



---

REV Demonstration Project:  
Commercial Battery Storage

2019 3Q Quarterly Progress Report

---

**Dated: October 31, 2019**

## Table of Contents

<b>1.0</b>	<b>Executive Summary .....</b>	<b>2</b>
1.1	Program Achievements.....	2
1.2	Cybersecurity and Personally-Identifiable Information Protection.....	2
1.3	Accounting Procedure Established.....	2
1.4	Costs, Benefits, and Operational Savings.....	3
1.5	Commercial Battery Storage .....	3
<b>2.0</b>	<b>Commercial Battery Storage – Quarterly Progress .....</b>	<b>5</b>
2.1	Demonstration Highlights .....	5
2.1.1	Since Previous Quarter - Major Task Completion .....	5
2.1.2	Activities Overview.....	5
2.1.3	Key Metrics.....	6
2.1.4	Next Quarter Forecast.....	6
2.1.5	Checkpoints/Milestone Progress .....	7
2.1.6	Planned Activities.....	7
2.1.6.1	Customer Acquisition .....	7
2.1.6.2	Construction/Commissioning and Integration.....	8
2.1.6.3	Dispatch Optimization .....	8
2.1.6.4	Market Participation .....	8
2.2	Changes to the Project Design.....	8
2.3	Work Plan & Budget Review .....	9
2.3.1	Phase Review.....	9
2.3.1.1	Phase Progress .....	9
2.3.2	Work Plan.....	9
2.3.3	Updated Budget .....	9
2.4	Conclusion.....	9
2.4.1	Lessons Learned .....	9
2.4.2	Recommendations .....	10
2.5	Included Appendices.....	10

---

## **1.0 EXECUTIVE SUMMARY**

---

Consolidated Edison Company of New York, Inc. (“Con Edison” or the “Company”) submits this quarterly report on the progress of the Commercial Battery Storage REV Demonstration Project (the “Project”) it is implementing as part of the Reforming the Energy Vision (“REV”) proceeding, as required by the *Order Adopting Regulatory Policy Framework and Implementation Plan*, issued by the New York State Public Service Commission (“Commission”) on February 26, 2015.<sup>1</sup>

### **1.1 PROGRAM ACHIEVEMENTS**

On January 20, 2017, Con Edison submitted the Project for approval by Department of Public Service Staff (“DPS Staff”). On May 18, 2017, DPS Staff approved the Project. Con Edison filed an implementation plan for the Project with the Commission on June 15, 2017. In Q3 2019, the Company focused on the implementation of the Project, customer acquisition and construction, and preparation for the NYISO pilot.

### **1.2 CYBERSECURITY AND PERSONALLY-IDENTIFIABLE INFORMATION PROTECTION**

Consistent with Commission policy related to cybersecurity and the protection of personally-identifiable information (“PII”), each partner agreement executed for the implementation of the Project includes specific protections related to cybersecurity and PII. This protection is critical in encouraging customers to sign up with new and innovative services offered by utilities.

### **1.3 ACCOUNTING PROCEDURE ESTABLISHED**

On February 16, 2016, in Case 15-E-0229, Con Edison filed an accounting procedure for the accounting and recovery of all REV demonstration project costs.<sup>2</sup> This accounting procedure establishes a standardized framework that will govern how the Company categorizes and allocates the costs of the REV demonstration

---

<sup>1</sup> Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015).

<sup>2</sup> Case 15-E-0299, *Petition of Consolidated Edison Company of New York, Inc. for Implementation of Projects and Programs that Support Reforming the Energy Vision*, General Accounting Procedure (issued February 16, 2016).

projects, and will facilitate analyzing each project to determine the overall financial benefits of the program to customers.

#### **1.4 COSTS, BENEFITS, AND OPERATIONAL SAVINGS**

Budget information for all of the Company's REV demonstration projects is being filed confidentially with the Commission, concurrently with the filing of this document. All costs filed are incremental costs needed to implement the projects. To date, no tax credits or grants have been available to reduce the net costs of the projects, but Con Edison will take advantage of such offsetting benefits when, they are available. Due to the early stage of implementation for the Project, there are no operational savings to report at this time.

#### **1.5 COMMERCIAL BATTERY STORAGE**

Using 4 sites, the Project will demonstrate how distributed, front of the meter ("FTM") energy storage can provide transmission and distribution ("T&D") support, earn wholesale market revenues, and increase the market size of participating customers by aligning the interests of the Company, customers, and third-party developers. Con Edison is executing the Project in partnership with GI Energy and Smarter Grid Solutions.

In Q3 2019, Con Edison and GI Energy continued construction and commissioning for the first two sites. The first is expected to be operational in Q4 2019 and the second in Q1 2020.

