid expansion needs in the future.

The remainder of the time, GI Energy will dispatch the units into the wholesale markets for additional revenue. These revenue streams may include, but are not limited to, energy arbitrage, capacity, and frequency regulation. The deployment and dispatch of the assets will inform future applications of storage as an alternative to fast response units, such as gas turbines, capable of supporting increasing grid balancing needs as renewable penetration increases. Realization of these revenues is dependent upon NYISO participation, further discussed in Section 4.5

Customer Acquisition and Site Selection

Con Edison will identify priority network areas based on grid needs identified from the Distributed System Implementation Plan ('DSIP'). GI Energy will then identify and engage customers in those areas with available space suitable for siting a battery system. For those customers that agree to participate in a free energy storage evaluation of their site, GI Energy will obtain the following information.

- Value of annual lease income required to host a 1 MW/1MWh system, with the understanding that final site selection will prioritize the lowest lease prices.
- Maximum size of energy storage asset, in MWh, that could be hosted on customer's site, as evaluated by GI Energy's construction team. This will be reported separately for indoor and outdoor locations, as applicable.
- Interval data for previous year (assuming customer has interval meter installed), or volume and demand billing data. This information will be provided by Con Edison with a signed authorization letter from the customer.

With this information, GI Energy will be able to determine the following.

- Range of customers' price thresholds for hosting 1 MW/1 MWh energy storage projects on their sites, aggregated by network area.
- Average maximum size of energy storage asset, in MWh, that could be hosted by customers', broken down by inside and outside location and network areas, for evaluating future project economics.
- Average demand charge and ICAP tag reduction that could have been obtained by customer utilizing BTM battery systems of 100 kWh, 250 kWh, 500 kWh, 1MWh, and 4 MWh capacity for those sites with interval data available.
- Average load reduction that could be obtained during local distribution grid's peak periods by customers utilizing BTM battery systems of 100 kWh, 250 kWh, 500 kWh,

1MWh, and 4 MWh capacity, assuming customer dispatched battery primarily to minimize their own demand charges.

- From this information, Con Edison will select four customers to participate in the Project. Selection will be based primarily on lowest least payment and highest potential T&D benefit.

All other information will be used for testing hypothesis, as measured and reported in quarterly filings (Sections 2.3, 4.1, and 6.0).

2.3 HYPOTHESES BEING TESTED

Key Hypothesis	Validation Criteria
FTM Systems are more easily scalable across Con Edison's territory, can more easily be targeted in constrained network locations, and can be concentrated into larger battery systems per site	During the customer acquisition phase, data will be collected on the suitability of potential customer sites for both FTM and BTM battery systems. Data will be reported on the size of FTM systems that can be feasibly installed at each customer's site, as well as on the size of BTM systems that can be economically installed at the same sites assuming current Con Edison demand charges and current ICAP charges.
FTM systems can provide a greater magnitude of distribution system peak load reduction than equivalently sized BTM systems	During the customer acquisition phase, GI Energy will collect and analyze customer interval data to determine when the customer would choose to discharge a hypothetical BTM battery system in order to minimize demand charges. The resulting load reduction during Con Edison's network peaks will be reported, and compared to a FTM system, which would discharge entirely during Con Edison's network peaks. The amount of reduced revenue to Con Edison from demand charge reductions will be compared to the payments required from Con Edison for a FTM project of this type, and normalized against the load reduction provided by the battery during the local distribution system peak.

Key Hypothesis	Validation Criteria
A 1 MW/ 1MWh battery system can be deployed in such a way as to provide substantial benefits to the grid.	Data will be collected on the battery system's availability on days when local distribution grid support is required. An availability rating will be derived from the operational data produced during the Project.
A 1 MW/1 MWh system will be able to receive additional revenue from secondary usage, in addition to providing grid benefits.	During the course of the Project, GI Energy will work with Con Edison and the NYISO to enable the battery system to participate in wholesale markets. The data from this project will enable better forecasting of these revenue streams when estimating future project economics.

Figure 1 - Hypotheses Being Tested

2.4 LINKAGES TO DEMO PRINCIPLES

Principle	Proposed Measure
Partnership between utility and third-party service provider; goal of third-party capital contribution	Con Edison will partner with GI Energy, who will provide customer acquisition; engineering, procurement and construction services; ongoing project management; dispatch services; and third-party financing (either directly or through established partnerships). Through GI Energy, Con Edison will also partner with Smarter Grid Solutions for communications integration.
Utility to identify problems and market should respond with solutions	Con Edison is aware of areas of network concern that could be supported through battery storage. GI Energy, through its experience in behind the meter DER development, has identified a model to enable greater storage adoption to address these needs and will engage customers in area of need with the Project model.

