

April 30, 2018

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: FRUIT BELT NEIGHBORHOOD SOLAR REV
DEMONSTRATION PROJECT – Q1 2018 REPORT**

Dear Secretary Burgess:

Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid”) hereby submits for filing its quarterly update to the Fruit Belt Neighborhood Solar REV Demonstration Project Implementation Plan covering the period of January 1, 2018 to March 31, 2018 (“Q1 2018 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 December 2, 2015 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 Fruit Belt Neighborhood Solar REV Demonstration Project.

Respectfully submitted,

/s/ Kara M. Corpus

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Senior Counsel

Enc.

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**Fruit Belt Neighborhood Solar
REV Demonstration**

Q1 2018 Report

April 30, 2018

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1.0 Executive Summary

The Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid”) Fruit Belt Neighborhood Solar REV Demonstration Project (“Demonstration Project” or “Project”), through the partnership with Buffalo Niagara Medical Campus (“BNMC”), Solar Liberty, and the New York State Energy Research and Development Authority (“NYSERDA”), provides solar-generated energy and financial benefits to low-to-moderate income (“LMI”) customers while delivering grid efficiencies to the local electric distribution system.

The LMI customer segments have a very low penetration of solar photovoltaic (“PV”) systems due to various economic barriers. National Grid is promoting utility-owned “in front of the meter” solar PV equipment mounted on residential roofs and roofs of faith-based and community non-profit buildings located within the Project area, and passing on the economic benefits directly to solar PV host customers through a monthly electric bill credit for the lifespan of the solar PV system. Additionally, up to fifty (50) non-hosting residential customers will be selected through a lottery system to receive a bill credit for two (2) years.

The Project consists of installing residential solar PV systems, ranging in size from 3.1kW to 18.5kW and non-profit organizations from 15.9 to 28.0 kW per system, totaling 500 kW (or 0.5 MW) of solar PV generation capacity within a single neighborhood. This approach provides a real life scenario for exploring the technical aspects of enhancing grid efficiency. The Project also explores the social aspects of building positive relationships within the Fruit Belt community resulting from the effort to increase energy awareness and Project participation.

This Demonstration Project is testing the following hypotheses:

- Leveraging utility ownership model to bring solar PV to underserved LMI segment will expand and animate the market for third-party solar installers;
- Providing solar bill credits to participants in a LMI neighborhood, as well as partnering with NYSERDA to deliver energy efficiency (“EE”) programs to further drive energy bill savings, will have a positive impact on bill payment behavior and enable customers to better manage their arrears; and
- Concentrating distributed solar PV resources with reactive power support within an area served by a common substation (versus scattered deployment of conventional solar PV) will deliver measurable grid efficiency benefits.

The Project also aims to develop an understanding of the drivers for cost efficiency and scalability for a utility-owned model, the corresponding economic and job creation impact, and the overall LMI customer perception of renewables, energy efficiency, and the customer-utility relationship.

Progress to Date and Planned Q2 2018 Goals

Solar Installations:

Progress continued in the areas of customer/non-profit organization engagement for pending sites to prepare for solar PV installation in Q2 2018. The solar PV system installation and system interconnection to the grid were suspended for significant part of the Q1 2018 due to adverse weather conditions. As of the end of Q1 2018:

Of approximately 600 homes in the Fruit Belt neighborhood, 69 host a solar PV system.

Approximately ten percent (10%) of homes have roof top solar PV, up from zero percent (0%) two years ago.

This represents significant Distributed Energy Resource (“DER”) adoption in the LMI housing segment.

The solar PV adoption rate in the Fruit Belt neighborhood is approximately five (5) times greater than the general upstate New York electric residential market penetration of solar PV¹

- Fifty-nine (59) residential solar PV systems have been installed and are connected and commissioned;
- Solar PV systems are installed and connected on the buildings of two (2) faith-based non-profit organizations and two non-faith-based non-profit organizations;
- Nine (9) residential solar PV systems are installed and are in the process of being connected to the grid, commissioned, or inspected by City of Buffalo; and
- Owners of one (1) residence and one (1) faith-based non-profit organization building have each committed to installing a solar PV system once they replace the roof on their respective building in Q2 2018.

Customer Engagement:

Customer engagement activities included in-person meetings with non-profit organization representative and interfacing with residential customers who own a home requiring roof replacement prior to being deemed solar ready.

Special efforts were focused on reaching one home owner who previously committed to complete his roof replacement, but had not yet done so. Additionally, outreach efforts were made to one customer who had previously replaced her roof and whose house was at the build-ready stage, but had changed her decision from becoming a host to not becoming a host at the advice of her roofing installer, who stated any solar installation would void his warranty on her roof.