The third project site, at 2900 Amboy Road in Staten Island, has hit a significant roadblock due to a zoning determination from the NYC Department of Buildings. This project is still in the portfolio but if the zoning variance approval is projected to take longer than starting over at a new site, it could drop out. As a contingency plan, GI Energy is evaluating several other sites as potential backups while also moving forward with obtaining a zoning variance approval. GI Energy is still evaluating timelines to make this decision.

GI Energy finalized a lease agreement with a fourth site in Woodside, Queens (replacing the Department of Sanitation site that dropped) and has submitted interconnection and FDNY applications.

Communications integration has been largely finalized for Con Edison dispatch capabilities from a desktop application and Con Edison's regional control centers. Con Edison, GI Energy, SGS, and the NYISO held a productive planning session for the NYISO pilot, which will be a development or "sandbox" test of how batteries might participate in eventual wholesale markets.



---

## **2.0 COMMERCIAL BATTERY STORAGE – QUARTERLY PROGRESS**

---

### **2.1 DEMONSTRATION HIGHLIGHTS**

#### **2.1.1 Since Previous Quarter - Major Task Completion**

- Customer Acquisition: Project team submitted interconnection and FDNY applications for a fourth site. The team has also identified potential backup locations for the third site that had begun construction but received an unexpected zoning determination from NYC DOB.
- Construction/Commissioning and Integration:
  - Caddell construction is complete with exception of work for fire suppression and sprinklers. Communications testing has been completed.
  - City Island construction is complete and the construction permit was re-instated. Communications testing scheduled for November.
  - Scheduled an FDNY walkthrough for the 4<sup>th</sup> site in Woodside, Queens.
- Market Participation: Held a planning meeting at the NYISO with Con Edison, GIE, SGS to finalize communications platform and NYISO pilot process.

#### **2.1.2 Activities Overview**

Phase 1, Customer Acquisition: The team is actively pursuing backup sites if the third site in Staten Island drops due to a DOB zoning ruling. A fourth site is moving forward with permit applications.

Phase 2, Construction/Commissioning and Integration:

- City Island construction is near completion. All electrical work is complete and Fire suppression permits have been received.
- Civil and electrical work at the second site, Caddell, is complete, and commissioning is substantially completed. FDNY inspections are delayed due to availability of inspectors and final inspection of the fire alarm is scheduled for December 2019. Remaining inspections (DOB, interconnection, fire suppression/sprinklers) are expected in November. SGS communications integration with Con Edison for the Caddell site has been completed.
- For the third site, 2900 Amboy, DOB has denied the permit application based on an unexpected zoning ruling. Construction and interconnection work are on

hold and the project team is evaluating options to obtain a variance or drop the site.

Phase 3. Dispatch Optimization: SGS has developed the user interface for dispatch and has tested communications up to the Con Edison SCADA network. Full communications functionality through SCADA was completed.

Phase 4, Market Participation: The Project team held a day-long meeting at the NYISO to discuss mechanics of the NYISO pilot. SGS is developing a scope of work for integration into the NYISO pilot communications platform. Phase 4 has been materially delayed by the NYISO's response to FERC Order 841 which delays battery market participation and dual participation to *no earlier than* May 2020 and applies Buyer Side Mitigation to storage resources below 2 MW.

### **2.1.3 Key Metrics**

In Q3 2019, the Project team continued customer acquisition activities and made significant progress on communications integration activities. The following data support these Phase 1 metrics (targets were set as 200 potential sites identified, 30 viable project sites, and four final project sites).

- Potential Sites Identified: 471 / 200 (target)
- Customers Approached: 396 / 471
- Customer Intake Forms Collected: 47 / 396
- Walkthroughs Conducted: 35 / 47
- Sites Selected for permitting: 5 / 4 (target)
- Sites with interval data: 5 / 20

### **2.1.4 Next Quarter Forecast**

In Q4 2019, the Project team expects to have at least one operational site at the first location in Staten Island. The City Island site will have gone through most of its commissioning A backup site for the Amboy site is expected to have completed lease option negotiations. The team expects to make a decision to continue with the Amboy site or go to the backup site. The team expects to receive a Letter of No Objection from the FDNY and DOB permits for the fourth site in Woodside.

The Project Team plans to complete communications integration build-out for the City Island site.

Dispatch Optimization (Phase 3) is expected to begin with the enrollment of the first two assets into the NYISO Pilot Program.

