Karla M. Corpus
Senior Counsel
NY Regulatory

October 31, 2016

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)

NATIONAL GRID: FRUIT BELT NEIGHBORHOOD SOLAR REV DEMONSTRATION PROJECT – Q3 2016 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 July 1, 2016 to September 30, 2016 ("Q3 2016 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:

Philip Austen
Director, New Energy Solutions Delivery
National Grid
175 East Old Country Road
Hicksville, New York 11801
Tel.: 516-545-4753
Mobile: 631-599-0285
Email: pausten@nationalgrid.com

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/ Karla M. Corpus

Karla M. Corpus
Senior Counsel

Enc.

cc: Tammy Mitchell, DPS Staff, w/enclosure (via electronic mail)
Marco Padula, DPS Staff, w/enclosure (via electronic mail)
Denise Gerbsch, DPS Staff, w/enclosure (via electronic mail)
Allison Esposito, DPS Staff, w/enclosure (via electronic mail)
Cathy Hughto-Delzer, w/enclosure (via electronic mail)
Edward White, w/enclosure (via electronic mail)
Philip Austen, w/enclosure (via electronic mail)
Dennis Elsenbeck, w/enclosure (via electronic mail)
Fouad Dagher, w/enclosure (via electronic mail)
Jonathan Nickerson, w/enclosure (via electronic mail)
Laura Tadevossian, w/enclosure (via electronic mail)
Daniel Payares Luzio, w/enclosure (via electronic mail)
Eliza Davis, w/enclosure (via electronic mail)
Sydney Forrester, w/enclosure (via electronic mail)
Clayton Burns, w/enclosure (via electronic mail)
Pamela Dise, w/enclosure (via electronic mail)
Carol Teixeira, w/enclosure (via electronic mail)
Jason Eno, w/enclosure (via electronic mail)
Janet Audunson, w/enclosure (via electronic mail)

Fruit Belt Neighborhood Solar

REV Demonstration
Q3 2016 Report

October 31, 2016

Table of Content

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") ("the Partnership"), 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 concentration of one hundred (100) rooftop solar systems totaling 0.5 MW of solar photovoltaic ("PV") generation capacity within a specific neighborhood provides the technical conditions necessary for exploring grid efficiency as well as the opportunity to build positive relationships with the local residential community, increasing energy awareness and Project participation. Using utility-owned solar PV equipment mounted on residential roofs, participating residents who are National Grid customers will receive a monthly electric bill credit for the lifespan of the solar PV system.

This Demonstration Project will test the following hypotheses:

- 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.
- Concentrating distributed solar PV resources with reactive power support within a boundary served by a common substation versus scattered deployment of conventional solar PV will deliver measurable grid efficiency benefits.