Grid Impact Analysis by GE:

General Electric Global Research (“GE”), GE continued its evaluation of impacts of PV installation on the feeder performance. They collected transformer annual load energy for feeder 3466; and built the simulation platform to conduct impact analysis using pre-selected scenarios. The grid efficiency effects evaluation by GE will continue in Q2 2018.

Energy Efficiency Implementation by NYSERDA:

NYSERDA commenced their customer outreach and engagement for provision of EE services in the Project area. They completed EE upgrades at twenty-eight (28) residences, and have enrolled another seventeen (17) customers in their programs.

¹ Based on a 2016 New York State solar market penetration rate of 0.8%, reported by Ohm Home Now (<https://www.ohmhomenow.com/2016-solar-penetration-state/>).

Planned Q2 2018 Goals:

As more fully set forth below, the remaining solar PV system construction and connection efforts needed to reach the Project’s goal of 500 kW of installed solar generation equipment are planned for Q2 2018. This schedule is based on the expectation that weather conditions will be favorable to construction, and on the expectation that roof replacements by one home owner and one faith-based organization will be completed by early May 2018. Engagement of these parties will continue through the time the solar PV system connections are made. Additionally, engagement efforts will continue with those customers whose systems were installed prior to Q2 2018, but which were not connected and commissioned prior to the end of Q1 2018 due to either prevailing weather conditions or delays in the City of Buffalo permitting process.

As described in detail in the Q4 2017 quarterly report, the bill credit pool lottery was divided into two (2) events. The first was held in Q4 2017 based on the installed kW as of 12/31/17. That group started receiving the bill credit on their January 2018 electric bill. The second bill lottery event will be held following commissioning of all remaining PV systems installed under this Project, and is expected to be accomplished in Q2 2018. Furthermore, the arrearage effect analysis will continue in Q2 2018. NYSERDA will continue executing its EE program offerings for Fruit Belt customers who have enrolled in their EE programs.

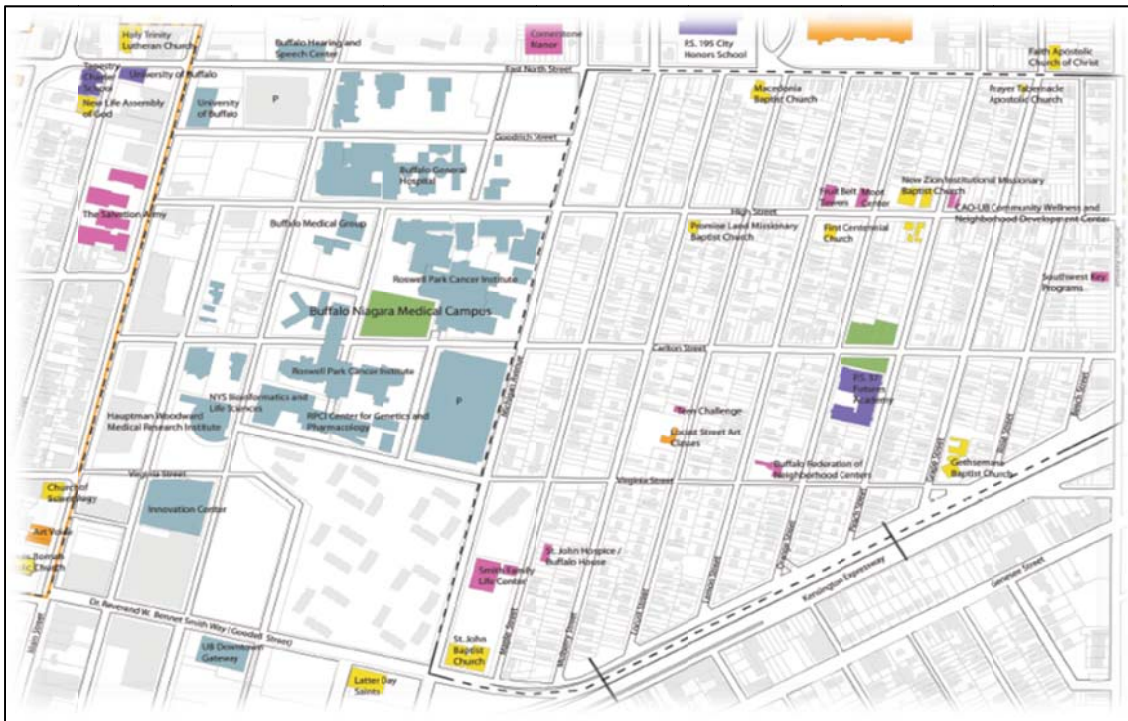


Figure 1-1: Location of the Fruit Belt Neighborhood (dashed perimeter), located adjacent to the Buffalo Niagara Medical Campus

2.0 Highlights Since Previous Quarter

2.1 Major Tasks Completed

- Regulatory Filings:

The Q4 2017 Quarterly Report was prepared and filed with the New York State Public Service Commission on January 31, 2018.

