Karla M. Corpus
Senior Counsel
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October 31, 2017

VIA ELECTRONIC DELIVERY

Honorable Kathleen H. Burgess
Secretary
New York State Public Service Commission
Three Empire State Plaza, 19th Floor
Albany, New York 12223-1350

RE: Case 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision (REV)

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID: COMMUNITY RESILIENCE REV DEMONSTRATION PROJECT – Q3 2017 REPORT

Dear Secretary Burgess:

Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid") hereby submits for filing its quarterly update to the Community Resilience REV Demonstration Project Implementation Plan covering the period of July 1, 2017 through September 30, 2017 ("Q3 Report") as required by the REV Demonstration Project Assessment Report filed by the New York State Department of Public Service Staff ("Staff") with the Commission on February 10, 2016 in Case 14-M-0101.

Please direct any questions regarding this filing to:

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National Grid looks forward to continuing to work collaboratively with Staff as it proceeds with the implementation of the Community Resilience REV Demonstration Project.

Respectfully submitted,

/s/ Karla M. Corpus

Karla M. Corpus
Senior Counsel

Enc.

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Community Resilience

REV Demonstration Project

Potsdam, New York

Q3 2017 Report

October 31, 2017

Table of Content

1.0 Executive Summary

Under the New York Public Service Commission's ("PSC") Reforming the Energy Vision ("REV") proceeding, this Community Resilience Demonstration Project (the "Project") focuses on improving the local resiliency during severe weather events in the remote Village of Potsdam ("Potsdam") in upstate New York with the creation of a community microgrid. Potsdam and surrounding St. Lawrence County have experienced a number of multi-day power outages as a result of microbursts and winter ice storms; most notably the "Ice Storm of 1998" which left over 100,000 customers without power for up to 3 weeks in the North Country and recently, in December of 2013, another ice storm isolated over 80,000 customers for days.

Image 1.1 – Photo of Upstate New York after the 1998 Ice Storm[1]

Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") has partnered with Clarkson University in order to develop a community resilience microgrid for Potsdam with an underground distribution network and coordination of new and existing distributed energy resources ("DER"), including natural gas generators, hydroelectric generators, and a large photovoltaic ("PV") solar array. Essential infrastructure that needs to remain operational during prolonged power grid outages and which will be connected to the microgrid include a hospital, the local police and fire departments, water and wastewater treatment plants, Village of Potsdam government offices, two (2) higher education institutions, a high school, a bank, a drug store, a grocery store, and a gas station. The Project aims to develop a new economic model for community microgrid projects and involves hybrid ownership of assets between the utility and customers, as well as a unique tiered tariff design that recovers the cost of the assets from the community that benefits from the microgrid.

[1] Image was taken during the aftermath of 1998 Ice Storm.

Concurrently, the Company will develop and test new utility services that may be required for further microgrid deployment in New York State.

The four services to be developed and tested are:

1. Tiered recovery for storm-hardened, underground wires;
2. Central procurement for DER;
3. Microgrid control and operations; and
4. Billing and financial services.

While National Grid is leading the Project, this demonstration is actually a close-knit partnership effort between Clarkson University ("Clarkson") and National Grid. Moreover, it will require significant input from other major Potsdam stakeholders, such as the Village of Potsdam government, the Canton-Potsdam Hospital, and the State University of New York at Potsdam ("SUNY Potsdam").

Image 1.2 – The major stakeholder partners of the Community Resilience demonstration (clockwise, from top left: Clarkson University, SUNY Potsdam, Village of Potsdam Offices, Canton-Potsdam Hospital)

During the third quarter of 2017 the National Grid Project team continued the major efforts of the Detailed Engineering Design and Financial and Business Plan phase (Phase 2) of the Project. The majority of the activities during Q3 2017 focused on the engineering analysis and financial analysis refinement. Additionally, some report writing was also conducted for tasks paralleling New York State Energy Research & Development Authority's ("NYSERDA"'s) NY Prize Stage 2 Scope of Work ("SOW"). The Project team, including partners GE Energy Consulting ("GE"), OBG (formerly O'Brien and Gere), Nova Energy Specialists, LLC ("Nova Energy"), and Clarkson University, met regularly to

discuss the status of each partner's responsibilities and progress Phase 2. Other Q3 2017 activities involved continued business model exploration, adjustments to the tiered recovery model and exploration of its effect on the financial analysis based on a proposed staged roll-out of the microgrid.