Principle	Proposed Measure
Clear delineation of how generated economic value is divided between the customer, utility, and third-party service provider; proposal for how much capital expense should go into the rate-bases versus competitive markets	This Project intends to prove out a financial structure that splits value between the various entities as follows. • Host customers benefit through lease payments for otherwise underutilized space. • Con Edison receives system benefits through the deferral of traditional investments, and through the lower cost of energy storage assets made possible through wholesale revenues. • Third-party developers receive quarterly payments from Con Edison for primary dispatch rights, as well as potential additional revenues from NYISO markets.
Market for grid services should be competitive	By identifying multiple constrained networks and multiple customers per constrained network, lease payments will be competitively selected based on network requirements and lowest requested lease payments of the pool of customers willing to participate. The Project is the initial test, with later expansion that will provide competition among developers.

Principle	Proposed Measure
Propose rules that will help create subsequently competitive markets; establish regulatory proposals to ensure safety, reliability, and consumer protection	The Project will be used to advance participation rules for storage in existing wholesale markets (energy arbitrage, frequency response, and capacity), which will increase certainty around secondary revenues for future installations. The Company anticipates that this information will create competitive markets in which developers factor the secondary revenue streams into their payback calculations, and then offer Con Edison lower guaranteed payment requirements for use of the batteries.
Inform pricing and rate design modifications and include opportunities for third parties to demonstrate how various rate design can be used to benefit consumers, encourage customer participation, and achieve REV's efficiency and bill management objectives	The Project will test the system value of FTM storage assets, to be compared to the system value of BTM storage assets, in reducing overall distribution system peak loads. This will inform future conversations regarding the value of both BTM and FTM energy storage, as well as potential discussions regarding tariff modifications.
Utilities should explore opportunities in their demonstration to work with and include various residential, commercial, institutional, and industrial customer participants	The Project allows a wide selection of customer classes to participate, including those that cannot usually participate in BTM battery systems. Whereas peak demand and load profile limit customer participation in the previous model, the only limitation for customers in the Project is available space.

Figure 2 - Linkages to Demonstration Principles

3.0 MARKET ATTRACTIVENESS

3.1 UNIQUE VALUE PROPOSITION

3.1.1 PARTICIPATING CUSTOMER

The value proposition for a participating customer is very simple: a flat, quarterly payment for the use of their site for an energy storage installation. This lease fee will be covered by Con Edison's quarterly payment. One of the hypotheses of this Project is that the simpler value proposition compared to BTM, and reduction of risk, will make it easier for customers of all types to monetize the opportunity that energy storage provides. One of the key objectives of the Project will be to determine how much customers will charge for lease payments, in different locations throughout the territory.

The Project expects the unique design of the FTM business model will create a considerably larger market, measured by number of customers who can participate, than would occur using the BTM model. With traditional BTM storage, only customers with the right load profile in the best locations and the ability to make the investment and manage a long-term contract with a third-party developer are able to participate. The business model tested for this Project applies to any customer with available space that is located in an area of need.

3.1.2 PARTNER/THIRD PARTY

Third-party financing will pay the battery manufacturers (NEC and UEP) for the cost of the battery storage solution, extended warranty and O&M work. For the Project, the third-party financer will recover these costs and a return on investment from the Company's quarterly payments. Smarter Grid Solutions ('SGS'), the communications and controls partner, was chosen because it is the leading provider of active network management ('ANM') technology. ANM is one of the leading foundational software control platforms for utilities to maximize benefit from DERs. SGS has been working with Con Edison extensively since 2013 on a NYSERDA co-funded microgrid project and has built a strong relationship with Con Edison and developed experience with the Company's electricity network and associated systems. Smarter Grid Solutions is a local firm based out of Brooklyn.

NEC is an industry leader that develops and manufactures advanced battery storage systems for many different sizes and applications. NEC has deployed megawatt scale commercial applications since 2009.

UEP is a New York based manufacturer commercializing rechargeable zinc-manganese dioxide batteries for stationary electrical energy storage applications. UEP focuses on

utilizing the same environmentally sustainable and abundant materials used in primary alkaline batteries, while maintaining high-performance and safe operation. Building on six years of research and development, UEP's modular battery systems meet every stationary energy storage need, scaling from residential to commercial to grid. UEP was formed to commercialize technology developed by the City University of New York ('CUNY') Energy Institute.

GI Energy has extensive experience in customer acquisition, due diligence, project development, construction, and operation of energy assets in New York. For more than a decade, GI Energy has focused on delivering energy solutions and has developed specific expertise navigating interconnection and regulatory challenges. As a result, the firm understands the relationship between a customer and the utility and the opportunities presented by innovative DER applications. GI Energy employs a customer acquisition strategy that relies on transparency and customer education.