- Community Engagement:

- Customer stewardship efforts continued, by maintaining contact with the residential customers in various stages of Project completion.
- Outreach continued with a non-profit organization building owner to schedule electrical work for the solar PV system connection at the organization's two (2) buildings.
- Engagement continued with one (1) faith-based nonprofit organization to ensure it schedules replacement of the section of its building's roof in Q2 2018, so that it will be able to host a solar PV system.

- Internal Engagement:

- National Grid's Distribution Design Department conducted site visits to guide selection of National Grid's *Electric Service Bulletin 750* -compliant points of attachment locations and code-compliant overhead line re-locations.
- National Grid's Asset Data and Analytics team provided transformer average annual load data and monthly load data.
- National Grid's Account Maintenance and Operation team continued to issue bill credit riders on customer accounts upon solar PV system commissioning.
- National Grid's Collection's Department was engaged to work with the overall arrearage impact analysis process. The process was further developed to define how arrearage customers will be identified, and how they will be monitored to determine what impact, if any, the monthly bill credit receipt has on these customers. The initial screening process of all customer participants (hosts and bill credit recipients) identified to date was also developed.

- Data Evaluation, Measurement & Verification (“EM&V”):
 - Enphase, Inc. continued to send generation data twice monthly; each deliverable containing either the first fifteen (15) days or second fifteen/sixteen (15/16) days of the previous month’s generation data. National Grid’s New York Electric Pricing Group calculated and published the bill credit amount each month of the quarter.
 - The quarterly analysis of the bill credit administration system was completed. The automated bill credit system was determined to be delivering the correct credit amount to the bill credit recipients, which during this quarter consisted only of solar PV hosts. Fifty-nine (59) residents and two (2) faith-based non-profit organization buildings were receiving bill credits by the end of Q1 2018. In addition, two (2) non-profit organization buildings were also generating credits, but due to their service class, the organizations do not receive a bill credit.

- Partner Participation:
 - Solar Liberty:
 - Continued to attend (2) separate progress calls with National Grid each week to ensure timely information flow; both to address overall Project matters and specific installation issues.
 - Prepared and submitted three (3) residential solar PV system building permit applications to the City of Buffalo; building permits for all three (3) were issued.
 - Installed four (4) residential solar PV system arrays.
 - Completed the solar PV system array electrical connection task for three (3) residential houses, two (2) non-profit buildings, and one (1) faith-based non-profit organization building.
 - Received one (1) certificate of completion from the City of Buffalo for solar PV system installation at each of four (4) locations: one (1) house, one (1) faith-based non-profit organization’s building, and two (2) non-profit organization buildings.
 - Commissioned one (1) faith-based non-profits organization’s solar PV system; two (2) solar PV systems on non-profit buildings and four (4) solar PV systems on residences.
 - Issued one (1) roofing assistance check to one (1) home owner who roof replaced the roof on his house to make it solar PV ready. As of the end of Q1 2018d, in total, thirty-one (31) residential and two (2) faith-based organization buildings have replaced their roofs to date. In addition, one (1) residence and one (1) faith-based non-profit organization have committed to replacing their roofs in Q2 2018 to become eligible solar PV system hosts.
 - NYSERDA:
 - Pursuant to the partnership Agreement between NYSERDA and National Grid, NYSERDA commenced delivering no-cost energy efficiency improvements to residents of the Fruit Belt neighborhood.

- Two hundred fifty-one (251) residents expressed interest in receiving a home energy assessment, in-home energy education, air sealing, insulation, low-flow devices, high efficiency lighting, and replacement of inefficient refrigerators and freezers. Table 2-1 provides solar PV system host and non-house EE project participant data.

Table 2-1: Metrics for Energy Efficiency Component by Participant Type- as of 3/31/18

Status	Solar Hosts	Bill Credit Lottery Recipients	Non Hosts	Total
Customers contacted ^a	26	31	194	251
Customers who responded ^b	8	7	45	60
Enrollments (projects in process) ^c	2	1	14	17
Projects complete ^d	4	5	19	28

- a. *Customers contacted*: Unduplicated number of customers responding to National Grid outreach efforts indicating that they are interested in energy efficiency services as of 3/31/18.
- b. *Customers who responded*: Quantity of customers that have returned an application for energy efficiency services to NYSERDA as of 3/31/18.
- c. *Enrollments*: Quantity of energy efficiency projects in process as of 3/31/18.
- d. *Projects complete*: Quantity of energy efficiency projects that have been complete as of 3/31/18.