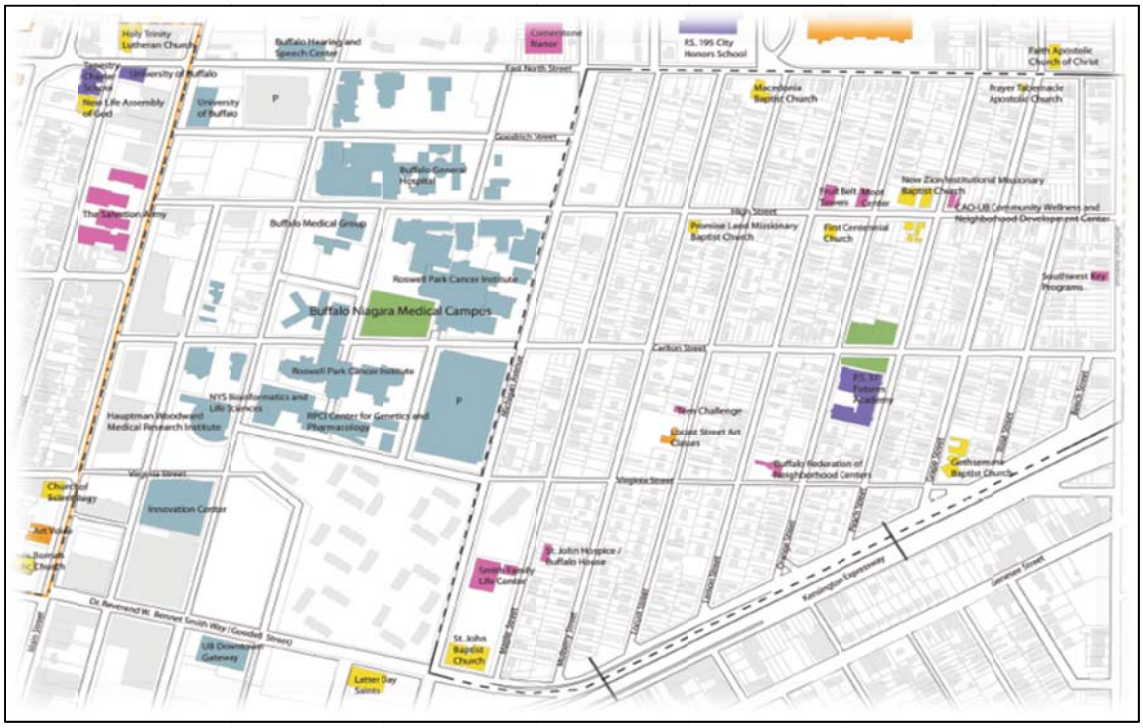

Figure 1-1: Location of the Fruit Belt Neighborhood (dashed perimeter), located adjacent to the Buffalo Niagara Medical Campus

REV Goal Support

The Demonstration Project supports multiple REV goals using an innovative approach to clean energy collection in a residential area. The electricity generated offsets demand for fossil-fuel generated electricity, thereby meeting the REV goal of reducing greenhouse gas emissions. Local energy production adds resiliency to the local grid, and hiring and training local residents on system sales and installation fulfills yet another REV goal – that of creating new jobs and business opportunities. Collectively, the Demonstration Project's support of multiple REV goals makes it highly valuable in testing the effectiveness of REV objectives as well as modeling how to effectively attain REV goals in a cost-effective, integrated manner.

Progress to Date and Planned Q4 Goals

Extensive progress was made on this Demonstration Project during Q3 2016 in the areas of partner contract finalization, marketing outreach material development and distribution, solar PV host selection, bill crediting, and a solar PV system connection design, culminating as planned with the Project's second solar PV system installation and the interconnection of two (2) solar PV systems into the grid. In addition, the next community engagement effort, consisting primarily of canvassing, was planned and the canvassing contract work scope was prepared and accepted by the firm, Threshold, Inc. Solar PV power generation data reporting processes were defined, and the data transfer process was emplaced. The contract to evaluate grid effects resulting from the solar PV installations was signed by the consultant, General Electric Global Solutions ("GE"). Lastly, alternative approaches to capturing additional Project participation to help reach the Demonstration Project's stated 500 kW solar PV installation goal were identified and researched.

As more fully set forth below, several major efforts are planned for Q4 2016. Phase 3 of Community Outreach/Engagement will be undertaken which is anticipated to generate additional solar PV host applicants, as well as applicants to NYSERDA's energy efficiency program. The grid effects evaluation by GE will commence, and bill pool lottery participants will continue to be identified. Q4 efforts will also include workforce development (see Section 3.1).

2.0 Highlights Since Previous Quarter

2.1 Major Tasks Completed

- Regulatory Filings:
    - The Q2 2016 quarterly report was prepared and filed with the New York State Public Service Commission.

- Community Engagement:
    - Postcards announcing the solar and energy efficiency program opportunities were prepared and sent to all (500+) electric residential accounts located within the Fruit Belt Project area. Two (2) events of post card mailings were conducted: the first week of July and the fourth week of July. These mailings yielded significant program enrollment.

    - A letter to homeowners was prepared and distributed to all those located within the Fruit Belt Project area. This effort yielded significant enrollment.

Figure 2-2: Postcards were sent to National Grid electric account holders in the Fruit Belt to raise program awareness and drive enrollment

- Newspaper advertisements were prepared and published for three (3) weeks each in two (2) regional newspapers: *The Challenger* and *The Buffalo Criterion*. This effort did not yield any enrollment. The few calls received were from residents living outside the Project area. However, this effort still provided value by raising public awareness of the Project.