3.1.3 UTILITY

The principle benefit to Con Edison is primary dispatch of the asset for T&D deferral, when required, as either demand response or NWA solution. The distribution value of the Project will depend on how frequently the system participates as demand response or NWA solution. In addition, Con Edison will be entitled to a share of the secondary revenues over the life of the contract.

3.1.4 SYSTEM

The business model for this Project is designed to expand the market of potential locations and customers for energy storage systems in order to lower the overall cost of energy storage projects and maximize T&D benefits. The system will benefit from a greater number of and less expensive opportunities to use energy storage to defer distribution infrastructure investments.

3.2 CUSTOMER SEGMENTATION

The Project will target host sites, located in constrained network areas, willing to host a battery storage system in exchange for a reasonable lease payment. Due to the FTM configuration, host building type, load profile, and customer type (multi-family, commercial, industrial, etc.) are not limiting factors when targeting customers. This is one of the key advantages of this business model over the BTM model.

3.3 CHANNELS

Working within the Con Edison target acquisition zones, GI Energy will identify suitable target parcels, approach customers, screen sites, and lease them.

Specifically, GI Energy's acquisition strategy will work through several channels to find suitable commercial and industrial sites for hosting the batteries. These channels include GI Energy's existing networks of:

- customers,
- affiliated energy partners,
- real estate developers,
- property owner associations, and
- financial intermediaries.

GI Energy's New York team will generate leads for potential project sites with the goal of producing enough viable sites to create real competition for the four final Project locations. Should the existing network of Project partners not generate enough leads, GI Energy will utilize its Sales and Marketing function's expertise, and approach additional real estate professionals, energy partners, property owners, associations and intermediaries.

GI Energy will work with all interested leads to determine site suitability. Criteria include, but are not limited to, sites:

- Within target network areas;
- Which meet building and zoning requirements for battery-storage technology, including but not limited to, setbacks, fire code, non-disturbance of existing utility infrastructure, preservation of parking, and visual impact;
- That have sufficient space to host an energy storage asset of the size proposed; and
- Where lease payments are equal to or less than the estimated price per square foot for lease of the property.

3.4 ABILITY TO SCALE

The Project tests the hypothesis that market size, and therefore scalability, will increase through FTM configuration by eliminating existing barriers to deployment. If successful, there will be few remaining barriers to implementation, excluding cost.

Con Edison and GI Energy believe battery storage costs and required lease payments will continue to decline over time as customers compete for additional revenue streams.

In addition, the Project will help to determine the value of the available secondary revenue streams. For the Project, all costs are covered by the quarterly payments from the Company. Secondary revenues have the potential to drive down costs for the Company's customers and present a potential upside for third-party developers. The magnitude of the secondary revenues will not be confirmed until the Project's conclusion. The Anticipated Future Market business model will take advantage of revenue information from the Project and can confidently anticipate market revenues to cover energy storage investment costs. This will decrease the revenue requirement recovered through the Company's quarterly fee closer to the marginal cost of battery usage. This cost reduction will make the FTM solution cost-effective for greater number of future grid needs.

4.0 DEMONSTRATION PLAN

4.1 METRICS FOR SUCCESS

Metric for Success 1 – FTM Battery Availability- Percentage

If battery storage systems are to be deployed instead of conventional grid infrastructure, it is critical that the Company be able to rely on the storage during times with peak distribution load. The performance of the systems, including availability issues, will be evaluated along with other battery projects to determine the appropriate value storage receives in Con Edison planning processes.

Metric for Success 2- Quantification of System Benefit- Dollars, MWh

The Project will measure and verify the quantity of energy absorbed or injected and the duration of benefit relative to system need, utilizing calculations outlined in the benefit cost analysis ('BCA') handbook. These measures will determine the ability of storage to provide real T&D support.

Metric for Success 3 – Larger Maximum Battery System Size per Site- MW, MWh

During the customer acquisition phase, GI Energy will collect information on 1) the largest maximum technically feasible battery system that can be hosted at each approached customer's site, and 2) the economics of siting various sized battery projects BTM. This data will test validity of the first hypothesis that BTM economics limit battery size.

Metric for Success 4 – Determination of Increased System Benefits for FTM batteries- MW

During the customer acquisition phase, GI Energy will collect customer interval data. This data will be analyzed to determine when a BTM system located on each customer's property would be dispatched in order to minimize demand charges for the customer. This hypothetical dispatch will be compared to the local distribution network's peak periods, which is when FTM batteries will be dispatched for load reduction. This will inform an analysis of distribution system peak load reduction for batteries of comparable size utilizing both BTM and FTM models.