- GE:
 - GE and National Grid held conference calls during which GE reported their progress on model development. National Grid also reported on the solar PV system connection progress.
 - Continued with the grid efficiency impact analysis, focusing on feeder performance (Task 1.3).
 - Collected transformer annual load energy for feeder 3466.
 - Built the simulation platform (using Matrix Laboratory (“MATLAB”) code) to conduct analysis using the selected scenarios, starting with the baseline (meaning with no PV), then with PV at different power factors (“pfs”), including pf = 1.0; pf = 0.9; pf = 0.8; and dynamic adjustment of the pf.
- BNMC:
 - BNMC did not conduct activities in support of the Project during this quarter.
- Community Participation:
 - As of the end of the Q1 2018, one hundred and seventy-six (176) houses proposed by owners to become solar PV system hosts. This total is comprised of the following quantities:
 - Sixty-nine (69) of those houses either are, or are scheduled, to become solar PV hosts.

- Sixty-seven (67) houses have been disqualified due to roof orientation, roof pitch, excessive shading, viable roof hosting size, and/or a location outside of the Project area.
 - Twenty (20) homeowners opted out of the Project for personal reasons.
 - Twenty (20) houses need their roof replaced as a first step to becoming eligible to host a solar PV system. However, the owners have not chosen to replace their roof and become a solar PV system host.
- Telephone conversations were held with the executive director of the FruitBelt Coalition to keep the organization informed of the Project participation needs.

2.2 Key Metrics

Attached Appendix C contains the Key Metric Reporting Matrix. Q1 2018 activities consisted primarily of building permit issuance, construction, electrical connection, city inspections, and continued customer engagement.

2.3 Challenges, Changes, and Lessons Learned This Quarter

Challenge or Change	What was the Resulting Change to Scope/Timeline?	Strategies to Resolve	Lessons Learned
Roofing contractors may include a clause in their contracts that can be interpreted as voiding their warranty if a solar PV system is installed on a roof they installed.	A customer chose not to participate in the Project after having progressed through the inspection and analysis stages, necessitating identification and enrollment of another home owner to host the solar PV capacity that had been allocated to this customer's roof.	Communicate with the customer's roofing contractor to pre-determine if this is an issue; and either work with the roofing company to revise the clause or assist the homeowner in selecting another roofing contractor that does not include such a clause.	If National Grid is to make a roof replacement contribution, the Company should require the customer to provide a copy of the terms and conditions of their roofing contractor prior to contract execution and prior to any work being done.

3.0 Next Quarter Forecast

Annotated below is the status of the open checkpoints and milestones stated in the January 4, 2016 Implementation Plan, with dates as of this Q1 2018 Report.

As previously noted in the Q1 2017 Report, as the Customer/Stakeholder Outreach Phase 1 (Awareness) and Phase 2 (Enrollment) efforts were undertaken during Q2 2016 and Q3 2016, it became evident that these phases are actually occurring simultaneously, with enrollment occurring as an output of these efforts. Also note that the Phase 3 (Installation) Outreach efforts commenced upon the customer's initial expression of interest and continued throughout the analysis, permitting, and installation processes. This differs from the Implementation Plan, which indicates all customers would first be identified, with installation to immediately follow thereafter.

The overall Project schedule has extended due to three (3) primary factors: customer delays in decision making combined with participation withdrawal; and adverse winter weather conditions; both of which created a prolonged solar PV installation period. Additionally, NSERDA needs time to complete its EE installation work.

Table 3.1 Checkpoints/Milestone Progress

	Checkpoint/Milestone	Anticipated Start/End Date Stated in Q4 2017 Report	Revised Start-End Date as of the end of Q1 2018	Status
1	Finalize contracts with Partners	Completed	<i>Unchanged</i>	●
2	Customer/Stakeholder Outreach: Phase 1: Community Meetings	Completed	<i>Unchanged</i>	●
3	Customer/Stakeholder Outreach: Phase 2: Enrollment	04/16-3/18	<i>04/16 – 04/18</i>	●
4	Customer/Stakeholder Outreach: Phase 3: Installation	10/16-5/18	<i>Unchanged</i>	●
5	Solar PV Assessments	Completed	<i>Unchanged</i>	●
6	Site Selection and Design	Completed	<i>Unchanged</i>	●
7	Meter Installation	07/16-05/18	<i>Unchanged</i>	●
8	Permitting	06/16 -03/18	<i>06/16 - 05/18</i>	●
9	Solar PV Installation	06/16-05/18	<i>Unchanged</i>	●
10	Interconnection	07/16-05/18	<i>Unchanged</i>	●
11	Bill Credits Administrated	08/16 ongoing	<i>Unchanged</i>	●
12	Solar Workforce Hiring	Completed	<i>Unchanged</i>	●
13	GE Grid Efficiency Analysis	10/16 – Q1 2019	<i>Unchanged</i>	●
14	Internal Systems Capability	Completed	<i>Unchnaged</i>	●

KEY

On Track



Delayed start, at risk of on-time completion, or over-budget



Terminated/abandoned Checkpoint/Milestone

1. Partner Contracts Executed.**Status:** **[Completed]**

There were no activities under this previously-completed task.