- A canvassing effort was designed and a contract was executed with a local outreach firm, Threshold, Inc. A canvassing script was prepared and a task flow chart for the canvassing was prepared as a training aid for the canvassers. Project-specific photo identification cards, project-branded clothing, and project car magnet labels were prepared and provided to the canvassers. These items will help build program credibility with the residents to be visited by the canvassers. The list of qualified homes based on roof size, orientation, and shading review, prepared by the Project's installation contractor, Solar Liberty, was further refined to exclude existing participants.

- National Grid set up and staffed a program sign-up booth at the Farmer's Market held at the Moot Community Center on Orange Street on August 4, 2016.

- National Grid facilitated interviews by *The Buffalo News*, which culminated in an article about the Fruit Belt Neighborhood Solar Partnership published on August 16, 2016. An op-ed news article was subsequently published in *The Buffalo News* on August 18, 2016 praising the partnership's efforts (see Appendix D).

- Internal Engagement:

  - Several meetings were held with National Grid's Distribution Design ("DD") staff to establish a flow path for engaging the Company's crews. It was determined that two (2) visits would be necessary to each potential host house. The first visit will be to conduct an initial assessment of the electric service line, point of attachment ("POA"), meter location, and compliance with City of Buffalo code requirements and National Grid electric service requirements. A second visit will be conducted at the house where the owner has chosen to move forward with becoming a solar PV host. This visit will be used to mark the new meter location if the exiting one does not meet electric code or service requirements, as well as to gather the information needed for any National Grid service requests, such as re-locating or replacing a service line. The flow path for requesting DD field visits was defined and a flow chart defining the steps between DD, customer fulfillment, and Solar Liberty was created and reviewed.

Figure 2.1: National Grid set up a registration booth at the farmer's market held at the Moot Community Center on August 4, 2016

- Meetings were held with National Grid's Overhead Line ("OH") Department to provide crew instructions in interconnecting the Fruit Belt solar PV systems. The "in front of the meter" service connection method required by the Project is not consistent with typical OH connections. Diagrams and photographs were created to educate the OH Department teams on the solar PV configurations they will encounter, enabling them to better estimate the time requirement for such interconnections.

- The Project generates non-traditional meter installation requests. Meetings were held with the National Grid's Customer Meter Services ("CMS") group manager to develop a communication flow chart so that the manager will know when to send out a crew to install a meter, and for the Project manager to learn when the meter installation has been completed for a Fruit Belt solar PV system. It was also determined that bi-directional meters are required for the solar PV systems due to the wiring configuration used to bring power from the PV array into the grid.

- Meetings were held with National Grid's Retail Connections engineers to develop an acceptable design for two (2) system types; power entering the premise from an overhead line, and power entering the premise via an underground feed.

- A field inspection tour was held with the lead DD field evaluator to learn what types of electric code compliance issues are being encountered at houses that will be in the Project. Noteworthy is that many houses have meters located in non-compliant locations. Also, some houses have had modifications such as the addition of balconies. In the case of balcony additions, this renders the service cable point of attachment non-compliant, because the cable and weather head are no longer out of reach from persons standing on such balconies.

- National Grid's Specifications for Electrical Installations Committee ("SEIC") continued its review of the proposed meter collar as a way of connecting the solar PV output to the grid.

- Documentation for capitalizing solar PV systems was finalized.

- National Grid designed and received internal approval for two (2) approaches to connecting to feeds that enter the residence from underground.

- Data Evaluation, Measurement &Verification ("EM&V"):

  - Enphase accuracy meter testing was completed at National Grid's meter test facility. The Enphase meter was determined to be 99.999% accurate; exceeding the ANSI C12.20 requirement of 99.5% minimum accuracy.

  - Issued the Program's first bill credit.

- Partner Participation:

  - Weekly and bi-weekly progress calls with each Project partner were conducted to ensure timely information flow.