Metric for Success 5 – Secondary Revenue Determination and Accessibility- Dollars

To access secondary revenues, the batteries must first be successfully enrolled in NYISO markets. The revenue generated through actual dispatch in the markets will be compared with theoretical values detailed in Section 5.

Through the Project, reporting will quantify the secondary revenues that 1 MW/1MWh batteries can earn for future implementations. The revenues can be scaled up or down to predict the amount earned for batteries of varying sizes.

4.2 TIMELINES, MILESTONES, AND DATA COLLECTION

As described in section 2.3 above, the Project will be deployed over four phases:

Phase 1: Customer acquisition, collection of market data, final site selection;

Phase 2: Detailed Engineering, equipment procurement, system installation/commissioning, and network integration;

Phase 3: Testing the technical ability of the energy storage assets to provide distribution level load relief to their local network; testing integration with the rest of Con Edison's distribution and control equipment; test dispatch in coordination with NYISO capacity, frequency regulation, and/or energy markets to validate secondary revenue streams; and

Phase 4: Enrollment of batteries into NYISO markets; continued dispatch in coordination with NYISO capacity, frequency regulation, and/or energy markets, as well as in response to signals from Con Edison.

Figure 3 depicts the estimated timing and key elements of each phase. All timing estimates are pegged to a Q2 2017 contract execution date, with preliminary customer acquisition activities occurring before the contract is finalized.

Phase	Key Elements	Milestones

Customer Acquisition ***Jan - Apr 2017***	Approach and Acquisition of Customers, Collection of Market Data	• Final site selection, including executed contract with host sites
		• Final contract between GI Energy and Con Edison, including finalized payments for host sites
		• Report detailing:
		  • Lease payment requirements
		  • Maximum size of energy storage assets that could be physically hosted by customers, and range of lease payment for full space.
		  • Average demand charge reduction that could be obtained by traditional BTM storage systems
		  • Average load reduction that could be obtained during local distribution grid's peak period

Construction, Commissioning & Integration ***May – Dec 2017***	Detailed engineering conducted, on-site construction work completed, systems procured/delivered, systems installed, systems commissioned, systems integrated into Con Edison distribution network, communications protocols set up and operational between systems and GI Energy/SGS and between GI Energy/SGS and Con Edison	• Engineering completed, equipment released for construction • Fire Department of the City of New York ('FDNY') and New York City Department of Buildings ('DOB') approval • On-site construction work completed • Communications protocols between Con Edison & GI Energy/SGS finalized • Batteries delivered/installed • Batteries commissioned • Communications and control tested • Batteries operating on distribution grid

Phase	Key Elements	Milestones
Dispatch Optimization ***Jan-Dec 2018***	Energy storage assets able to provide load relief to network, in coordination with Con Edison signals, while also dispatching according to various secondary market signals	• Testing and finalization of dispatch methodology that allows batteries to provide load relief to Con Edison while also dispatching to maximize secondary revenue sources • Test and verify ability to dispatch in real-time according to day-ahead projected NYISO participation; this is required to enable confidence that Project can meet NYISO obligations in Market Participation Phase • Report detailing batteries' projected secondary revenues, based on actual dispatch and/or market shadowing
Market Participation ***Jan 2019-TBD***	Energy storage assets able to actively participate in secondary markets, while continuing to provide load relief to network	• Successful enrollment of batteries, either individually or in aggregate, in NYISO markets • Participation of batteries in NYISO markets • Report detailing batteries' actual secondary revenues

Figure 3- Description of Project Phases

Data Collection

Where required, the Project design will specify installation of utility-grade watt-hour meters, current transformers ('CTs'), voltage transformers (or potential transformers, 'PTs') or other measurement devices, as listed in the most current version of the New York State Public Service Commission's ('PSC's') Approved Meter List and as prescribed in the PSC's Utility Metering Operating Manual (16 NYCRR Part 92). The meters will be equipped with communications ports that will allow direct, real-time connection to Con Edison's systems. In the event of a communications outage, the meters will have onboard storage capability for an agreed upon reading interval (e.g., 15-minute interval data) up to an agreed upon duration (e.g., 30 days).

GI Energy and SGS will ensure that the systems comply with the NYISO Tariff and Interconnection requirements for Control Center Requirements, Revenue Metering Requirements, and the Direct Communications and Reporting requirements, as detailed in the NYISO Operating procedures and as noted above.

The parties will collect and record the following key metrics on ambient and within-enclosure environmental conditions, which can be used to verify real-world impacts on

battery performance versus factory-tested specifications: dry-bulb temperature (°F), wet-bulb temperature (°F), ambient relative humidity (%), and barometric pressure (atm). Noise levels will also be tested at least once annually.

