REV Demonstration Project:
Commercial Battery Storage

2020 Q1 Quarterly Progress Report

Dated: April 30, 2020

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1.0 EXECUTIVE SUMMARY

Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company") submits this 1st quarterly report for 2020 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.[1] 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.

1.1 PROGRAM ACHIEVEMENTS

The Project has been impacted during Q1 of 2020 by social distancing guidelines and executive orders issued by the federal government and the State of New York in response to the COVID-19 pandemic.[2] Due to the "New York State on PAUSE" executive order, all construction and on-site work on the Project has ceased as of March 22, 2020. This will impact timelines for the non-operational sites.

In Q1 2020, the Company tested operation of the first site, continued customer acquisition and construction, refined integration of SCADA communications, and prepared 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] 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).
[2] See "*Proclamation on Declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) Outbreak*" (www. whitehouse.gov) (issued March 13, 2020)*; "30 Days to Slow the Spread" The President's Coronavirus Guidelines for America* (www.whitehouse.gov) (issued March 30, 2020); and *"New York State on PAUSE"* Executive Order issued by New York Governor Andrew Cuomo (www.coronavirus.health.ny.gov) (effective March 22, 2020).

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.[3] This accounting procedure establishes a standardized framework that will govern how the Company categorizes and allocates the costs of the REV demonstration 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 four sites, the Project seeks to 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 ("SGS").

In Q1 2020, Con Edison and GI Energy completed commissioning for the first site. The second site completed a majority of commissioning items and DOB has requested updated electrical drawings prior to electrical inspection.

The third site at Amboy Road dropped out due to a complex zoning issue and the site host decision to use the land for another project. GI Energy is working on lease negotiations for a backup site.

[3] 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).

GI Energy has received most approvals to begin construction at the fourth site in Woodside, Queens. Pending a conditional letter of acceptance from DOB and lifting of NYS Pause, they will begin construction.

Con Edison began using the desktop application for dispatch of the first battery. Smarter Grid Solutions is refining the capabilities of the regional control center screens in Q2 2020. The NYISO pilot will begin with the first operational battery once communications testing is complete.

2.0 COMMERCIAL BATTERY STORAGE – QUARTERLY PROGRESS

2.1 DEMONSTRATION HIGHLIGHTS

2.1.1 Since Previous Quarter - Major Task Completion

- Customer Acquisition: The Project team is negotiating lease options for a backup location for the third site.
- Construction/Commissioning and Integration:
    - Caddell was operational as of February 6, 2020.
    - City Island has obtained FDNY signoff on inspections. DOB electrical inspections and interconnection testing are pending Electrical Advisory Board (“EAB”) review of updated drawings.
    - Woodside received the DOB construction permit. Construction is pending Office of Technical Certification and Research (“OTCR”) acceptance due to a new peer review requirement from DOB.
- Market Participation: NYISO has resolved communications issues with its hardware. SGS has started to test communications.

2.1.2 Activities Overview

Phase 1, Customer Acquisition: GIE Energy is negotiating a lease option for a backup site on Pitkin Avenue to replace the Amboy site that formally withdrew from the Project.

Phase 2, Construction/Commissioning and Integration:

- City Island construction is complete. Communications testing and Con Edison SCADA testing is complete. The site passed all FDNY inspections in February 2020. DOB electrical inspection is expected to occur in Q2 2020 upon completion of DOB review of updated electrical drawings which will be followed by interconnection signoff and operation.

- The Caddell site is operational as of February 6, 2020.

- The fourth site, Woodside is now subject to a new peer review requirement from DOB that was not in place for the other projects. This must be completed before construction can begin. Any construction is also on hold due to "New York State on PAUSE" and the impacts of the COVID-19 pandemic.

Phase 3. Dispatch Optimization: Con Edison is entering dispatch schedules for the Caddell site. SGS is working on a software fix to address some minor issues, but functionality has not been impacted. In January 2020, a walkthrough of the SCADA screens with control center operators led to identification of refinements that are necessary for the screens. These refinements are scheduled to be completed in Q2 2020.