2.0 Highlights Since Previous Quarter

National Grid and the key Project partners have made steady progress in Q3 2017, including determining the initial microgrid size and refining the estimate of additional generation required for the Project to move forward. Figure 1-1 provides a reference timeline for 2017-2018 emphasizing the major milestones and accomplishments to date. Changes and additions are highlighted in yellow and are described in additional detail in Section 3.1 below.

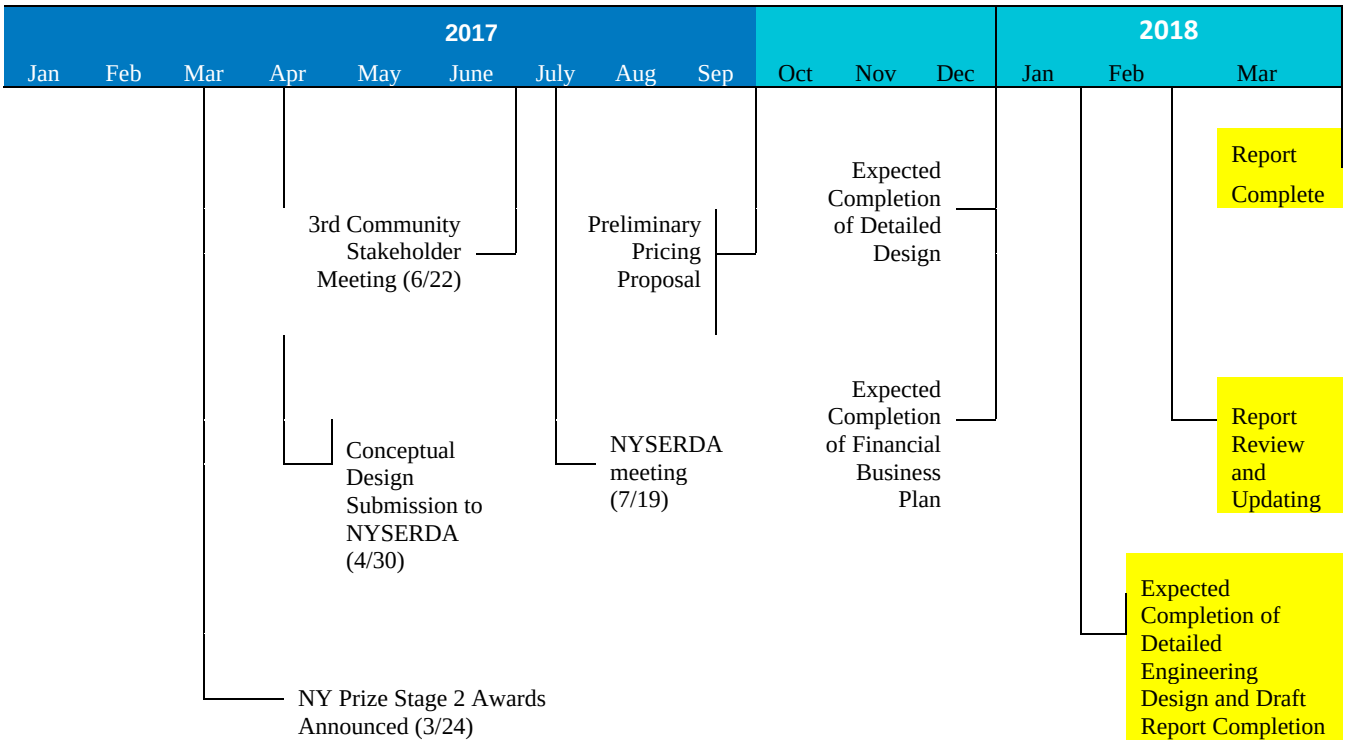

Figure 1.1 –2017-2018 Major Milestones Timeline

2.1 Major Task Activities

1. **Stage 2 Report Preparation**
   Drafting of report sections continued, with a focus on Task 1 sections, Microgrid Configuration and Design (Task 1.2) and the Distributed Energy Resource Analysis (Task 1.4). Much of the text for the Value Proposition (Task 2.4) and for External Support (Task 2.5) was also prepared.

2. **DER-CAM Analysis**
   The Distributed Energy Resources Customer Adoption Model ("DER-CAM")[2] is an economic, energy balance, and environmental model that is used for determining

[2] *See* Distributed Energy Resources Customer Adoption Model ("DER-CAM"), available at: https://building-microgrid.lbl.gov/projects/der-cam.

optimum sizing of DER assets in grid-connected and off-grid microgrid systems. A more detailed description of the DER-CAM model is provided in the Q2 2017 Project report.