  - Solar Liberty:
    - Installed the Project's second solar PV system array;
    - Connected both the first and second PV system installations to the grid;
    - Completed and made initial submittal for obtaining ISNetworld ("ISN") certification;
    - Prepared and submitted eight (8) building permit applications;
    - Conducted preliminary on-site reviews of thirteen (13) houses;
    - Completed electrical, roofing, and structural reviews of seventeen (17) houses;
    - Researched market for UL-Listed refurbished meters and determined none are available.

        - Determined 4G internet modem will work best for transmitting each system's generation data ; retrofitted first system from 3G to 4G;
        - Met with three (3) members of the City of Buffalo's Building Department, which is responsible for issuing building permits for solar PV systems; acquainted them with the proposed solar PV system connection design; and learned they require the submission of the UL listing of any equipment not owned by utility, including any refurbished meters.

    - NYSERDA :
        - Finalized the energy efficiency (EE) program customer information transfer process;
        - Further developed the File Transfer Protocol ("FTP") data transfer approach.

    - GE:
        - The contract for grid efficiency analysis was finalized and signed by GE and National Grid.

    - BNMC:
        - Arranged for a booth space at the farmer's market held Thursday, August 4, 2016, at the Moot Community Center. National Grid subsequently set up an informational booth where market shoppers could learn about the Project;
        - Assembled a list of roof replacement financing options offered by the City of Buffalo. This list was subsequently provided to Solar Liberty for distribution to potential program participants who need a new roof in order to become eligible to host a solar PV system.

- Community Participation:

    - The following are cumulative quantities as of the end of Q3 2016;
        - Sixty-two (62) account holders have indicated interest in becoming a solar PV host;
        - Subsequently thirty (35) houses were deemed unfit to host solar PV due to shading, roof size, roof pitch, or roof orientation;
        - Of the remaining 27 houses:
            - Two (2) solar PV Systems were installed; both now energized (as of August 30, 2016);
            - Six (6) houses were determined to be solar ready;
            - Eight (8) houses are currently under review;
            - Six (6) houses were reviewed and determined to need roofing repairs that cost more than the $2,000 allocation provided by this Project;
            - Four (4) houses are in the permitting phase of the Project;
            - One (1) house was deemed solar ready but the owner withdrew for personal reasons.

- As previously noted, the total residential participation may not yield sufficient roof space to achieve the 500 kW Project goal. Three (3) alternative actions were identified to help attain the goal:

  - Install systems on roofs capable of hosting 3 to 4 kW, rather than limiting Project participation to just those roofs capable of hosting greater than 4.0 kW installations. This alternative costs slightly more per system to the pricing structure of the installation contract. Each system has an incremental cost due to the fixed costs regardless the system's size. The system installation cost was calculated to be inclusive of the fixed costs, and it was on a per-watt basis, assuming a 5.0 kW average system size. The incremental fixed costs for 3 to 4 kW systems are not captured in this pricing structure. The average additional incremental cost of these 3.0 – 4.0 kW systems is $1,500.

  - Several non-profit owned buildings are located in the Fruit Belt neighborhood, including churches, a community center, and two rooming houses, which are all residential accounts. These roofs were evaluated for their potential kW hosting size, orientation, shading, and pitch. This evaluation showed that if the majority of these buildings were to host solar PV systems, they collectively could contribute approximately 20% to the 500 kW Project goal. The rationale for including non-profit owned buildings is that the generation and the benefits remain within the Fruit Belt neighborhood. This alternative will be further evaluated following analysis of the canvassing campaign results, which is scheduled for completion in Q4 2016.

- Roof condition field findings were reported to New York State Department of Public Service Staff ("Staff") during the Q2 2016 quarterly report meeting held on July 20, 2016. Several roofs were determined to be in unsatisfactory condition, and will require replacement (rather than repair) before installing a solar PV system. However, such roof replacement costs exceed the Project's $2,000 per house allocation for electrical upgrades, structural support addition and roof repairs. One option discussed with Staff is to revise the Project scope to permit homeowners to apply any unspent repair funds toward a new roof. This idea was tabled until the Q3 2016 quarterly report meeting.

.

