

## **Reforming the Energy Vision**

Demonstration Project Q4 2018 Report

---

# **Aggregated Behind the Meter Energy Storage**



**Table of Contents**

- 1.0 Executive Summary..... 3
- 2.0 Demonstration Highlights since the Previous Quarter ..... 4
  - 2.1 Activity Overview ..... 4
    - 2.1.1 Engineering Drawing Completion ..... 4
    - 2.1.2 Site Construction Completion ..... 4
    - 2.1.3 Delivery and Installation of Battery Systems ..... 4
    - 2.1.4 Testing and Commissioning of all Site Equipment..... 4
  - 2.2 Metrics and Checkpoints..... 5
  - 2.3 Issues..... 5
- 3.0 Work Plan..... 7
  - 3.1 Budget Review ..... 7
  - 3.2 Updated Work Plan..... 7
  - 3.3 Next Quarter Planned Activities ..... 8
- 4.0 Conclusion / Lessons Learned ..... 9

## 1.0 Executive Summary

New York State Gas & Electric Corporation (NYSEG or the Company) submits this quarterly report on the progress of the Aggregated Behind the Meter Energy Storage Demonstration Project (Aggregated BTM ES Project).

The project involves partnering with a third party to install a mixture of small (~53 kW), medium (~159 kW), and large (~265 kW) battery installations for a range of commercial and industrial customers within the footprint of the Energy Smart Community (“ESC”) located in the Ithaca, NY region. NYSEG aims to enroll and aggregate up to eight (8) customers in the battery storage offering, with a total capacity of approximately 1.060 MW and 4.2 MWh. NYSEG will also work with the third party partner to provide the software to aggregate and dispatch the installed batteries. The aggregation software will allow the batteries to participate in the NYISO Special Case Resources demand response (“DR”) program and be dispatched by NYSEG to manage system constraints.

The Aggregated BTM ES Project will demonstrate some of the value streams that can be leveraged in parallel by behind the meter battery storage and attempt to identify new value streams that can be added. This pilot will also evaluate potential alternative rate designs and their impact on the value proposition of aggregated BTM battery storage.

The Aggregated BTM ES Project execution will be accomplished in three phases: (1) Customer Acquisition, (2) System Installation, and (3) Hypothesis Validation and Reporting. The Project is anticipated to take approximately forty-three months from project development to closeout which includes customer acquisition, site selection, construction, and commissioning of the battery systems as well as the validation and testing of the hypothesis, use case functionality and final analysis.

During Q4 2018, the project focus has been site construction, battery storage installation, acceptance testing, and commissioning. Two individual behind the meter battery systems, both sized at 159 kW/630 kWh, have been deployed and placed into service at the respective customer locations.

Plans for Q1 2019 include:

- Completion of all punch list items at the two customer sites in service
- Development of use case process and procedures
- Data collection on battery performance at the two customer sites in service
- Finalization of Vendor aggregation contract and process
- Finalization of customer contracts for additional customer sites
- Begin preliminary Engineering for new customer sites

The following report provides a progress update on the tasks, milestones, checkpoints, and lessons learned to date.

## 2.0 Demonstration Highlights since the Previous Quarter

### 2.1 Activity Overview

Activity completed and results up to the end of December or Q4, 2018 included:

- Completion of Engineering Drawings
- Completion of site construction for two initial customers
- Delivery and installation of two customer battery storage systems
- Testing and commissioning of all associated site equipment

#### 2.1.1 Engineering Drawing Completion

Engineering Drawings were completed on 10/15/2018 for customer site #1 and 11/02/2018 for customer site #2.

#### 2.1.2 Site Construction Completion

##### Customer #1:

The majority of site construction was completed by 12/13/2018 with weather causing the site restoration and grass planting to occur in the Spring of 2019. There are a few remaining construction punch lists to be completed which will continue into early 2019.

##### Customer #2:

The majority of site construction was completed by 12/16/2018 with weather causing the site restoration and grass planting to occur in the Spring of 2019. Decorative fencing, requested by customer, will be completed in 2019. There are a few remaining construction punch lists to be completed which will continue into early 2019.

#### 2.1.3 Delivery and Installation of Battery Systems

The batteries were delivered on 11/26/2018 and installed on 12/04/2018 for customer #1. The batteries were delivered on 11/26/2018 and installed on 12/07/2018 for customer #2.