Refined DER-CAM Results

This quarter, the preliminary DER-CAM analysis was refined using updated customer information inputs to better determine the appropriate size of additional DER needed to provide adequate generation for the Potsdam microgrid during prolonged outages. Included in this adjustment was the fine-tuning of OBG's energy conservation measures ("ECM") and demand response ("DR") assumptions that reduced the number of hours that the microgrid could execute these programs, based on industry performance standards. The simple payback period of most ECMs was determined to be sufficient enough to make implementation financially attractive.

In Phase 1 of the Project the preliminary DER-CAM analysis determined 4,000 kW of additional generation would be required to meet the full microgrid load. This estimate assumed renewable DER would be available, which, for planning purposes, was later determined to be unavailable. Additionally, the analysis was based on load profile estimates rather than actual data. Refining the data and assumptions indicated that 4,300 kW of additional generation is required to meet the full microgrid load.

Additional DER-CAM analyses were performed to determine the amount of DER needed considering the reduced geographic footprint of the microgrid noted below. Different pricing scenarios for grid-connected (normal days / blue sky conditions) and islanded (emergency/outage periods) modes were also evaluated.

Based on research conducted this quarter regarding the PSC's Value of Distributed Energy Resources ("VDER") proceeding,[3] the Project team has preliminarily determined that adding fuel cells may be more financially beneficial than adding natural gas-fired reciprocating generator, as a non-residential fuel cell sized greater than 10 kW up to 2 MW is eligible for VDER Phase One Value Stack compensation.. The Project team will continue to evaluate and adapt the list of eligible technologies.

Both of the Village of Potsdam's hydroelectric plants, as well as Clarkson's solar PV plant, are compensated under traditional net energy metering ("NEM")' they receive monetary credits for the net power produced based on the sum of all kWh cost factors for their respective location. Any arrangement for the microgrid to sell or otherwise monetize the output of these three (3) generating facilities will impact current NEM arrangements. The West Dam hydroelectric facility and the solar PV facility will likely be negatively impacted because the microgrid would likely sell power at or near market prices, whereas the current NEM credits are paying a significantly higher amount. The East Dam hydroelectric facility, were it running, would receive a higher price for its power, but not as much as the West Dam and the solar PV. The reason for this is the East Dam is served under SC-3, which is based on few other factors besides kWh price. The West Dam and the solar PV are both served by SC-2, so their kWh price includes several other factors besides commodity price.

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[3] *See* Case 15-E-0751 *et al*., *In the Matter of the Value of Distributed Energy Resources* ("VDER Proceeding") *et al.*, Order on Phase One Value of Distributed Energy Resources Implementation Proposals, Cost Mitigation Issues, and Related Matters (issued September 14, 2017)("VDER Phase One Order").

3. Microgrid Configuration and Design

Staged Roll-out

As noted in the Q2 2017 report, while the originally-envisioned community microgrid footprint involved supporting all critical services in the Town of Potsdam, the cost of the full microgrid was determined to be economically infeasible and a staged approach to microgrid construction subsequently developed. In Q3 2017, the decision was made by team members to adopt the staged roll-out approach, with Stages 1, 1b, and 2 all being constructed under Stage 1; also termed 'the smaller footprint.' This approach allows the construction investment to occur over an extended period of time. Once selected, this decision was communicated to all members of the Project Team so that they could proceed with their tasks accordingly.

Data in Table 2.1 below describes the staged approach, while Figure 2.3 that follows provides a geographic location of each stage.

Stage	Start/Finish Point	Route (Streets)	Load Connections	Generation Connections
Stage 1	Clarkson University (feeder 51) to Village Civic Center	Maple St. -> Main St.	Clarkson University, Kinney Drug Store, Stewart's Shops Gas Station, The Clarkson Inn, North Country Savings Bank, IGA Grocery, Civic Center/Rescue Squad	West Dam Hydro
Stage 1b	Maple St. to East Dam Hydro	Market St. -> Raymond St.	Stage 1 + Water Treatment Plant	West Dam Hydro + East Dam Hydro
Stage 2	Village Civic Center to Canton-Potsdam Hospital ("CPH")	Park St. -> Elm St. -> Lawrence Ave. -> Leroy St.	Stage 1 + Potsdam High School and CPH	West Dam Hydro + East Dam Hydro
Stage 3	CPH to Wastewater Treatment Plant	Grove St. -> Cherry St. -> Lower Cherry St.	Stage 2 + Wastewater Treatment Plant	West Dam Hydro + East Dam Hydro
Stage 4	Village Civic Center to SUNY Potsdam	Main St. -> SUNY at Morningside Dr.	Stage 3 + SUNY Potsdam	West Dam Hydro + East Dam Hydro + SUNY CHPs
Stage 5	SUNY Potsdam to solar PV via overhead line	Morningside Dr. -> Elm St.	Stage 4 + PV	West Dam Hydro + East Dam Hydro + SUNY CHPs + PV
Stage 6	Clarkson to National Grid Service Center	Pine St.	Stage 5 + National Grid Service Center	West Dam Hydro + East Dam Hydro + SUNY CHPs + PV