2. Customer/Stakeholder Outreach: Phase 1: Community Meetings.**Status:** **[Completed]**

There were no activities under this previously-completed task.

3. Customer/Stakeholder Outreach: Phase 2: Enrollment.**Status:** **[Ongoing]**

Enrollment continued during Q1 2018, focusing on two residences and one (1) nonprofit-owned faith-based organization

Targets/Actuals in Q1 2018:

- Target: Obtain signed host agreements from the last four (4) Project enrollees.
 - Actual: Obtained signed host agreements from the last four (4) enrollees.
- Target: Provided weather conditions are favorable, obtain a signed W-9 form from the one (1) residence and one (1) faith based non-profit still requiring roof replacement, as a result of delays caused by adverse weather conditions in Q4 2017.
 - Actual: One (1) residence is no longer interested in hosting a system, and thus will not be providing a W-9 form. A W-9 was obtained from the faith-based non-profit organization.

Target in Q2 2018:

- Target: Obtain a signed host agreement from the home owner who has committed to replacing his roof.

4. Customer/Stakeholder Outreach: Phase 3: Installation.**Status:** **[Ongoing]**

Customer engagement activities continue throughout the solar PV host approval process for each homeowner who signed up to participate in the Project.

Targets/Actuals in Q1 2018:

- Target: Continue to maintain positive engagement throughout the scheduling, installation, and implementation process with each customer currently committed to hosting a solar PV

system. However, weather conditions required for installation may require solar PV installation to be conducted in Q2 2018.

- Actual: The target for Q1 2018 was met.

Target in Q2 2018:

- Target: Continue to maintain positive engagement throughout the scheduling, installation, and implementation process with each customer currently committed to hosting a solar PV system.

5. Solar Assessments.

Status: ● [Completed]

There were no activities under this previously-completed task.

6. Site Selection and Design.

Status: ● [Completed]

There were no activities under this previously-completed task.

7. Meter Installation.

Status: ● [Ongoing] [(Revised) 5/31/2018]

As part of each house or building solar PV installation, an electronic metering system is commissioned. This system reports electrical generation date per solar PV panel. Data collected is aggregated by the contracted system operator and sent to National Grid.

Targets/Actuals in Q1 2018:

- Prevailing weather conditions were not expected to permit construction during this quarter. Therefore, no meter installations were planned for this quarter.
 - Actual: Electrical connection, including meter installation, was conducted at three (3) residential solar PV systems.

Target in Q2 2018:

- Target: All remaining solar PV systems installed under this program, regardless of installation date and regardless of building type, will be connected within five (5) business days following the City of Buffalo's post-construction review of the installed solar PV system.

Solutions/strategies in the event results are below expectations:

National Grid will maintain contact with the electrical contractors to ensure their installation schedules all solar PV system remaining to be installed under this Project get commissioned and interconnected within five (5) business days following the City of Buffalo's post-construction review of a newly-installed solar PV system. National Grid will contact the contractor's upper management if their field team fails to meet this schedule.

8. Permitting.

Status: ● [Ongoing]

The City of Buffalo has been approving solar PV system permit applications generally within three (3) weeks following receipt of the application. This quarter, three (3) building permit applications were submitted; permits were issued for all three (3) applications.

Targets/Actuals in Q1 2018:

- Target: The City will issue building permits in response to the three (3) permit applications submitted just prior to the end of Q4 2017
 - Actual: The City issued building permits for the three (3) submittals made during the last part of Q4 2017.
- Target: The City will issue a building permit for the one (1) residence requiring a roof replacement and for the one (1) faith-based non-profit organization's building.
 - Actual: The roof replacement on one (1) home and one (1) non-profit building were not completed in Q1 due to weather conditions. Once completed, building permit applications for these two (2) buildings will be submitted to the City of Buffalo.

Target in Q2 2018:

- The City will issue building permits for the one (1) residence and the one (1) faith-based non-profit organization' building that required roof replacement.

Solutions/strategies in the event results are below expectations:

If building permits are not issued within three (3) weeks of application submittal, Solar Liberty will contact the City of Buffalo Building Department to discuss the rate of building permit application review. An inquiry will be made to determine what else can be done by Solar Liberty to facilitate the City's permit application review process.

9. Solar Installation.

Status: ● [Ongoing]

Solar PV system Installation continued based on the quantity of building permits received from the City of Buffalo and the prevailing weather conditions.