Phase 4, Market Participation: NYISO has resolved communications issues with the hardware and testing will be completed by SGS in Q2 2020. The Pilot will likely begin with one battery due to the delays at the second site.

2.1.3 Key Metrics

In Q1 2020, 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: 620 / 200 (target)
- Customers Approached: 471 / 620
- Customer Intake Forms Collected: 49 / 471
- Walkthroughs Conducted: 44 / 49
- Sites Selected for permitting: 7 / 4 (target)
- Sites with interval data: 5 / 20

2.1.4 Next Quarter Forecast

Barring continued impacts from the COVID-19 pandemic, the Project team expects to have two operational sites. The Project team expects to complete a peer review for the Woodside site and receive DOB approval to begin construction at the Woodside location. GIE expects to complete negotiations for a lease at a fourth site.

The Project team will continue operation of the batteries from the SGS user interface and evaluate impacts on feeder loads. The Project team will also refine control center operational screens based on feedback from operators.

Dispatch Optimization (Phase 3) is expected to begin with the enrollment of the first asset 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 Project 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: Ability to dispatch through user interface has been demonstrated with one battery.

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 Q1 2020.

2.3 WORK PLAN & BUDGET REVIEW

2.3.1 Phase Review

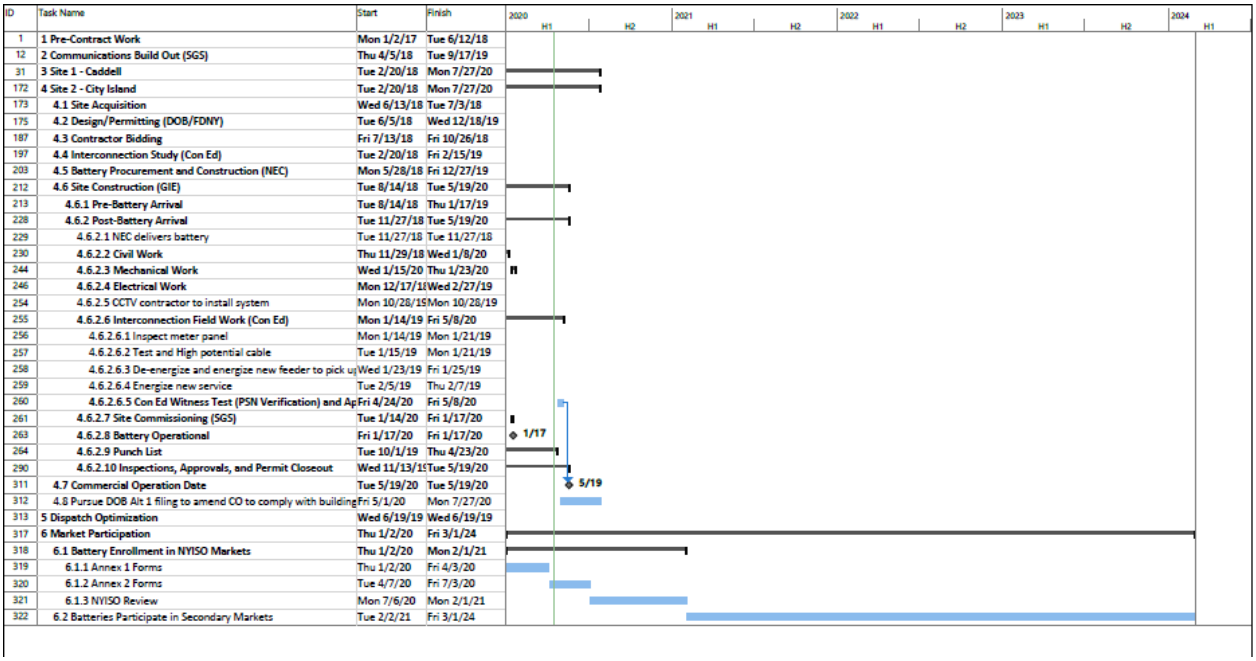
2.3.1.1 Phase Progress

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 Q2 2020 with a negotiated lease on a fourth site. Phase 2 will begin for the fourth site, which is expected to receive permitting approval in Q2 2020.