Table 2.1 – Staged Roll-Out Approach

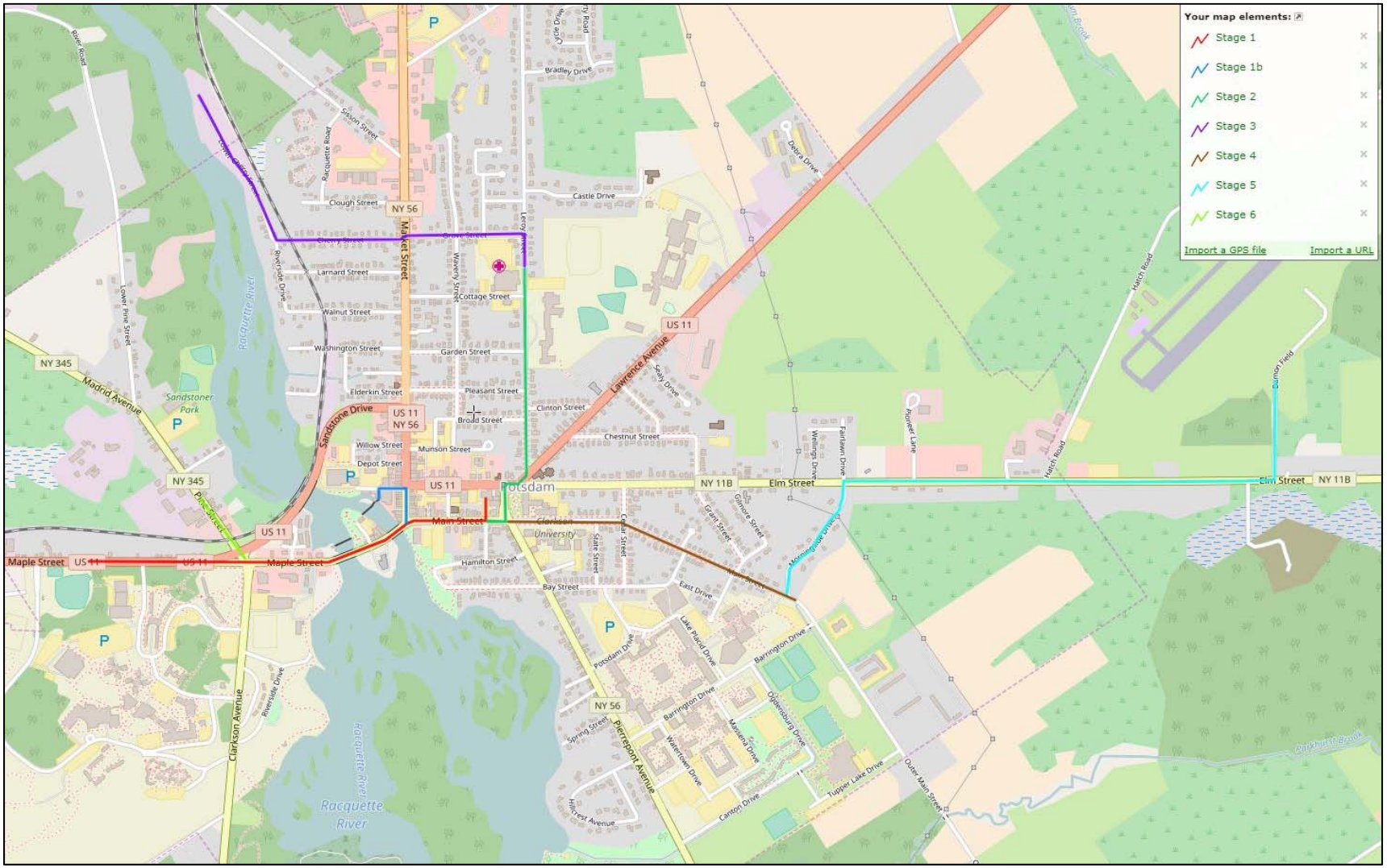

Figure 2.3 – Staged Roll-Out Approach Map

Engineering Design of Staged Roll-out
One-line diagrams for the large (full build-out) microgrid and small footprint (staged approach footprint through Stage 2) microgrid were developed during Q3 2017. Subsequently, based on the small footprint selection, GE Grid Automation made progress on developing the microgrid controller and communications design. Working with Nova Energy, GE also initiated work on power distribution system modeling and simulation, while continuing their analysis of harmonics and flicker.