Targets/Actuals in Q1 2018:

- Solar PV system installation is not expected to occur during Q1 2018 unless appropriate weather conditions prevail. If prevailing weather conditions were deemed by the installation contractor to be suitable, the remaining two (2) permitted residential solar PV systems and the three (3) residential solar PV systems in the permitting application process were planned for installation. The weather conditions required for roof replacement at the faith-based non-profit building were not expected to occur during Q1 2018.
 - Actual: Three (3) residential solar PV systems were installed.
 - Actual: As previously noted in the Q4 2017 report, three (3) homes were added to the Project to backfill the vacancies resulting from three (3) home owners withdrawing from the Project because they decided not replace their roof during the construction phase of the project. Permits for these three (3) houses were obtained during Q1 2018.

Targets in Q1 2018:

- Install, connect, get inspected, and commission all remaining residential, two (2) faith-based and one (1) non-profit organization building solar PV systems.

Solutions/strategies in the event results are below expectations:

National Grid plans to maintain more frequent, yet appropriately-timed, contact with customers and the City Buffalo inspection personnel to ensure their schedules do not prevent completion of all remaining solar Project PV system installation, inspection, and commissioning during Q2 2018.

10. Interconnection**Status:**  **[Ongoing]**

National Grid's Interconnection team is responsible for processing permits for making the electrical connection from the solar PV system to the electric grid.

Targets/Actuals in Q1 2018:

- Complete interconnections within ten (10) business days of solar PV system installation.
 - Actual: System connection to the grid at houses equipped with overhead electric feeds was completed within twenty (20) business days of installation due to and weather conditions. A solar PV system was installed at another houses equipped with an underground electric feed, as connecting these systems to the electric grid requires extensive coordination between the home owner, the electrician, and National Grid.
 - Actual: As of Q1 2018, nearly eight-three percent (83%) of the solar PV system goal of 500 kW had been installed, inspected, and connected to the grid.

Target in Q1 2018:

- Complete the remaining solar PV system interconnections within ten (10) business days of the City's inspection of the solar PV system installation.

Solutions/strategies in the event results are below expectations:

If the issue requires action by National Grid, the Project manager will meet with the appropriate Project personnel to get that action underway. If National Grid determines Solar Liberty or its contractors are the source of the issue, National Grid will confer with Solar Liberty to identify the specific facts and direct Solar Liberty or its contractors to take action to rectify the situation.

11. Bill Credits Administered.**Status:**  **[Ongoing]**

The billing system to calculate and distribute the bill credits was created in Q1 2016. The system has been used each month since its first implementation in Q2 2016.

Targets/Actuals in Q1 2018:

- Target: Continue to distribute all bill credits for the previous month's solar PV credit using the designed bill credit system.
 - Actual: Monthly bill credits are being generated and issued for each of the solar PV systems installed and commissioned to date.
- Target: Provide the bill credit rider to the thirty-four (34) customers identified to receive the bill credit via the bill credit lottery.
 - Actual: As stated in the Q4 2017 report, the bill credit lottery was held, and the first thirty-four (34) customers to receive the credit were identified. The bill credit rider was added for these customer accounts and they started receiving the bill credit rider in January 2018. They will receive the bill credit for twenty-four (24) months.

Targets in Q2 2018:

- Target: Continue to distribute all bill credits for the previous month's solar PV credit using the designed bill credit system.
- Target: Once this Project's remaining solar PV systems are installed and commissioned, conduct Part 2 of the bill credit lottery to identify twenty-five (25) additional bill credit recipients. Set up the bill credit riders for a 24-month period on these accounts.

Solutions/strategies in the event results are below expectations:

Once identified, any issue with the bill credit system will be reviewed and resolved with the appropriate internal or external parties as soon as feasible.

12. Workforce Development (Recruitment of Local Solar PV Employees)

Status: ● [Completed]

There were no activities under this previously-completed task.

13. GE Commissioning and Grid Monitoring

Status: ● [Ongoing]

GE grid efficiency analysis consists of feeder modeling and simulation, controls integration, and grid testing.

Targets/Actuals in Q1 2018:

- Target: Commence the feeder performance analysis based on the total connected generation as of 1/31/18. As additional generation is commissioned in Q2 2018, adjust the performance analysis to include that generation.
 - Actual: Compiled data for the feeder performance analysis;
 - Continued evaluating the impacts of PV systems on feeder performance;
 - Collected transformers annual load energy for feeder 3466; and
 - Built the simulation platform (using Matrix Laboratory ("MATLAB") code) to conduct analysis using the selected scenarios, starting with the baseline (meaning with no PV), then with PV at different power factors ("pf's"), including pf = 1.0; pf = 0.9; pf = 0.8; and dynamic adjustment of the pf.

Targets in Q2 2018:

- Target: Conduct feeder performance analysis and compare results of the baseline with the solar PV generation.
- Target: Validate the baseline results with National Grid.
- Target: Grid impact analysis will be completed in Q3-Q4 timeframe based on field data collected following commission of most solar PV systems.