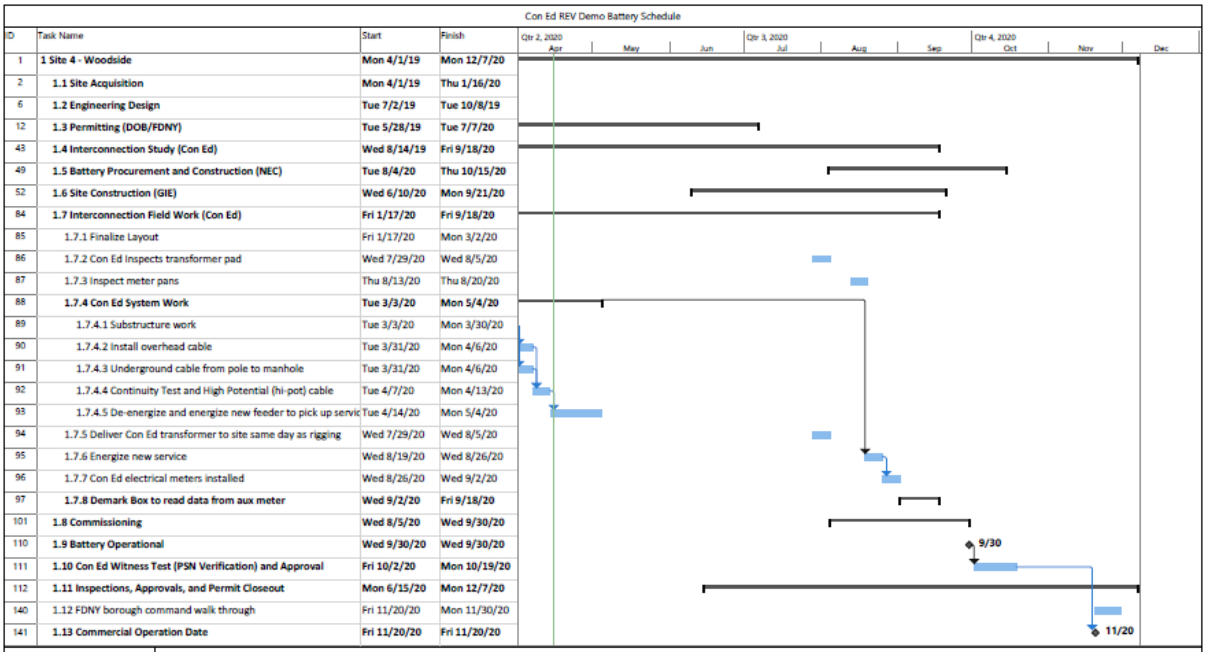
2.3.2 Work Plan

Note: these work plans do not account for delays due to the COVID-19 pandemic, as those are not possible to capture accurately at this time.

Sites 1 & 2:

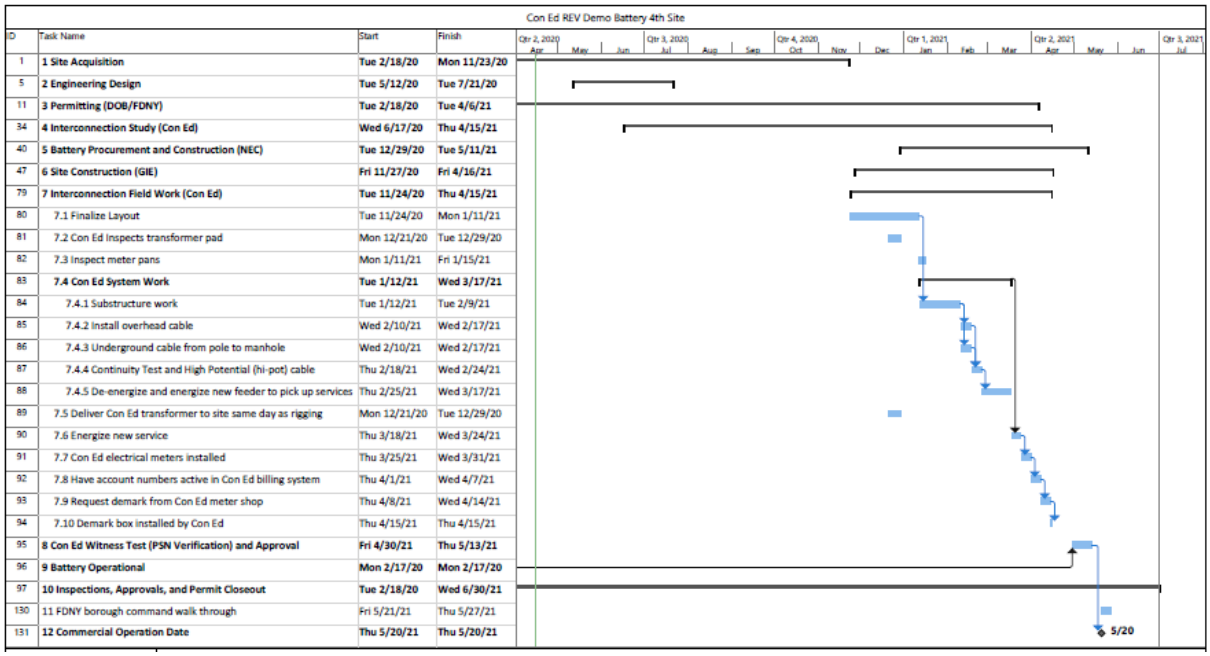


Site 3:



ID	Task Name	Start	Finish
1	**1 Site 4 - Woodside**	**Mon 4/1/19**	**Mon 12/7/20**
2	**1.1 Site Acquisition**	**Mon 4/1/19**	**Thu 1/16/20**
6	**1.2 Engineering Design**	**Tue 7/2/19**	**Tue 10/8/19**
12	**1.3 Permitting (DOB/FDNY)**	**Tue 5/28/19**	**Tue 7/7/20**
43	**1.4 Interconnection Study (Con Ed)**	**Wed 8/14/19**	**Fri 9/18/20**
49	**1.5 Battery Procurement and Construction (NEC)**	**Tue 8/4/20**	**Thu 10/15/20**
52	**1.6 Site Construction (GIE)**	**Wed 6/10/20**	**Mon 9/21/20**
84	**1.7 Interconnection Field Work (Con Ed)**	**Fri 1/17/20**	**Fri 9/18/20**
85	1.7.1 Finalize Layout	Fri 1/17/20	Mon 3/2/20
86	1.7.2 Con Ed Inspects transformer pad	Wed 7/29/20	Wed 8/5/20
87	1.7.3 Inspect meter pans	Thu 8/13/20	Thu 8/20/20
88	**1.7.4 Con Ed System Work**	**Tue 3/3/20**	**Mon 5/4/20**
89	1.7.4.1 Substructure work	Tue 3/3/20	Mon 3/30/20
90	1.7.4.2 Install overhead cable	Tue 3/31/20	Mon 4/6/20
91	1.7.4.3 Underground cable from pole to manhole	Tue 3/31/20	Mon 4/6/20
92	1.7.4.4 Continuity Test and High Potential (hi-pot) cable	Tue 4/7/20	Mon 4/13/20
93	1.7.4.5 De-energize and energize new feeder to pick up servic	Tue 4/14/20	Mon 5/4/20
94	1.7.5 Deliver Con Ed transformer to site same day as rigging	Wed 7/29/20	Wed 8/5/20
95	1.7.6 Energize new service	Wed 8/19/20	Wed 8/26/20
96	1.7.7 Con Ed electrical meters installed	Wed 8/26/20	Wed 9/2/20
97	**1.7.8 Demark Box to read data from aux meter**	**Wed 9/2/20**	**Fri 9/18/20**
101	**1.8 Commissioning**	**Wed 8/5/20**	**Wed 9/30/20**
110	**1.9 Battery Operational**	**Wed 9/30/20**	**Wed 9/30/20**
111	**1.10 Con Ed Witness Test (PSN Verification) and Approval**	**Fri 10/2/20**	**Mon 10/19/20**
112	**1.11 Inspections, Approvals, and Permit Closeout**	**Mon 6/15/20**	**Mon 12/7/20**
140	1.12 FDNY borough command walk through	Fri 11/20/20	Mon 11/30/20
141	**1.13 Commercial Operation Date**	**Fri 11/20/20**	**Fri 11/20/20**