Cost Estimates of Staged Roll-out
With the establishment of the six (6) stages, the Project team next prepared an approximate cost estimate of each stage. This included more precise estimates of duct and cable footage, number of manholes and switchgear, and labor costs. A more detailed cost estimate for constructing the Project's small footprint through Stage 2 only (*i.e.,* Stages 1, 1b, and 2) and a cost estimate for constructing the entire microgrid were prepared. Construction of the smaller footprint would cost approximately$8.79M. The larger microgrid would cost approximately 35% more (*i.e.,* approximately $13.465M).[4]

4. Customer Base - Tiered Recovery
The Project team developed two (2) detailed cost estimates for the smaller foot print microgrid (Stages 1, 1b and 2). One is based on installing an enhanced breaker design, costing $13.46M, while the other estimate was based on installing a standard design, costing $8.79M. The enhanced design uses a highly robust system of breakers and switches. A benefit-cost analysis was started in Q3 2017 to determine the benefit of the additional breakers. Additionally, a one-line drawing was developed to be used in an analysis to determine if additional breakers are necessary for the microgrid to be energized in sections rather than all at once during the start of an islanding event. Findings of both of these analyses will be provided in the Q4 2017 report.

Tables 2.2 and 2.3, below display the potential bill increase figures by customer class resulting from constructing Stages 1, 1b, and 2, using the higher and lower cost estimates, respectively. Note these costs are only for the distribution network and controller; they do not include additional DER or the controller. A cost recovery approach for additional generation has not yet been determined.

[4] These costs could decrease if any funding were awarded through external sources, such as the NY Prize Stage 3.

Customer Tier	Monthly Customer Bill Impacts					
	Residential	*Small Commercial Non-Demand*	*Small Commercial Demand*	*Large Commercial Primary*	*Large Commercial Transmission*	**AVG**
Tier 1a	N/A	N/A	8.33%	13.32%	5.65%	11.57%
Tier 1b	N/A	N/A	9.49%	12.52%	N/A	10.63%
Tier 2	4.95%	4.98%	7.42%	11.30%	N/A	7.16%
Tier 3	4.20%	4.24%	5.29%	7.47%	6.69%	5.58%
Tier 4	3.76%	3.78%	4.86%	4.13%	N/A	4.13%
Tier 5	2.11%	2.12%	2.82%	3.55%	4.70%	3.06%

[1] *Tier 1a and 1b represent delivery only bill impact figures, while the other tiers represent total bill impact figures.*

Table 2.2 – Customer Monthly Bill Impact Percentages Based on Constructing Stage 1, 1b, and 2 Using the Highly Robust Circuit Breaker and Switchgear Approach

Customer Tier	Monthly Customer Bill Impacts					
	Residential	*Small Commercial Non-Demand*	*Small Commercial Demand*	*Large Commercial Primary*	*Large Commercial Transmission*	**AVG**
Tier 1a	N/A	N/A	5.44%	8.70%	3.69%	7.55%
Tier 1b	N/A	N/A	6.20%	8.17%	N/A	6.94%
Tier 2	3.23%	3.25%	4.84%	7.37%	N/A	4.67%
Tier 3	2.75%	2.77%	3.46%	4.87%	4.37%	3.64%
Tier 4	2.46%	2.47%	3.17%	2.70%	N/A	2.70%
Tier 5	1.38%	1.39%	1.84%	2.32%	3.07%	2.00%

[1] *Tier 1a and 1b represent delivery only bill impact figures, while the other tiers represent total bill impact figures.*

Table 2.3 – Customer Monthly Bill Impact Percentages Based on Constructing Stage 1, 1b, and 2 Using the Basic Circuit Breaker and Switchgear Approach

5. Financial Model Development

Critical to the Project's value proposition is National Grid's preliminary pricing proposal, currently under refinement now that the staged roll-out approach has been selected. The preliminary pricing proposal will provide the Company the opportunity to explain the pricing of each of the four (4) proposed services to Project partners and stakeholders. The final version of the tiered recovery of the underground wires network will also be included.

Natural gas pricing data was collected from SUNY Potsdam and Clarkson to evaluate the rates they are charged for natural gas by St. Lawrence Gas, the local distribution company. There was a concern that St. Lawrence Gas sells gas at a different rate to

customers using combined heat and power ("CHP") use than what it charges customers using gas for heating. Customer bill data comparisons indicated that the CHP rate was not applied to gas sales at SUNY Potsdam, which owns two CHPs. Verifying this is important to the Project because the gas/fuel price is a critical factor in determining when it is financially advantageous to operate the CHP units.