4.3 PARTICIPATION

4.3.1 TARGET POPULATION, SAMPLE SIZE, CONTROL GROUP

Customers will be targeted using the following criteria.

- Customers must be in zones targeted by Con Edison as needing distribution level grid support.
- Customer sites must meet building and zoning requirements for battery-storage technology, including; but not limited to; setbacks, fire code, non-disturbance of existing utilities, preservation of parking, and visual impact.
- Customers must have sufficient space on their property to host an energy storage asset of the size proposed.
- Customers with most value to the Project will be prioritized, based upon competitive real estate site, site characteristics and lease payments.

4.3.2 THIRD-PARTY PARTNERS

Con Edison will contract with GI Energy for the right of first dispatch. In exchange for quarterly payments from the Company, GI Energy and its partners will perform the following functions.

GI Energy will acquire third-party financing to cover the initial equipment and construction costs of the Project. While these costs will eventually be reimbursed back to the financer through the Company's quarterly payment, the provision of project financing still benefits the Project through lower upfront capital risk to the Con Edison. While Con Edison is eventually providing all of the capital, obtaining project finance for this "first of its kind" business model will enable more confidence for valuations in the Anticipated Future Market Model and lower barriers to obtaining project financing.

GI Energy will engage customers in targeted areas with sufficient space for an energy storage installation (see section 4.3.1 above for information on customer selection process). Once all suitable customers have been approached, GI Energy and Con Edison will make final site selection decisions.

GI Energy will procure the energy storage assets from the battery supply partners (NEC Energy Solutions and UEP) and coordinate all construction, installation and commissioning efforts.

After commissioning, GI Energy and Smarter Grid Solutions will work with Con Edison to integrate the battery assets with the wider SGS ANM Platform, Con Edison's XA/21 grid management system and the NYISO, as appropriate.

Once communications have been established, GI Energy and Smarter Grid Solutions will dispatch the battery such that the battery first reduces peak load on the local distribution grid, and secondarily earns revenue in NYISO markets. GI Energy and Smarter Grid Solutions will track the effectiveness of the batteries' dispatch according to metrics detailed in the Reporting section below.

4.3.3 UTILITY RESOURCES AND CAPABILITIES

Con Edison will assign one dedicated project manager to this Project; the project manager will be responsible for managing partners as well as ensuring the right utility resources, from engineering to PR, contribute to the Project when needed.

Con Edison engineers will work with Smarter Grid Solutions to develop electronic communication of the Company's dispatch requirements as well as real-time metering and verification.

4.4 OUTREACH TO TARGETED COMMUNITIES

This proposal does not require customers to be engaged in large numbers, instead choosing to focus on customer sites that could be suitable for larger-scale battery systems. GI Energy will approach potential sites through existing channels, as discussed in the Channels section 3.3 above. Because of the relatively small number of customer sites needed for this Project, outreach will be conducted through a one-on-one consultation between GI Energy personnel and each potential customer.

Motivating Customers

The Project offers a simple and attractive value proposition for potential customers. As most building owners in New York City are already familiar with the value of their real estate, additional lease revenue from previously underutilized spaces should align directly with their current business models. In addition, since the Project only requires four customer sites, motivating sufficient customer participation should not be an issue.

4.5 CONDITIONS/BARRIERS

4.5.1 MARKET RULES AND STANDARDS

The proposed design of the Project is closely aligned with the PSC's goals and objectives for REV demonstration projects, including Demonstrating Innovation, Value Distribution, Partnerships, Market Solutions, Developing Competitive Markets, and Scalability. The core concept driving the Project business model opens the storage market to a new pool of customers that were previously impeded by demand and load profile characteristics.

NYISO rules governing the participation of DERs may pose barriers related to the classification of FTM energy storage assets as Energy Limited Resources ('ELR'). ELRs generate secondary revenues through participation in capacity and frequency response markets. However, NYISO rules require that ELRs be able to provide a minimum 1 MW of power for four consecutive hours and they may not be aggregated between sites. Given the size of the Project, this would preclude the energy storage assets from participating in these markets, which necessitates that the Project initially rely upon "virtual" participation. GI Energy will simulate potential revenues based on the dispatch algorithm to determine realistic value of secondary revenues until these revenues can be achieved.

Additionally, the FDNY could provide a barrier or delay to the Project. FDNY has not yet approved lithium ion battery for this application in New York City. New York State Energy and Research Development Authority ("NYSERDA") and Con Edison are working together with the FDNY on testing and approval of large-scale lithium ion batteries in New York City. This work has continued with the Con Edison Virtual Power Plant demonstration project and continues to make progress. Con Edison and GI Energy will join this collaboration to seek approval for the Project.