14. Internal Systems Capability.

Status: ● [Ongoing]

The toll-free number continued to operate in Q4 2017.

Targets/Actuals in Q1 2018:

- Continue to maintain internal systems in working condition through the quarter.
 - Actual: Maintained internal systems in working condition throughout the Q1 2018.

Targets in Q1 2018:

- Continue to maintain internal systems in working condition throughout the quarter.

4.0 Work Plan & Budget Review

4.1 Updated Work Plan

The Project schedule is extended to the end of Q1 2019. An updated Project completion schedule is forth Table 4-1, below:

Schedule Milestone*	Implementation Plan Date	Actual/Projected Date	Reasons for Extension
Project Start Date:	Nov-15	Jan-16	DPS final approval received 2 months from initial approval required to complete the project
Host Sites Selection Completed:	Aug-16	Dec-17	Customer enrollment strategy was revamped after initial enrollment efforts were deemed ineffective.
500 kW of PV Installed:	Nov-17	May-18	Adverse weather conditions and customer delays.
Total Project Completion:	Aug-17	Mar-19	Additional time required for completion of Energy Efficiency projects and grid impact analysis.

Table 4-1: Project Milestone Planned and Extended Dates

*As noted in the Q4 2017 report, six (6) tasks (Customer/Stakeholder Outreach – Community Meetings, Installation, Permitting, Meter installation, Solar PV Installation, and interconnection) were extended due to the late Q4 2017 addition of new participants, and due to weather conditions adverse to solar PV system construction. See Appendix A, Figure A-1.

4.2 Updated Budget

There were no new items identified this quarter that may adversely impact the Project budget. The revised Project budget¹ is presented below in Table 4-2:

Project Task	Quarterly Actual Spend	Project Total Spend to Date	Project Incremental Cost Budget ²	Total Remaining Incremental Budget Balance
CapEx				
	\$191,738	\$2,197,078	\$2,468,868	\$271,789
Grants Credited Against Incremental Capital Costs				
n/a	n/a	n/a	n/a	(\$) n/a
OpEx				
Project Administration and Planning	\$10,057	\$926,106	\$30,000	-\$866,106
Marketing and Workforce Development	\$70	\$155,751	\$250,000	\$94,268
Incentives	\$0	\$12,245	\$0	-\$12,245
Implementation	\$278,928	\$387,230	\$718,332	\$331,102
Evaluation and Analysis	\$939	\$176,932	\$325,000	\$148,068
Total:	\$289,994	\$1,658,264	\$1,323,332	-\$304,913
Grand Total:	\$481,732	\$3,855,342	3,792,200	-\$33,124

Table 4-2: Quarterly Project Cost Data

Note: Project costs reported in Table 4-2 consist of the total of the incremental and the non-incremental costs incurred. However, the Project *budget* values listed consist only of incremental costs. The Project's total incremental OpEx cost as of March 31, 2018 was \$578,109.88, leaving a remaining OpEx budget of \$745,222. Only the incremental costs are assessed to the Project budget.

² An internal review of the Project budget revealed certain costs (*e.g.*, installation costs) were incorrectly categorized as operational costs (Opex), when in fact they are capital costs (Capex). The budget was revised starting in the Q4 2017 quarterly report to reflect this re-categorization, and to include incremental costs. However, the total Project budget has not changed.

5.0 Progress Metrics

Table 5-1 presents key Project metric tracking data available as of the end of Q1 2018.

Time Frame		Outreach	Residential Customer Tier						Solar Installation Progress (Houses and Non-profit Buildings)					Generation and Credits (Residential and Non-profit Organization Buildings)				Residential Arrearage Participant Evaluation
Project Quarter	Calendar Year	Residential Expressions of Interest (Calls Received, Canvass Response)	Tier 1 Eligibility	Tier 1 Enrollment	Tier 2 Eligibility	Tier 2 Enrollment	Tier 3 Eligibility	Tier 3 Enrollment	Roof Assessments Completed	Structural Assessments Completed	Electrical Assessments Completed	Roof Systems Installed	Roof Systems Connected	kW on-line	kWh generated	Quarterly Bill Credit Distributed [\$]	Cumulative Qty of Bill Credit Recipients	Arrearage Participant Quantity
1	Q1 2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$0.00	0	0
2	Q2 2016	34	5	1	0	0	14	0	14	10	14	1	0	0	0	\$0.00	0	0
3	Q3 2016	28	10	1	0	0	16	0	26	9	5	1	2	12.22	2,408	\$33.96	2	0
4	Q4 2016	78	16	2	0	0	34	0	54	21	24	2	2	10.92	2,631	\$116.99	3	0
5	Q1 2017	14	40	2	0	0	14	0	13	19	16	3	2	12.74	5,670	\$268.10	7	0
6	Q2 2017	12	8	2	0	0	13	0	9	13	13	31	2	13.00	13,775	\$361.36	8	0
7	Q3 2017	8	-1	32	0	0	6	0	19	18	18	15	28	194.64	17,153	\$615.00	14	0
8	Q4 2017	2	-8	15	34	34	10	0	3	9	9	15	20	82.54	6,733	\$2,610.00	56	0
9	Q1 2018	0	-1	4	0	0	0	0	0	0	0	4	7	85.79	9,145	\$4,170.00	0	0
10	Q2 2018																	
11	Q3 2018																	
12	Q4 2018																	
Totals:		176	69	59	34	34	107	0	112	99	99	72	63	411.85	57,521	\$8,175.41		