2.2 Challenges, Changes, and Lessons Learned

The following issues or changes occurred during Q3 2017.

Qtr. 2017	Issue or Change	What was the resulting change to Project scope/timeline?	Strategies to resolve	Lessons Learned
Q3	Change in Project leadership	Arun Vedhathiri replaced Carlos Nouel as Project Sponsor, effective 8/24/17.	Transition plan developed by Project Manager to acquaint new Sponsor with the Project.	Frequent outreach by the Project Manager to new Sponsor, and inclusion of Sponsor on monthly team calls, is an effective way to quickly acquaint a new Sponsor with the Project.
Q3	Although they offer a low equipment unit cost, natural-gas fired electric reciprocating generators may not be the best choice for use in the Project, as they are not entitled to VDER Phase One Value Stack compensation.[5]	A relatively low cost of construction may not determine whether a certain type of on-site generation will be the best long-term choice financially.	The Project team is exploring the potential use of fuel cells and other generation sources, which are eligible to receive VDER Phase One compensation.	While initial capital cost may be attractive for a particular DER, one must also evaluate the DER in the context of regulatory proceedings.

[5] VDER Proceeding, *supra* note 3.

3.0 Next Quarter Forecast

In the fourth quarter of 2017, the Project team will continue its efforts on the business modeling and detailed engineering design with its partners using the NYSERDA NY Prize SOW as a guide. Detailed explanations of the proposed provisions of the microgrid, such as fuel specifications, current generation sources, future generation needs, as well as other general information, will be documented for the NY Prize Stage 3 RFP response.

Outreach to Tier 1 and 1a Project stakeholders will be conducted to apprise them of the decision to initially use the smaller staged construction approach (*i.e.*, Stages 1, 1b and 2). In addition, stakeholder outreach to customers that will not be included in the initial construction, despite previously committing to the Project, will continue, as they will be added should future microgrid stages are constructed.

Adjustments to the Phase 1 assumptions and calculations will be made based on the smaller microgrid footprint.

Cost estimate adjustments based on the staged construction configuration will continue. This includes estimated duct and cable footage, number of manholes and switchgear, and labor costs. There are three (3) configurations of breakers and switches currently under evaluation; they vary in cost and level of robustness they offer to the overall microgrid. A final breaker and switchgear configuration will be selected based on, both the breaker requirements needed for the microgrid's cutover to islanding mode, as well as the benefit/cost of the robustness degree needed for grid operation during island mode. Both the benefit/cost analysis and islanding breaker requirement determination will be completed in Q4 2017.

The Project team will continue to work on the business and governance model based on the initial construction consisting only of the Stage 1, 1b, and 2 to present a clear and compelling case that the benefits to the community, stakeholders, and utility outweigh associated costs and risks.

Report writing tasks will continue, focused on subsections with in Section 2, which discussed the finance and business models.

3.1 Checkpoints/Milestone Progress

	Checkpoint/Milestone	Anticipated Start-End Date	Revised Start-End Date	Status
1	Clarkson University NYSERDA PON Study *(Conceptual Design)*	10/2015 – 6/30/16	10/2015 – 10/31/16	Complete
2	Initial Engineering Design Recovery Plan *(Tiered Recovery Plan)*	4/6/2016 – 7/26/16	5/1/2016 – 9/30/16	Complete
3	Preliminary Service Proposal & Pricing *(Pricing Proposal)*	7/01/16 – 11/01/16	11/01/16 – 12/15/17	Ongoing
4	Phase 2 Completion *(Detailed Engineering Design and Business Plan)*	3/16/16 – 6/30/17	10/1/16 – 3/31/17	Ongoing

Key

- On-Track
- Delayed start, at risk of on-time completion, or over-budget
- Terminated/abandoned checkpoint

1. Clarkson University NYSERDA PON Study – Task 4 *(Conceptual Design)*

Status: ● - Complete
Start Date: 10/2015
End Date: 10/31/16

Given all research tasks associated with the NYSERDA study are now compete, the Project team considers this Conceptual Design checkpoint complete. The Clarkson team completed the final Report on April 30, 2017. A final close-out meeting with NYSERDA was held on July 19, 2017.

2. Initial Engineering Design Recovery Plan *(Tiered Recovery Plan)*

Status: ● - Complete
Start Date: 5/1/16
End Date: 9/30/16

While continued adjustments of the microgrid design will ultimately affect the results of the tiered recovery, the approach and design of the recovery mechanism is not expected to change during the Project. Therefore, the Project team considers this checkpoint complete.