4.5.2 CONSUMER PROTECTION

Customers will be contacted to evaluate their interest in participating in the Project. All analysis of site suitability will be conducted at no cost to the customer. GI Energy will ask all interested customers to sign a release allowing Con Edison to share interval data with GI Energy, as part of the Phase 1 Customer Acquisition plan. GI Energy will use this interval data to determine hypothetical BTM project economics. Raw customer interval data will not be shared publically, but may be presented on an anonymized and aggregated basis, as part of reports issued to the PSC, as detailed in the customer acquisition plan.

4.5.3 CHANNEL OR MARKET CHALLENGES

There is a risk that the land-use lease payments required for siting may be higher than expected. Because lease payments account for a relatively small portion of project costs, this is not expected to materially impact financials or schedule.

5.0 FINANCIALS

5.1 UTILITY REVENUE STREAMS

Revenue Stream	Estimated Maximum Revenue ($/MWh-year)	Forecasted Revenue ($/MWh-year)
Generation of System Benefits	Site Dependent	Site Dependent
Energy Arbitrage	$25,300	$15,200
Wholesale Capacity Markets	$34,000	$27,000
Frequency Response Markets	$15,000	$0

Figure 4 - Summary of Expected Revenue Streams

Con Edison expects to test five future revenue streams and sources of value.

1. Generation of system benefits (e.g., avoided costs) - from dispatch of distributed FTM energy storage assets. Con Edison will receive priority dispatch of the energy storage assets to relieve congestion and system constraints on the local distribution grid, either as a demand response resource or NWA solution for deferring T&D investments. The distribution value of the storage assets can be estimated based on participation in demand response programs or contribution to NWA solutions based on (i) the hourly reliability needs associated with the NWA, (ii) the relative cost of storage asset compared to other assets that are available at the same hours or that provide similar operational flexibility, (iii) risks of the storage asset relative to other substitutable resources, and (iv) the costs associated with the traditional infrastructure that is being deferred through the NWA. The frequency of use for system benefits can vary from year to year based on a variety of factors such as weather, consumer behavior and economic development. For example, of the networks identified in the DSIP, 90 percent of peak demand is exceeded anywhere from 1-22 days per year.

2. Energy Arbitrage –the FTM energy storage assets will have the ability to charge during periods that the wholesale electricity cost is low and discharge during periods that the wholesale electricity cost is high. Con Edison will be entitled to a portion of the revenue from this arbitrage, after round-trip efficiencies are taken into account. Based on historic prices, each 1 MWh battery would be able to access up to $25,300/year in revenue through leveraging the difference in energy prices between the day and night, for a total of just over $111,000/year for the 4.4 MWh of batteries combined. However, this is based on a best-case scenario, where the batteries'

dispatch prioritizes this revenue stream, and where all prices are known in advance. Assuming the most likely conditions, the Company estimates actual energy arbitrage revenue of $67,000/year.

3. Ancillary Services – the FTM energy storage assets, either individually or in aggregate, may have the ability to sell firm capacity into the wholesale markets, subject to Federal Energy Regulatory Commission ('FERC') and NYISO ELR participation rules. These markets may include the Spinning Reserve, 10-minute Non-Synchronous Reserve, the 30-minute Reserve markets, and conventional capacity markets. Con Edison will be entitled to a portion of the profits from the wholesale markets. Based on historic prices, the Company estimates that each 1 MWh battery will be able to earn up to $34,000/year in revenue, for a total of just under $149,000/year for the combined 4.4 MWh of batteries. However, this is based on a best-case scenario, where the batteries' dispatch prioritizes this revenue stream, and where all prices are known in advance. Assuming the most likely conditions, the Company estimates actual energy arbitrage revenue of $119,000/year.

4. Frequency Response Markets – the FTM energy storage assets, either individually or in aggregate, will have the ability to sell frequency regulation into the wholesale markets, subject to FERC and NYISO participation rules. Con Edison would be entitled to a share of the profits from the wholesale markets. Based on historic NYISO frequency response prices, the Company estimates that each 1 MWh battery will be able to earn $15,000/year in revenue from the frequency response markets. However, the Company assumes that this will be the least attractive of the secondary revenue sources and will not be part of the optimized dispatch strategy. Therefore, the current estimate of actual frequency response revenue that would be received by the 4.4 MWh of energy storage is $0/year.

The total amount of estimated secondary revenue streams is $42,000 per 1 MWh battery, or $186,000/year for all 4.4MWh of all energy storage assets combined.