Figure 2-3: Inverter installed on each solar panel

2.2 Key Metrics

Key Project metrics were developed based on the data needs and the proposed work scope. The ability of the selected equipment and systems to provide the key metric data was verified. Attached Appendix C contains the Key Metric Reporting Matrix. Q3 2016 activities consisted primarily of enrollment and determination of "solar readiness" and data collection pertaining to engagement and participation. The second solar PV system was installed in August 2016, and the generation and bill credit data became available in September 2016.

2.3 Challenges, Changes, and Lessons Learned

Issue or Change	What was the Resulting Change to Scope/Timeline?	Strategies to Resolve	Lessons Learned
Various National Grid internal working groups are configured to receive work requests from one specific source.	Additional time is required to accommodate Distribution Design's on-site review of electrical equipment compliance with National Grid's electric service requirements.	Develop flow charts for new internal processes; obtain reviews of draft flow charts by each group involved.	Developing a flow chart for new internal processes, and obtaining reviews by each group involved significantly streamlines execution of the work flow process.
The only responses from newspaper advertising were from two (2) residents located outside the Project area.	Deleted second planned newspaper advertising event and eliminated planned advertising from a local radio station.	Replace broad-based advertising with additional direct face-to-face discussions such as those conducted at the public meetings.	Newspaper advertisements are not always effective at inspiring readers to call the Project's toll-free telephone number to inquire about the solar PV program. Conversely, direct face-to-face discussions such as those conducted at the public meetings yield the greatest customer participation sign-up.
Contractors were not posing questions when they should, and there was no method in place for keeping them informed of the overall Project status, nor was there a method for them to inform National Grid. of their progress.	There was no change to the written work scope. Rather, a routine call was instituted with each contractor and Project partner.	Hold separate weekly progress conference calls with each contractor and Project partner to provide a forum to communicate concerns so that they can be addressed quickly. The call also enables the Project team to recognize what approaches are working.	Holding weekly progress calls with contractors provides a forum to communicate and quickly address issues contractors may encounter, and to report progress. Expecting the contractor to promptly contact the Project team each time they have a question is unrealistic, as contractors do not generally take time from their ongoing work to call and discuss an issue.

Issue or Change	**What was the resulting change to scope/timeline?**	**Strategies to resolve**	**Lessons Learned**
City of Buffalo electrical inspectors and National Grid in-house Distribution Design and Overhead line staff are unfamiliar with connecting solar PV systems directly to the grid. They tend to assume solar PV connections feed directly into a residential service rather than the local grid.	No direct work scope change. Reminders that these solar PV systems are being connected in front of the meter were inserted into relevant discussions.	Each time a person or group new to the Project interacts with the Project, the 'in front of the meter' connection process will be described. They will also be shown a diagram of the proposed wiring configuration and instructed on how it differs from traditional solar PV connections.	Merely stating to City of Buffalo electrical inspectors and to National Grid in-house engineers and line workers that the wiring configurations for systems installed under the Project will be 'in front of the meter' is insufficient. Far more productive is meeting one-on-one with inspectors and in-house staff to show them and discuss a diagram of the proposed wiring configuration for these system types and explain how it differs from traditional solar PV connections.
Use of refurbished electric meters is not permitted by the City of Buffalo.	Standard National Grid meters need to be installed at solar host houses for customers interested in accessing the generation data from the array on their house.	Install only National Grid-owned meters as a secondary meter capable of providing generation data	The City of Buffalo electric code requires submission of proof of UL testing and certification for any proposed refurbished equipment that is not owned by National Grid.
Host agreement complexity causes some customers to hesitate at length before signing.	The overall Project installation schedule is extended.	Streamline and/or simplify the host agreement document; encourage hesitant customers to either have their own attorney review the host agreement, or speak with a trusted friend who has had an attorney review it.	Make the host agreement language easy to understand and make the document as short as possible without sacrificing thoroughness.