Site 4:



ID	Task Name	Start	Finish
1	**1 Site Acquisition**	**Tue 2/18/20**	**Mon 11/23/20**
5	**2 Engineering Design**	**Tue 5/12/20**	**Tue 7/21/20**
11	**3 Permitting (DOB/FDNY)**	**Tue 2/18/20**	**Tue 4/6/21**
34	**4 Interconnection Study (Con Ed)**	**Wed 6/17/20**	**Thu 4/15/21**
40	**5 Battery Procurement and Construction (NEC)**	**Tue 12/29/20**	**Tue 5/11/21**
47	**6 Site Construction (GIE)**	**Fri 11/27/20**	**Fri 4/16/21**
79	**7 Interconnection Field Work (Con Ed)**	**Tue 11/24/20**	**Thu 4/15/21**
80	7.1 Finalize Layout	Tue 11/24/20	Mon 1/11/21
81	7.2 Con Ed Inspects transformer pad	Mon 12/21/20	Tue 12/29/20
82	7.3 Inspect meter pans	Mon 1/11/21	Fri 1/15/21
83	**7.4 Con Ed System Work**	**Tue 1/12/21**	**Wed 3/17/21**
84	7.4.1 Substructure work	Tue 1/12/21	Tue 2/9/21
85	7.4.2 Install overhead cable	Wed 2/10/21	Wed 2/17/21
86	7.4.3 Underground cable from pole to manhole	Wed 2/10/21	Wed 2/17/21
87	7.4.4 Continuity Test and High Potential (hi-pot) cable	Thu 2/18/21	Wed 2/24/21
88	7.4.5 De-energize and energize new feeder to pick up services	Thu 2/25/21	Wed 3/17/21
89	7.5 Deliver Con Ed transformer to site same day as rigging	Mon 12/21/20	Tue 12/29/20
90	7.6 Energize new service	Thu 3/18/21	Wed 3/24/21
91	7.7 Con Ed electrical meters installed	Thu 3/25/21	Wed 3/31/21
92	7.8 Have account numbers active in Con Ed billing system	Thu 4/1/21	Wed 4/7/21
93	7.9 Request demark from Con Ed meter shop	Thu 4/8/21	Wed 4/14/21
94	7.10 Demark box installed by Con Ed	Thu 4/15/21	Thu 4/15/21
95	**8 Con Ed Witness Test (PSN Verification) and Approval**	**Fri 4/30/21**	**Thu 5/13/21**
96	**9 Battery Operational**	**Mon 2/17/20**	**Mon 2/17/20**
97	**10 Inspections, Approvals, and Permit Closeout**	**Tue 2/18/20**	**Wed 6/30/21**
130	11 FDNY borough command walk through	Fri 5/21/21	Thu 5/27/21
131	**12 Commercial Operation Date**	**Thu 5/20/21**	**Thu 5/20/21**

2.3.3 Updated Budget

As noted above, budget information is being filed confidentially with the Commission.

2.4 CONCLUSION

2.4.1 Lessons Learned

The Project team was successful in identifying nearly 150 percent of the customer identification targets and successfully converted these leads to meet the viable site goal. However, the Project team encountered delays and difficulties in completing a site lease with New York City Department of Citywide Administrative Services ("DCAS"), the owner for the DSNY project site. While the Project 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 may provide many beneficial sites for future storage projects. In addition, site leases are anecdotally becoming more competitive as more storage companies enter the market.