* - Five added after changing minimum roof system size from 4.0 kW to 3.0 kW.

Notes:

- 1 Although Tier 1 and Tier 2 customers are eligible for the energy efficiency offerings, the customers may not necessarily enroll to receive these offerings.
- 2 The quarterly bill credit distributed is a function of an algorithm that accounts for participant quantity and the seasonal fluctuation in kWh generated.

Table 5-1

Appendix

Appendix A: Updated Gantt Chart (as of the end of Q1 2018)

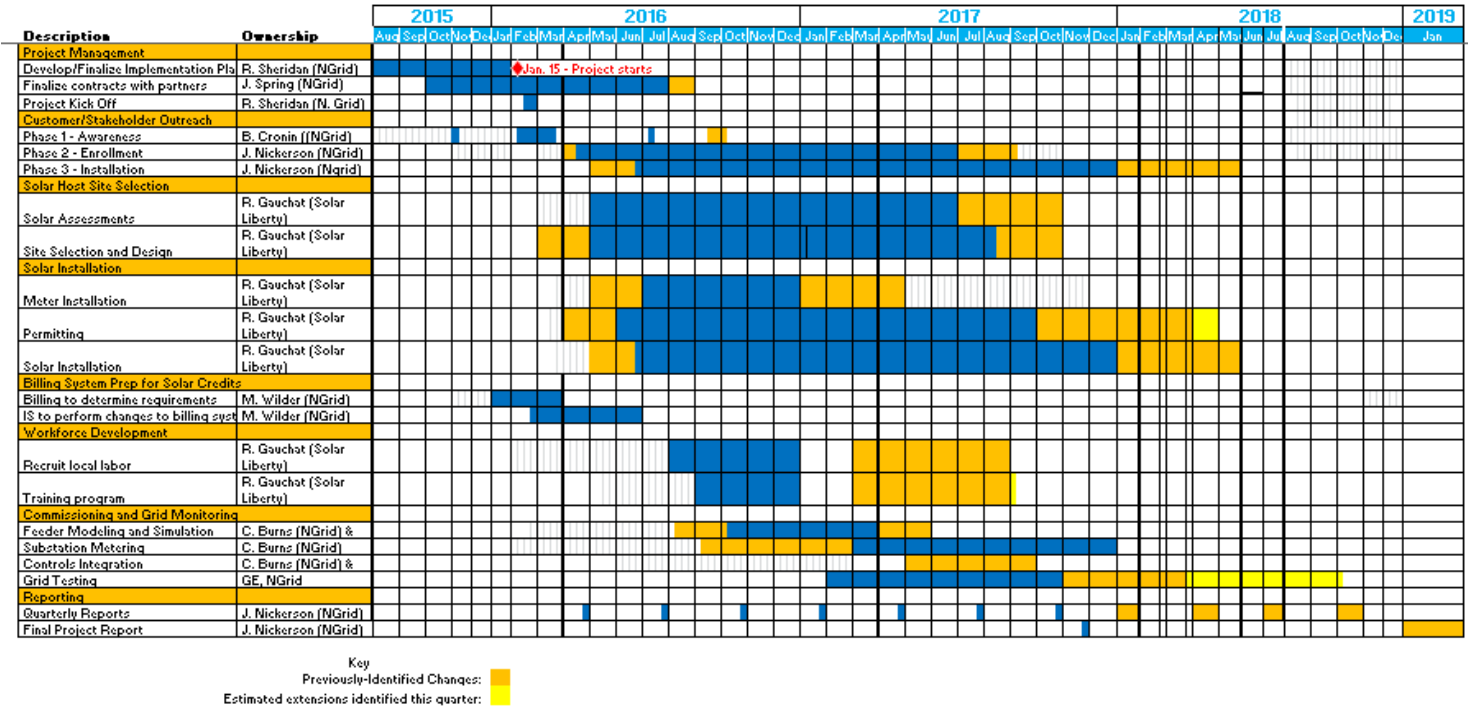


Table A.1 – Updated Gantt Chart