Issue or Change	What was the resulting change to scope/timeline?	Strategies to Resolve	Lessons Learned
The City of Buffalo electric code states if three (3) electric meters are needed at a specific site (*e.g.*, a multi-family dwelling), an extra fourth meter is then required to enable "house" electric use to be paid separately from the electric use by each apartment. The City of Buffalo electric code assumes all electric meters are for consumption only; it does not differentiate between electric use metering and electric generation metering.	There was no appreciable change to the Project scope or timeline.	Review City of Buffalo electric code for possible conflicts arising from applying the code to solar PV systems. Develop a list of concerns and meet with City of Buffalo representatives to express the concerns and present solutions or rationale as to why the code is not applicable to a solar PV system. Secure exemptions or variances in writing from the City of Buffalo Department of Permit and Inspection Services.	Closely review municipal electric codes to determine what, if any, impacts may result from applying the code to a solar PV system.
Several houses have been found to be out of compliance with current electrical code. Examples include service entrance cables that are too close to second story porches; meters located too close to the property line; and POAs that are too low. Addressing these items becomes an additional Project expense if they are not identified and included in the Project budget during the Project planning process.	Permitting is delayed until a cost estimate for the additional electric upgrades are made to make the house electrically code compliant.	National Grid conducts an initial site visit at each house whose owner is interested in becoming a solar PV host. The exterior electrical connection, POA, and meter positions are inspected for code compliance. Results are reported to the installation contractor, who obtains a quotation for any necessary additional site electrical work required to gain code compliance.	Conduct a preliminary survey of the electrical equipment configurations and conditions in the neighborhood prior to budgeting and scheduling a Project.
Standard uni-directional meters installed to measure solar PV system generation read backward due to the wiring configuration required by National Grid's electric service requirements.	No delays. The Project scope was changed to address this issue.	Install bi-directional meters for PV systems connected in front of the meter.	Review the utility's electric service requirements for metering with respect to the proposed wiring configuration and current flow direction. Bi-directional electric meters are required for solar PV systems connected on the line side of residential systems.

3.0 Next Quarter Forecast

Annotated below are the status of the open checkpoints and milestones stated in the January 4, 2016 Implementation Plan, with dates stated in the Q3 2016 Report. Previously completed checkpoints and milestones are not included.

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 commence upon a customer's initial expression of interest and continue throughout the analysis, permitting, and installation processes. This differs from the Implementation Plan, which indicates all customers would first be identified, with installation to follow thereafter.

Table 3.1 Checkpoints/Milestone Progress

	Checkpoint/Milestone	Anticipated Start/End Date stated in Q2 2016 Report	Revised Start-End Date	Status
1	Finalize contracts with Partners	08/16	*Unchanged*	
2	Customer/Stakeholder Outreach: Phase 1: Community Meetings	04/16- 8/16	*Unchanged*	
3	Customer/Stakeholder Outreach: Phase 2: Enrollment	04/16-10/17	*Unchanged*	
4	Customer/Stakeholder Outreach Phase 3: Installation	10/16-11/17	*Unchanged*	
5	Solar Assessments	05/16- 06/17	*Unchanged*	
6	Site Selection and Design	01/01/16 – 8/17	*Unchanged*	
7	Meter Installation	07/16-12/17	*12/16*	
8	Permitting	06/16 -07/17	*Unchanged*	
9	Solar PV Installation	06/2016-11/17	*Unchanged*	
10	Interconnection	07/16 ongoing	07/16 – 11/17	
11	Bill Credits Administrated	08/16 ongoing	*Unchanged*	
12	Solar Workforce Hiring	Q3 2016	Q4 2016	
13	GE Commissioning and grid monitoring	08/16 ongoing	*Unchanged*	
14	Internal Systems Capability	10/15-04/16	*Unchanged*	

Key

On Track

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

Terminated/abandoned Checkpoint

1. Partner Contracts Executed.

Status: [Ongoing]
National Grid's contract with GE was signed in Q3 2016. No further action is required. The Solar Liberty contract was previously executed.

2. Customer/Stakeholder Outreach: Phase 1: Awareness.

Status: [Ongoing]
Outreach and Education Phase 2 will be implemented in Q3 2016 to continue to drive Project enrollment. Phase 2 efforts will include two rounds of postcard mailings advertising the Project to all electric account holders; a targeted mailing to homeowners and landlords of houses determined to be likely Project candidates based on roof size and shading, as identified through Google images; a booth set up at the local farmers market held on select days in the summer. Project representatives will continue to provide information to potential and existing participants regarding enrollment, billing credits, educational resources, workforce development, solar PV, and energy efficiency. All targets for Q3 2016 were met.