### 2.1.5 Checkpoints/Milestone Progress

Checkpoint/Milestone	Timing*	Status
Customer Acquisition	Phase 1 Midpoint / End	
Construction/Commissioning and Integration	Phase 2 Midpoint / End	
Dispatch Optimization	Phase 2 End	
	Phase 3 Midpoint/End	
Market Participation	Phase 4 Quarterly	

\*Detailed descriptions of the Phases can be found in the Appendices.

#### Legend

On Schedule	Delayed w/out Major Impact	Delayed or Stopped – Project Goals Impacted
-------------	----------------------------	---

### 2.1.6 Planned Activities

#### 2.1.6.1 Customer Acquisition

**Status:** Yellow

**Expected Target by Phase 1 Midpoint:** Identification of 30 viable customer sites and a minimum of 20 sites for behind the meter (BTM) vs. FTM analysis

**Actual by Phase 1 Midpoint:** 30 viable customer sites identified, waiting on customer interval data to assess sites for BTM vs. FTM analysis

**Solutions/strategies in case of results below expectations:** In line with root-cause analysis, actions may include reassessing target, increasing marketing and outreach efforts, or adjusting monetization strategies to encourage improved customer acquisition efforts.



### **2.1.6.2 Construction/Commissioning and Integration**

**Status:** Yellow

**Expected Target by Phase 2 End:** 4 MW/ 4 MWh installed storage across four sites

**Actual by Phase 2 Midpoint:** N/A

**Solutions/strategies in case of results below expectations:** The Project team will work to proactively manage any permitting restrictions that might delay construction and commissioning of project sites. The team will continually evaluate progress and adjust to back-up project sites if there is a site-specific issue.

### **2.1.6.3 Dispatch Optimization**

**Status:** Green

**Expected Target by Phase 2 End:** Demonstrated aggregation and dispatchability of storage capacity

**Actual by Phase 2 End:** N/A

**Solutions/strategies in case of results below expectations:** In-line with root-cause analysis, actions may include systems upgrades, modified systems integration, and/or process review.

### **2.1.6.4 Market Participation**

**Status:** Red

**Expected Target by Phase 3 End:** enrollment of batteries into NYISO markets

**Actual by Phase 3 End:** N/A

**Solutions/strategies in case of results below expectations:** The Project team will work with NYISO and other relevant stakeholders to identify alternative forms of battery participation, such as pilot projects. If no other suitable means exist, assets will continue to be dispatched to shadow NYISO markets and demonstrate the potential for revenues.

## **2.2 CHANGES TO THE PROJECT DESIGN**

There were no changes to the project design in Q3 2019.