#### 2.1.4 Testing and Commissioning of all Site Equipment

Testing and commissioning of the battery and equipment was completed by 12/31/2018 with fire alarm testing and commissioning completed by 12/14/2018 for both Customer #1 and Customer #2.

## 2.2 Metrics and Checkpoints

The Aggregated BTM ES Project is completing the Phase II – “System Installation” as defined in the Implementation Plan. The Customer Acquisition metric is the only metric and checkpoint identified to be tracked during Phase I and Phase II of the demonstration project and is shown below. The remaining Metrics and Checkpoints will be captured as part of the Phase III – Hypothesis Validation and Reporting portion of the project.

### Phase I - Metrics and Checkpoints

Metric	Definition	Target	Current Results
Customer Acquisition	The total number of participating customers in the Project	8	7

In order to enroll additional customers NYSEG will continue the customer recruitment process until the end of Q1 2019.

### Phase II - Metrics and Checkpoints

Metric	Definition	Target	Current Results
System Installation (2018)	Installing Batteries behind the meter at customer sites, testing, and commissioning in 2018	2	2
System Installation (2019)	Installing Batteries behind the meter at customer sites, testing, and commissioning in 2019	6	0

## 2.3 Issues

We have encountered a few issues so far during implementation of “Phase 2- Execute” and “Phase 2: Plan”. Lessons learned are included below:

### Phase 2 - Plan

- Standards for battery installation specifications are still developing nationally and locally. Utility needs to include batteries in their standards such as existing operations manual, communications document, and design specifications.
- It is difficult to reduce the schedule based on standard review and approval processes with set timeframes by the stakeholders.

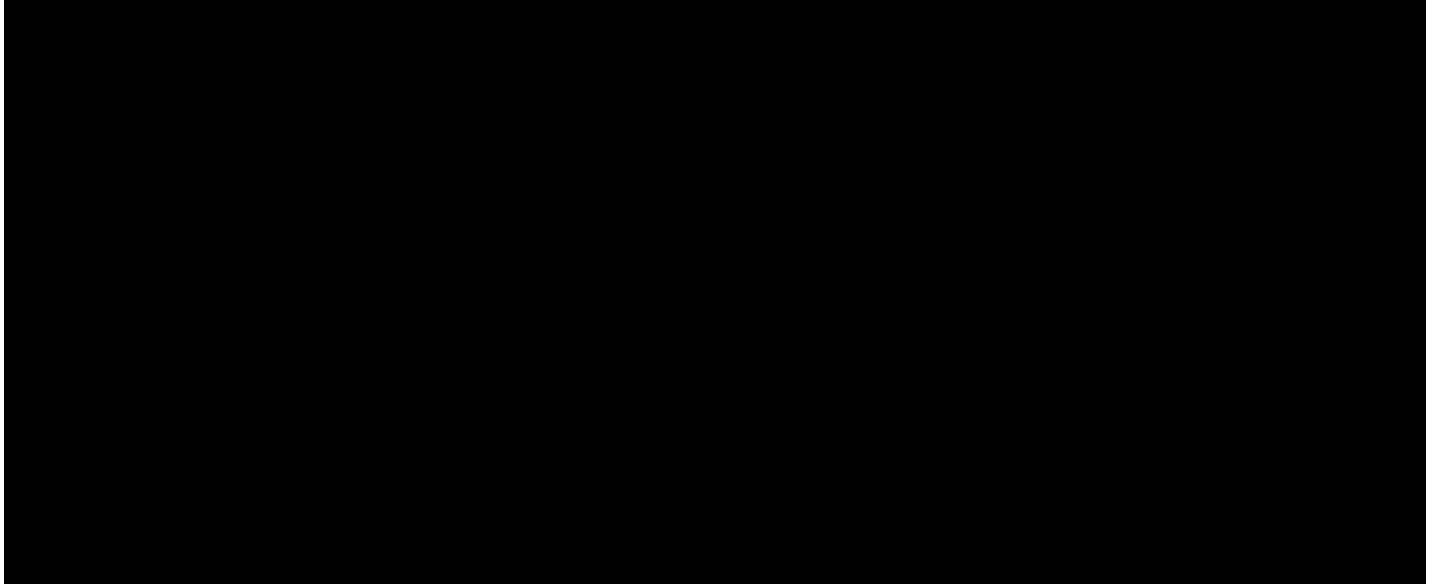
- Customer wants input in the design and approval of drawings and has their own review process.
- Informing and educating stakeholders about the battery and projects prior to needing their approval is a good practice.
- Fire Alarm and Prevention Battery standard still in development, which led to design challenges at customer sites.