5.2 INVESTMENTS

The total projected Project cost is $11.7 million; external costs will be amortized over the life of the project in the form of quarterly payments from Con Edison to GI Energy. The costs are Con Edison's project management and the payments the Company will make to the developer, which will support the lease payments, developer project management, installation, associated operation and maintenance services, operation and dispatch of the

energy storage assets, return on the financing partner's initial investment and integration of the energy storage assets into Con Edison's communication and control systems. GI Energy will manage cash flows to Smarter Grid Solutions, NEC, and UEP to ensure all project costs are paid in a timely manner from third-party financer and Con Edison quarterly payments.

	Total	2017	2018	2019	2020	2021
Total	$11.7mm	$2.3 mm	$2.3mm	$2.3mm	$2.3mm	$2.3mm

The total cost exceeds the value of the infrastructure deferral benefits attributable to the energy storage assets. However, as energy storage prices continue to fall, the Company anticipates that future projects of this type will be able to provide distribution grid deferral benefits that exceed the cost of the Con Edison's payments. These benefits could be similar to the services provided by demand response or as part of a portfolio solution for one of the future NWAs. The Company anticipates that developers will compete to offer to accept the lowest payments to Con Edison for equivalent systems, with projected secondary revenues reducing the amount of those utility payments.

Pricing for the Project

Customers acting as host sites for the Project will have no upfront cost, other than transaction costs, and will receive a monthly lease payment for the use of their sites.

Timing of Investments

Con Edison's costs will be in the form of pre-agreed quarterly payments, over the life of the contract.

Third-party Capital

GI Energy will secure third-party financing for the Project. The third-party partner will receive a return on its investment through the ongoing quarterly payments made by Con Edison over the lifetime of the agreement. There are no additional external sources of funding for the Project.

5.3 RETURNS

Post Project, Con Edison will be entitled to a share of the four identified secondary revenue streams identified in section 5.1 above as market-based earnings. The magnitude of these secondary revenue streams is uncertain. The Company currently estimates that each 1

MWh energy storage asset can earn $42,000 annually. The Company estimates that all 4.4 MWh of energy storage assets will be able to earn $186,000/year.

5.4 BENEFITS

5.4.1 QUALITATIVE BENEITS

The Company anticipates that qualitative benefits achieved through the Project will include operational learning and an increased understanding of a customer's price threshold for hosting Project-size energy storage assets. Further benefits include information regarding maximum battery size that can be installed (both technically and economically), as well as direct comparison of BTM and FTM battery economics, and the overlap between typical customers' peak load and local network's peak load. Finally, the validation and quantification of secondary revenues earned by the energy storage assets can be used to drive lower costs to Con Edison for future energy storage projects.

5.4.2 QUANTITATIVE BENEFITS

Quantitative benefits include any value derived from the use of the energy storage assets for peak load reduction, as well as Con Edison's share of secondary revenues The total estimated earnings for the aggregated 4.4 MWh of storage capacity is $186,000/year.

5.4.3 COST EFFECTIVENESS

The cost effectiveness of this business model depends on the T&D benefit Con Edison will receive. This will vary by network area, and may be minimal for the Project because the amount of energy storage on any one network will likely not be sufficient to defer infrastructure investment. However, as costs for energy storage continue to fall, energy storage will increasingly be able to economically defer distribution system component upgrades, such as substations.

6.0 REPORTING

The following metrics are tailored to each phase of implementation.

Phase 1: Customer Acquisition

These metrics will test the stated hypotheses concerning FTM versus BTM scalability, alignment with network peaks, and customer willingness to pay for limited backup generation.

Key Metric Measured	Definition/Methodology	Metric for Success Supported
Customer Information Acquired	Number of customers for which interval data and price threshold information for hosting system has been acquired	3, 4
FTM Versus BTM Maximum System Size	Data acquired and reported on maximum technical and economic system size for FTM and BTM systems at participating customer sites	3
FTM Versus BTM Load Reduction During Local Network Peak Periods	Data acquired and reported on average load reduction that could be obtained for various FTM and BTM battery systems during network peak periods, as a function of battery system size	4
Host Site Contracts Finalized	Number of finalized contracts between Con Edison/GI Energy and selected host sites	1, 2, 5

Figure 5 - Key Metrics - Phase 1

Phase 2: Construction/Commissioning & Integration

Phase 2 metrics measure ability to deliver and integrate 4.4 MWh of distributed energy storage assets into Con Edison's network across four sites by the expected completion date. GI Energy will demonstrate that the energy storage assets are able to be integrated into the operation of the distribution grid and dispatched as a firm resource.