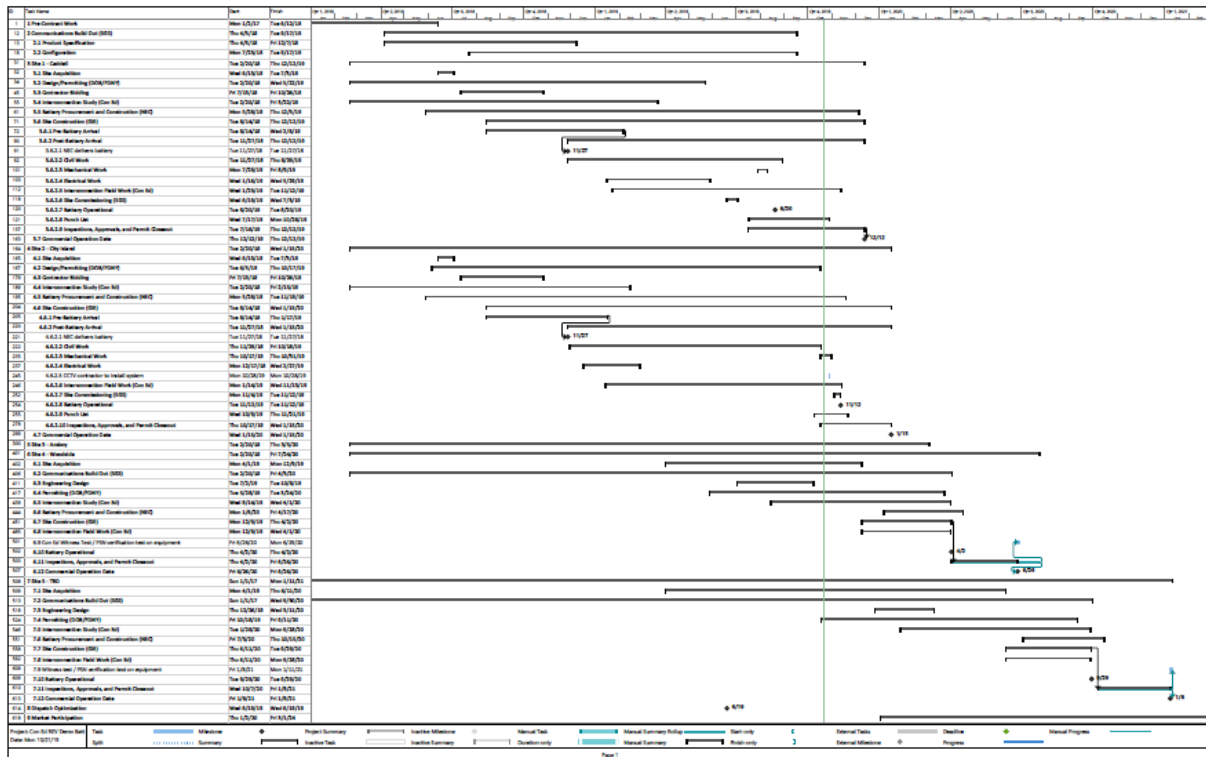
## 2.3 WORK PLAN & BUDGET REVIEW

### 2.3.1 Phase Review

#### 2.3.1.1 Phase Progress

The Project team has completed Phase 0 (Project Planning) and continues to make progress on Phase 1 (Customer Acquisition), Phase 2 (Construction/Commissioning and Integration) and Phase 3 (Dispatch Optimization). The Project team anticipates Phase 1 will be completed in Q4 2019 with receipt of applicable permits for final site. Phase 2 will begin for third and fourth sites which are expected to receive permitting approval in Q4 2019 and Q1 2020.

### 2.3.2 Work Plan



### 2.3.3 Updated Budget

Budget information is being filed confidentially with the Commission.

## 2.4 CONCLUSION

### 2.4.1 Lessons Learned

The team was successful in identifying nearly 150 percent of the customer identification target and successfully converted these leads to meet the viable site goal. However, the team encountered delays and difficulties in completing a site lease with DCAS the owner for the DSNY project site. While the team was unable to execute a lease due to the contract impasse, the Company continues to engage the City on a potential resolution for future projects. DCAS is a major land owner within the Con Edison service territory and could provide many beneficial sites for future storage projects.

The NYC DOB issued a bulletin on zoning treatment for “non-accessory” battery sites in 3Q 2019. This bulletin clarified the zoning treatment for front-of-the-meter storage assets and will help developers identify feasible sites from a zoning perspective. However, it may also require a change in occupancy for any permit submittals. An “accessory” bulletin is expected and potentially a full revision of the NYC zoning code in relation to energy storage.

The team continues work on the analysis of BTM economics applied to the sites identified to this FTM project, as outlined in the Project Filing. The measurement of this metric has been delayed due to difficulty obtaining interval data and ongoing customer acquisition activities. The lack of interval data for the majority of viable project sites is an early indication that FTM model can be applied and scaled in locations that are unavailable for a BTM model.

The market participation rules for battery storage continue to evolve. The Project team continues to work with NYISO and other storage stakeholders to understand and inform these evolving rules. To this end, the Project team has volunteered to be a test case for Q3 2020 battery aggregation rules. If chosen, this collaboration will benefit not only the Project, but also enable the creation of battery market in New York.

#### **2.4.2 Recommendations**

The Company recommends maintaining open lines of communication with the Mayor’s Office to understand the implications of zoning rules for this project and the storage market in New York City in general.

### **2.5 INCLUDED APPENDICES**

The following appendices are included at the end of this Quarterly Progress Report:

Appendix A: Commercial Battery Storage Description of Phases

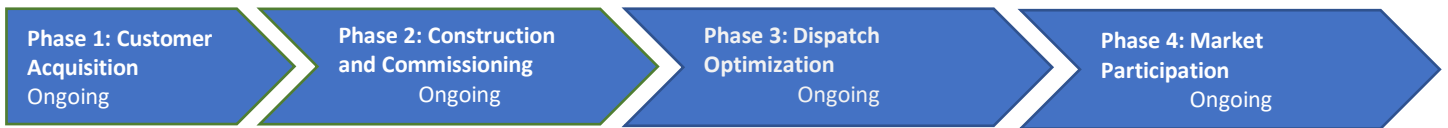
## Appendix A: Commercial Battery Storage Description of Phases