The DOB issued a bulletin on zoning treatment for "non-accessory" battery sites in Q3 2019. This bulletin clarified the zoning treatment for FTM 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 DOB coordination between plan reviews and Office of Technical Certification and Research ("OTCR") approvals can still be inconsistent in terms of sequencing. GIE is coordinating closely with both offices. The new peer review requirement is an example of an unpredictable permitting process that was implemented midstream and will cause Project delays.

Battery warranty restrictions on number of hours at a higher state of charge can limit operations of an asset that is intended to mitigate later evening peak loads. The Project team will evaluate how to optimize warranty restrictions, tariff impacts of charging times, and local grid needs.

The Project 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 the 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 will be a test case for Q3 2020 battery aggregation rules. This collaboration will benefit not only the Project, but also enable the creation of a battery market in New York.

2.4.2 Recommendations

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

2.5 INCLUDED APPENDICES

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

Appendix A: Commercial Battery Storage Description of Phases

APPENDIX B: COMMERCIAL BATTERY STORAGE REV DEMO PROJECT

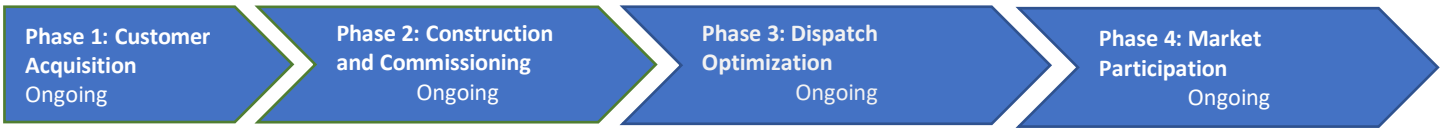
Appendix A: Commercial Battery Storage Description of Phases

Phase	0. Project Planning	1. Customer Acquisition	2. Construction / Commissioning and Integration	3. Dispatch Optimization	4. Market Participation
Milestone (Stage Gate to Next Phase)	*Negotiations to be Completed* • DPS approval • Partner contracts signed	*Successfully execute leases for four customer sites* • Final site selection • Execute customer lease contracts	*Install and commission 4.2 MW/4.4 MWh* • Design approval • Obtain permits • Battery installation • System commissioning	*Dispatch for load relief* • Cyber-secure communication architecture • HMI functionality • Established NOC	*Assets participate in wholesale markets* • Earn revenues in all market products available for battery participation
Key Elements	• Letter of No Objection • Developer contracted • Third-party financing identified and contracted	• Customer lead identification • Complete site Walkthroughs • Complete viable site identification • Final site selection • Market analysis for FTM vs. BTM	• Interconnection and civil design • Interconnection application and study • Permitting • Communications integration • System testing and training	• Assets can be dispatched individually or in aggregate by each party • Fully integrated into SCADA with HMI functionality • Calculate T&D benefit values	• Enroll in NYISO markets allowed today • Continue participation in DER roadmap proceedings to increase participation for ELRs • Quantify market revenues achievable under stacked value model
DER Categories	N/A	N/A	• Battery Storage	• Battery Storage • DER Aggregation	• Battery Storage • DER Aggregation

Appendix B: 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
Q1 2020 Spend: *Filed Confidentially*
Cumulative Spend: *Filed Confidentially*



Lessons Learned: Customers

- Engagement with the City is ongoing and important to find potential resolution for future projects.
- 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 is a test case for Q3 2020 battery aggregation rules. 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
- Warranty restrictions need to be balanced with operational needs and use cases.

Application of Lessons Learned: *TBD based on City engagement and NYISO collaboration. Zoning considered carefully during site acquisition.*

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 Q4 2020.*

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

Recent Milestones: *a) Caddell site is operational b) City Island completed majority of commissioning c) Woodside working through new DOB requirement d) Caddell dispatching began) NYISO communications hardware issue resolved*

Upcoming Milestones: *First 2 sites operational. Negotiate 4th site lease. Begin construction on 3rd site. Refine control center screens. Enroll two assets in NYISO pilot program.*