3. Preliminary Service Proposal and Pricing *(Pricing Proposal)*

Status: ● - Ongoing
Start Date: 11/1/16
End Date: 12/15/17

National Grid offers this milestone as an opportunity to present the preliminary service and pricing offerings to stakeholders. The Project team has continued to form and analyze a pricing strategy for the microgrid during Q1, Q2, and Q3 2017. Pricing options will be finalized in a manner to be conveyed to stakeholders. The adjusted timeline shifts the emphasis of this task into the fourth quarter of 2017.

4. Phase 2 Completion *(Detailed Engineering Design and Financial and Business Plan)*

Status: ● - Ongoing
Start date: 10/1/16
End date: 3/31/18

National Grid continues to partner with GE and OBG to work on the Detailed Engineering Design and Financial and Business Plan Assessment in line with NY Prize Stage 2. GE is subcontracting with Clarkson and Nova Energy to perform some of the tasks that are outside of GE's area of expertise.

As mentioned in previous Quarterly Reports, the Project team anticipates most of this milestone to be completed by the end of 2017. Project reporting will be completed in Q1 2018. The end objective of this Project continues to be collection and compilation of the data necessary to enable preparing a compelling NY Prize Stage 3 funding application. Based on information currently published on the NYSERDA website, NYSERDA will announce the Stage 3 RFP in May 2018. This allows the Project team sufficient time to complete the tasks associated with NY Prize Stage 2 and develop the detailed engineering design and financial and business plan assessment.

4.0 Work Plan & Budget Review

4.1 Updated Work Plan

The updated Gantt chart from Project Implementation Plan is presented on the following page.

ID	Task Name	Duration	Start
1	**NYSERDA PON Feasibility Study**	**534 days**	**Wed 10/1/14**
2	Project Management and Reporting	22.85 mons	Wed 10/1/14
3	Define Loads and Required Generation	9 mons	Wed 10/1/14
4	Engineering Design	8 mons	Wed 5/13/15
5	Equipment Specification and Cost Analysis	4 mons	Mon 1/4/16
6	**Report Writing**	**534 days**	**Mon 3/14/16**
7	**REV Demonstration**	**534 days**	**Mon 3/14/16**
8	Demonstration Approval	1 day	Mon 4/25/16
9	**General Project Management**	**530 days**	**Mon 3/21/16**
23	Benefit Analysis for Stakeholder Engagement	3.2 mons	Mon 1/2/17
24	**Stakeholder engagement and community outreach**	**338 days**	**Mon 3/14/16**
29	Conceptual Design Complete Milestone	0 days	Thu 9/1/16
30	Initial Engineering Design Recovery Plan (Capital Costs)	4 mons	Mon 6/13/16
31	Initial Tariff Design (Commodity Costs)	6 mons	Mon 9/12/16