Phase	0. Project Planning	1. Customer Acquisition	2. Construction / Commissioning and Integration	3. Dispatch Optimization	4. Market Participation
<b>Milestone (Stage Gate to Next Phase)</b>	<i>Negotiations to be Completed</i> <ul style="list-style-type: none"> <li>• DPS approval</li> <li>• Partner contracts signed</li> </ul>	<i>Successfully execute leases for four customer sites</i> <ul style="list-style-type: none"> <li>• Final site selection</li> <li>• Execute customer lease contracts</li> </ul>	<i>Install and commission 4.2 MW/4.4 MWh</i> <ul style="list-style-type: none"> <li>• Design approval</li> <li>• Obtain permits</li> <li>• Battery installation</li> <li>• System commissioning</li> </ul>	<i>Dispatch for load relief</i> <ul style="list-style-type: none"> <li>• Cyber-secure communication architecture</li> <li>• HMI functionality</li> <li>• Established NOC</li> </ul>	<i>Assets participate in wholesale markets</i> <ul style="list-style-type: none"> <li>• Earn revenues in all market products available for battery participation</li> </ul>
<b>Key Elements</b>	<ul style="list-style-type: none"> <li>• Letter of No Objection</li> <li>• Developer contracted</li> <li>• Third-party financing identified and contracted</li> </ul>	<ul style="list-style-type: none"> <li>• Customer lead identification</li> <li>• Complete site Walkthroughs</li> <li>• Complete viable site identification</li> <li>• Final site selection</li> <li>• Market analysis for FTM vs. BTM</li> </ul>	<ul style="list-style-type: none"> <li>• Interconnection and civil design</li> <li>• Interconnection application and study</li> <li>• Permitting</li> <li>• Communications integration</li> <li>• System testing and training</li> </ul>	<ul style="list-style-type: none"> <li>• Assets can be dispatched individually or in aggregate by each party</li> <li>• Fully integrated into SCADA with HMI functionality</li> <li>• Calculate T&amp;D benefit values</li> </ul>	<ul style="list-style-type: none"> <li>• Enroll in NYISO markets allowed today</li> <li>• Continue participation in DER roadmap proceedings to increase participation for ELRs</li> <li>• Quantify market revenues achievable under stacked value model</li> </ul>
<b>DER Categories</b>	N/A	N/A	<ul style="list-style-type: none"> <li>• Battery Storage</li> </ul>	<ul style="list-style-type: none"> <li>• Battery Storage</li> <li>• DER Aggregation</li> </ul>	<ul style="list-style-type: none"> <li>• Battery Storage</li> <li>• DER Aggregation</li> </ul>

## Commercial Battery Storage REV Demo Project

The **Commercial Battery Storage** project is designed to demonstrate how distributed, front of the meter (“FTM”) energy storage can be utilized to provide transmission and distribution (“T&D”) support, earn wholesale market revenues, and increase the market size of participating customers by aligning the interests of the Company, customers, and third-party developers. Con Edison is executing the Project in partnership with GI Energy and Smarter Grid Solutions.

Project Start Date: January 2017  
 Project End Date: December 2020  
 Budget: \$11.7M  
 Q2 2019 Spend: *Filed Confidentially*  
 Cumulative Spend: *Filed Confidentially (on budget)*



### Lessons Learned: Customers

- Engagement with the City is ongoing and important to find potential resolution for future projects. The team was unable to execute a lease at a City site due to a contract impasse discovered after permitting was obtained.
- The lack of interval data for most viable project sites is an early indication that the FTM model can be applied and scaled in locations that cannot support a BTM model.
- Site leases are becoming more competitive with multiple storage companies offering leases

### Lessons Learned: Market

- The Project Team has volunteered to be a test case for Q3 2020 battery aggregation rules. If chosen, this collaboration will benefit the Project and the larger New York battery market.
- NYC DOB’s zoning determination has clarified treatment for non-accessory uses

**Application of Lessons Learned:** *To be determined based on outcomes of City engagement and potential NYISO collaboration.*

**Issues Identified:** *A DSNY site that had received FDNY and DOB permits dropped out after conversations stalled on contract terms. A zoning determination from DOB could cause the loss of the third site. NYISO’s response to FERC Order 841 delays battery market participation and dual participation to no earlier than 4Q 2020 and applies Buyer Side Mitigation to storage resources below 2 MW.*

**Solutions Identified:** *Have identified potential replacement sites and exploring variance process timelines. Working with NYISO on pilot for market participation.*

**Recent Milestones:** *a) Construction permit re-instated for City Island b) Completed communications integration for Caddell site c) Submitted FDNY and interconnection applications for a fourth site d) Scheduled final FDNY inspections for Caddell*

**Upcoming Milestones:** *Complete commissioning on first 2 sites (4Q 2019, 1Q 2020). Determine go/no-go for Amboy site and proceed with variance process or permit applications for a backup site (4Q 2019). Complete communications integration build out and control assets for City Island site (1Q 2020). Enroll first asset in NYISO pilot program (4Q 2019).*