Targets/Actuals in Q3 2016:

- Target: Develop and mail out two (2) rounds of postcards to all electric account holders;
  - Actual: Developed and mailed out two (2) rounds of postcards to all electric account holders;
- Target: Develop and mail a targeted letter to the homeowners and non-resident landlords of house meeting screening criteria;
  - Actual: Developed and mailed a targeted letter to the homeowners meeting screening criteria;
- Target: Respond to 100% of calls received from the Project's toll-free number;
  - Actual: 100% of the calls received were responded to within one (1) business day;
- Get at least twenty-five (25) new expressions of interest in the Project;
  - Actual: This metric was moved to the 'Enrollment' reporting;
- Evaluate at least fifteen (15) houses as potential solar PV hosts;
  - Actual: This metric was moved to the 'Enrollment' reporting;
- Install at least five (5) solar PV systems;
  - Actual: This metric was moved to the 'Enrollment' reporting.

Target in Q4 2016:

- Develop and mail a targeted postcard to the homeowners and non-resident landlords of houses meeting screening criteria to announce upcoming canvassing effort;
- Canvass at least 75% of the owners of houses pre-qualified based on roof size, orientation, and shading.

Solutions/strategies in the event results are below expectations:

If results fall below expectations, National Grid and the Project partner will hold additional community meetings, attend block club and other community meetings, solicit the input of local community leaders on how best to reach their constituency, distribute additional collateral, and engage early adopters to spread word-of-mouth information.

3. Customer/Stakeholder Outreach: Phase 2: Enrollment.

Status: [Ongoing]
Enrollment began on April 17, 2016 with the first community meeting. Enrollment will continue until owners of one hundred (100) "solar-ready" houses have committed to being a solar PV host.

Targets/Actuals in Q3 2016:

- Target: Twenty (20) owners sign Access Agreements;
  - Actual: Eleven (11) signed Access Agreements;
- Target: Enroll a total of ten (10) participants as Tier I in Q3 2016;
  - Actual: Ten (10) more participants enrolled in Tier 1;
- Target: Twenty (20) participants sign up for lottery as Tier II in Q3 2016;
  - Actual: A cumulative total of thirty-five (35) account holders will be entered into the bill credit lottery;
- Target: A cumulative total of fifty (50) account holders get referred to NYSERDA as Tier III customers in Q3 2016;
  - Actual: A Memorandum of Understanding ("MOU") between NYSERDA and National Grid, which will include provisions addressing the procedure for making customer referrals to NYSERDA, was not finalized in Q3 2016. Therefore, this activity did not take place during this quarter;

Target in Q4 2016:

- Target: Additional twenty-five (25) homeowners sign an access agreement;
- Target: Additional twenty (20) homeowners enroll as Tier I;
- Target: Additional twenty-five (25) account holders become eligible for the bill credit lottery;
- Target: Provided the MOU has been signed, fifty (50) participants are referred to NYSERDA's EE residential programs, including EmPower New York.

Solutions/strategies in the event results are below expectations:

If the participation levels are below the stated target levels at the end of Q4 of 2016, National Grid and the Project partners will hold additional community meetings, meet with block clubs, distribute

additional collateral, and engage existing homeowner participants to spread word-of-mouth information. If participation levels are low due to additional factors, such as solar PV hosting capability, the Project partners will consider installing solar PV systems on non-profit owned buildings located within the Fruit Belt neighborhood.