Key Metric Measured	Definition/Methodology	Metric for Success Supported
Battery Capacity Commissioned	Amount of energy storage in MWh that has been commissioned and technically ready to be dispatched	1, 2, 5

Key Metric Measured	Definition/Methodology	Metric for Success Supported
Battery Capacity Integrated Into Con Edison	Amount of energy storage in MWh that has been integrated into Con Edison's grid management system (XA/21), and NYISO, as measured by successful test dispatch in coordination with communication from Con Edison	1, 2, 5

Figure 6 - Key Metrics – Phase 2

Phase 3: Dispatch Optimization

Phase 3 will measure ability to dispatch the batteries to provide firm support to Con Edison's local distribution system when needed, while also maintaining participation in NYISO markets to earn secondary revenue. Throughout this period of dispatch optimization, GI Energy will also track the batteries' general operating parameters.

Key Metric Measured	Definition/Methodology	Metrics for Success Supported
Battery Overall Reliability Factor	Overall amount of distribution system peak reduction that has been provided by the batteries, compared to the theoretical maximum	1, 2
Simulated Secondary Revenue	Amount of secondary revenue that the batteries would have earned each period, if the batteries could bid into NYISO markets. Reported by Energy Arbitrage, Capacity, and Regulation Service [1]	5
Dispatch Efficiency	Variance between amount of secondary revenue that the batteries would have earned each period and theoretical maximum amount of secondary revenue that could have been earned over that period	5
NYISO Enrollment	Successful NYISO acceptance of Project batteries into NYISO markets	5

Figure 7 - Key Metrics - Phase 3

[1] Energy Arbitrage will likely not be from the NYISO markets, but instead through contracts negotiated with one or more third party energy suppliers.

Phase 4: Market Participation Phase

During Phase 4, the batteries will continue to be dispatched in order to provide load reduction to Con Edison's local distribution network, while also maximizing secondary revenue.

Key Metric Measured	Definition/Methodology	Metric for Success Supported
Battery Overall Reliability Factor	Percent of availability and performance	1, 2
Actual Secondary Revenue	Amount of secondary revenue that the batteries have earned each period assuming NYISO participation	5
Dispatch Efficiency	Variance between amount of secondary revenue that the batteries would have earned each period and the theoretical maximum amount of secondary revenue that could have been earned over that period	5

Figure 8 - Key Metrics - Phase 4

7.0 CONCLUSION

7.1 POST-DEMONSTRATION BENEFITS

7.1.1 QUALITATIVE

Data from Phase 1, Customer Acquisition, can be used to help understand the true value of BTM batteries to the local distribution system. Operational data from Phases 3 and 4 of this Project can be used to inform the true system value of FTM batteries. This information will inform future BCA's for energy storage projects or discussions on potential rate tariffs.

Phases 3 and 4 of the Project will also quantify secondary revenue streams associated with battery storage projects and verify that all entities involved are able to realize additional earnings. This will de-risk future projects, resulting in lower return requirements for financiers as confidence in secondary revenues is established, further reducing utility payments. The intention is to accelerate the use of energy storage for distribution investment deferral purposes.

The Project will also help to accelerate the development of UEP, a New York State-based energy storage manufacturer utilizing zinc-manganese dioxide, a novel chemistry. This technology has the potential to be more cost-effective than lithium-ion in the long-term. The company has opened a New York State-based manufacturing facility. If UEP is successful, the company has the potential to create high paying jobs in New York State, as well as to contribute to the continued decreasing prices of energy storage.

7.1.2 QUANTITATIVE

As a result of the Project, Con Edison anticipates obtaining quantifiable data to support the conclusion that battery storage projects can reliably defer distribution grid investment, while being utilized for wholesale market participation during off-peak times. The data from the Project will be able to be used to support further battery storage integration efforts.
The Project will be used to demonstrate physical capability of battery assets to provide T&D value and wholesale benefits. The operational data will be used to advance battery storage participation in wholesale markets, enabling future projects to capture the estimated $186,000/year in secondary revenues the FTM business model unlocks.

7.2 PLANS TO SCALE

As noted in section 3.4, the structure proposed in the Project has been developed to be highly scalable. As storage prices decrease, the number of locations where batteries can be cost effectively used will increase.

If the Project is able to prove the stated hypotheses, Con Edison will be able to competitively solicit additional projects under this business model from a range of developers.

7.3 ADVANTAGES

The key advantage of the Project is testing the FTM business model, which the Company believes will provide benefits to third parties, customers and Con Edison while expanding market potential of the business model. The Company believes that the FTM business model will remove many of the standard customer barriers to entry, while maximizing asset benefit to the grid for Con Edison. This easily scalable and mutually beneficial model will assist in the proliferation of battery storage as costs continue to decline, furthering adoption of a much needed tool to maintain resiliency and reliability and achieving the New York State Reforming the Energy Vision.