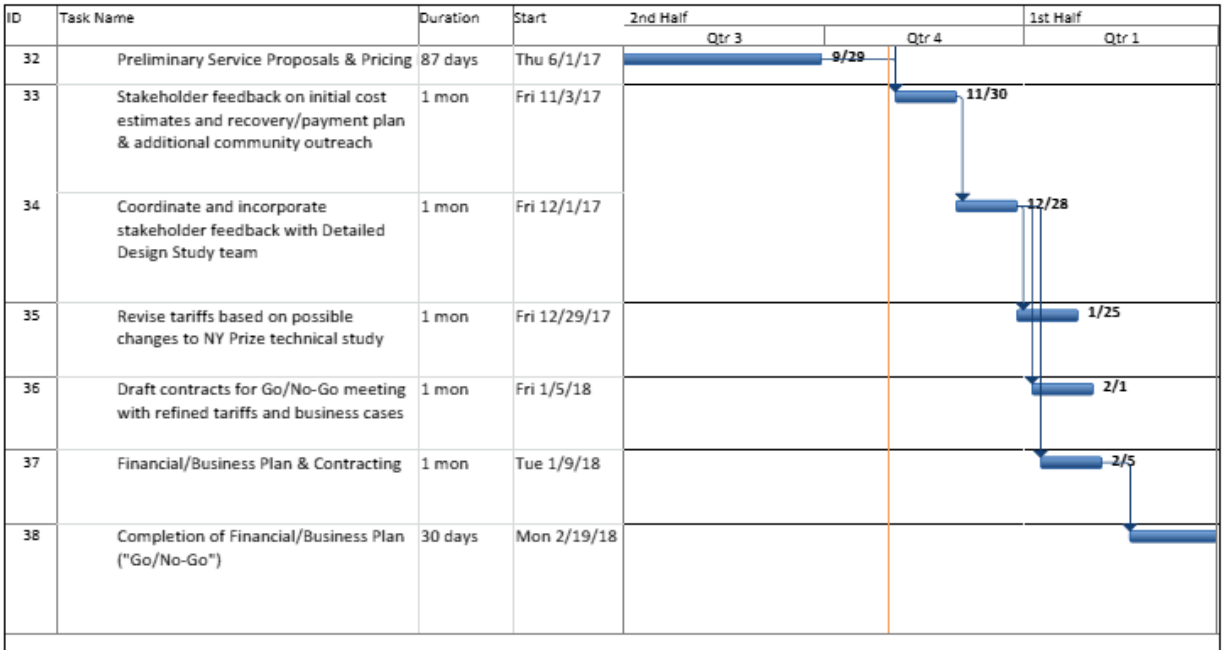

Figure 4.1 – Updated Gantt Chart from Project Implementation Plan.

4.2 Updated Budget

Table 4.1 below displays the updated total expenditures through September 30, 2017.

Task	Budget	Quarterly Spend	Spend to Date	Remaining Balance
Project Administration and Planning	$131,000	$14,338	$308,004	($177,004)
Marketing and Community Engagement	$200,000	$7,166	$43,920	$156,080
Implementation	$275,000	$8,462	$66,995	$208,005
Audit Grade Detailed Engineering Design	$1,000,000	$1,748	$221,121	$779,879
Totals:	**$1,606,000**	**$31,750**	**$640,035**	**$965,965**

Table 4.1 – Updated Budget

The incremental costs associated with the Project as of September 30, 2017 total $193,727. Continued monitoring and reporting of incremental costs will be included in subsequent Quarterly Reports.

Now that the Project has moved from the initial planning and Conceptual Design phase and into the Detailed Engineering Design and Implementation phase, the budget has shifted reliance to the latter's expense line items. While the majority of the Project Administration and Planning budget has been depleted, the Project team will continue to record expenses in this category to track categorical administrative expenses of the Project.

Note that much of the effort by the consultants has not yet been invoiced because the necessary reporting milestones have not yet been met. These milestones will be met in Q4 2017, with invoicing to follow.

5.0 Progress Metrics

The Project participant load size, participant quantity, and linear length of the microgrid dictate the projected cost and configuration of the microgrid construction. This section of the Quarterly Report tracks the current projected cost range of the microgrid depending on the most recent engineering design estimates, as well as the projected resiliency duration of the detailed design.

5.1 Total Cost of Microgrid

The total estimated cost of the microgrid has changed from Q2 2017, as displayed in Table 5.1 below. Additionally, the staged rollout approach (described in Section 2 above) changes the timing of the expenditures and ultimately affects the successful business plan of the microgrid. Explanation of the staged rollout can be found in Section 2.1. Updated costs for each stage will be conveyed in future Quarterly Reports.

Metric	As of Q3 2016	As of Q4 2016	As of Q1 2017	As of Q3 2017 – Whole Microgrid	As of Q3 2017 – Stages 1, 1B, and 2
Projected Cost Range of Microgrid Construction	$35M - $60M[1]	$26.4M - $61.3M[2]	$26.4M - $61.3M[2]	26.4M - $61.3M[2]	Not Yet Determined
Underground Wire Cost Range	$11.3M - $11.8M	$7.4M - $12.0M	$15.4M - $23.8M[3]	15.4M - $23.8M[3]	$8.79M – $13.465M
Projected Resiliency Duration	14 Days	14 Days	14 Days	14 Days	14 Days

[1] *Range includes three (3) generation equipment options and two (2) distribution equipment options.*
[2] *Range includes three (3) generation equipment options and three (3) distribution equipment options.*
[3] *Range includes cost of equipment and installation. Previous estimates only included equipment costs.*

Table 5.1 – Cost of Microgrid

5.2 Tiered Recovery Population

There were no changes to the tiered recovery population stated in the Q2 2017 quarterly report, Customer counts are displayed in Table 5.2.

	Commercial	Residential	Total
Tier 1	12	0	12
Tier 2	404	2,171	2,575
Tier 3	480	2,945	3,425
Tier 4	235	3,360	3,595
Tier 5	1,394	12,736	14,130
Total	2,513	21,212	23,725

Table 5.2 – Tiered-Recovery Customers

Other metrics may be added to subsequent Quarterly Reports as they become more relevant as the Project progresses.