#### Phase 2 - Execute

- Stakeholder resource availability in order to get completion approvals over the holidays is difficult with other priorities.
- Coordinate outages with customer and provide plenty of notice, so they can plan and provide the day and time that has minimal impact to their business.
- Communication and regular status meetings between all stakeholders was beneficial for updates and getting quick responses.

## 3.0 Work Plan

### 3.1 Budget Review



### 3.2 Updated Work Plan

Milestone	Description	Date	Status Update
Phase 1 - Initiate	Develop Business Model for Demonstration	October 2017 - March 2018	Completed
Phase 1 - Plan	Review Customer Load Profile Data, Develop targeted customer list, and Create Demonstration Agreement	December 2017-April 2018	Completed
Phase 1 - Execute	Meet with Targeted Customers to Determine Interest and Constructability	April - July 2018	Complete
Phase 1 - Closeout	Sign up Participating Customers	June - September 2018	March 2019
Phase 2 - Initiate	Vendors Selected and Kick Off Meeting	June 2018	Completed
Phase 2 - Plan	Engineering and Procuring Equipment	July 2018-April 2019	Completed 2 Sites 2018, January 2019 – October 2019
Phase 2 - Execute	Construction and Testing	October 2018 - May 2019	Completed 2 Sites 2018), September-November 2019
Phase 2 -	Commissioning and Turnover	December 2018,	Commissioning

Closeout		June 2019	Completed December 2018 and Closeout on-going, Other 6 sites November 2019
Phase 3 - Initiate	Review Metrics and Information Gathering	September 2018	Completed
Phase 3 - Plan	Develop Test Plan and Determine Roles & Responsibility	October - December 2018	On-going
Phase 3 - Execute	Hypothesis Validation and Data Collection	January 2019 – April 2021	January 2019 – November 2021
Phase 3 - Closeout	Results and Report Creation, Scalability Analysis, Demonstration Project Completion	January 2021 - April 2021	January 2021 - November 2021

### 3.3 Next Quarter Planned Activities

In Q1 2019, the project team aims to complete the following tasks:

- Phase 1 - Initiate
  - One Customer to sign Preliminary Agreement by 02/28/2019 to proceed to engineering
- Phase 2 - Plan
  - Complete sub-contracts with vendor 5 new customer sites by 03/29/2019 to begin preliminary engineering by April.
  - Complete Vendor Aggregation contracts by 03/29/2019
- Phase 2 – Closeout
  - Complete remaining punch list items at the two customer sites by 02/01/2019
- Phase 3 – Execute
  - Development and finalization of use case process and procedures by 02/28/19
  - Data collection on battery performance at the two customer sites in service – ongoing



## 4.0 Conclusion / Lessons Learned

In conclusion, we have learned this is a very aggressive schedule for signing up customers, engineering, completing the interconnection process, permitting, and constructing the battery system at the customer sites. We have learned the standards for battery installation are evolving and forming nationally, and as a utility, we need to begin incorporating these standards into our processes. As standards change, we need to adapt and respond. Implementing a battery storage team from engineering, communications, fire prevention, and operations is recommended to stay informed and up to date on the technology and how to respond. The team would discuss issues involved in the standards to determine the best utility practice as we learn about the new technology. In addition, battery developers are also learning about New York specific standards and permitting requirements to deliver on customer BTM sites including the continued development of use cases. Also, due to more rain than average in the fall impacted some of the soil conditions of the project that changed some of the geotechnical report recommendations. Fortunately, these customer site locations did not have any changes to the civil construction design. Lastly, resources are always minimal during the holidays and can impact an aggressive timeline due at the end of the year.

We have also learned that commercial and industrial customers are generally eager to adopt behind-the-meter battery storage under a shared guaranteed savings model with utility ownership. The only factor adversely affecting customer willingness to participate under this model is lack of space or other constructability issues. This would seem to indicate that alternative solutions might be needed to address the use cases targeted under this demonstration project in urban areas like the City of Ithaca.