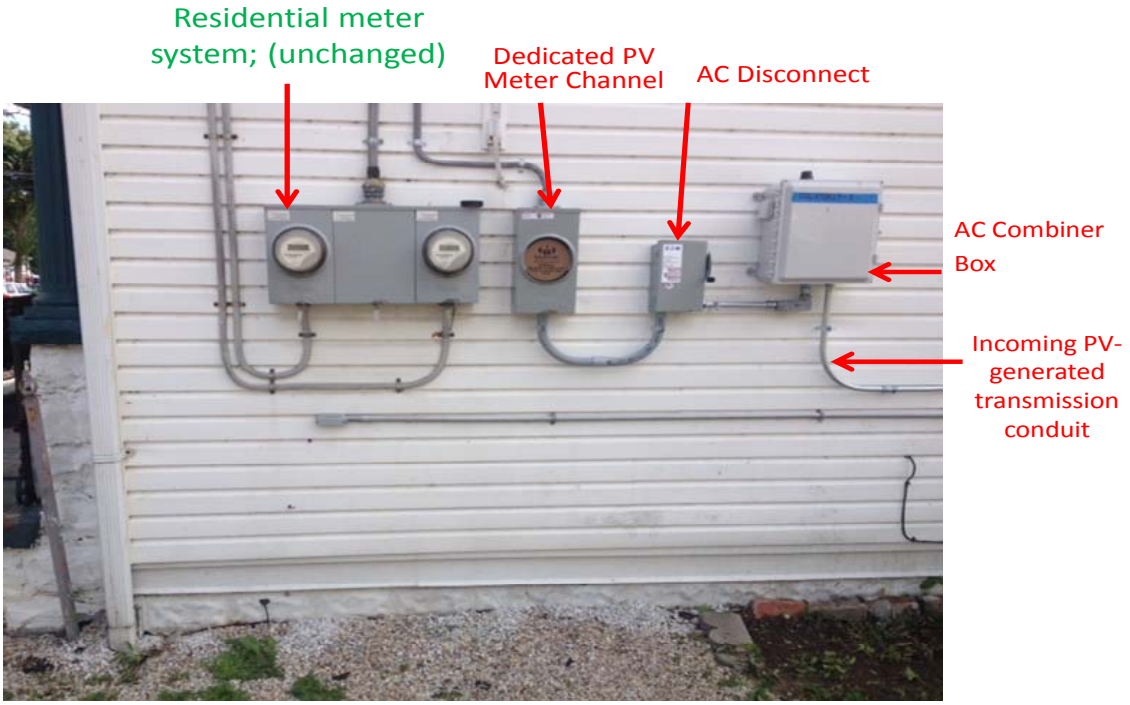

Figure 3-1: Solar PV system equipment configuration downstream of solar PV panels

4. Customer/Stakeholder Outreach: Phase 3: Enrolllment

Status: [Ongoing]
Customer engagement activities continued throughout the solar host approval process for each homeowner who signed up to participate in the program.

Targets/Actuals in Q3 2016:

- Target: Maintain contact with all homeowners enrolled as the houses progress through the review and permitting process.
    - Maintained contact with all homeowners enrolled as the houses progress through the review and permitting process.

Target in Q4 2016:

- Target: Maintain positive engagement throughout the installation scheduling and implementation process with each homeowner throughout the review and permitting process.

Figure 3-2: Installing the second rooftop solar PV system in the Fruit Belt

5. Solar Assessments.

Status: [Ongoing]
Curbside assessments are conducted on each house for which the owner expresses interest, and for which the Google review shows to be viable. This process will be continued until 500 kW of rooftop solar PV systems are installed. Structural assessments, which are conducted following the curbside review and are thus not part of the target/actual evaluation criteria, are conducted by a third-party engineer.

Targets/Actuals in Q3 2016:

- Target: Ten (10) solar PV assessments completed;.
  - Actual: Seventeen (17) assessments got underway; twelve (12) of which were completed;
  - The remaining four (4) home assessments require a new roof; assessments on these can be completed once the roofs are replaced;.

- Target: 100% of solar PV site assessments completed within ten (10) business days of National Grid receiving the completed Access Agreement;
    - Actual: 83% of solar PV curbside site assessments were completed within ten (10) business days of National Grid's contractor, Solar Liberty, receiving the completed Access Agreement; while two were delayed due to scheduling with the home owner.
    - The remaining portion of the site assessments, including the structural review, is not part of this target.

Target in Q4 2016:

- Commence an additional fifteen (15) solar PV site assessments.

Solutions/strategies in the event results are below expectations:

If the solar PV assessment quantity is low due to the contractor's efforts, National Grid will meet with the contractor and request additional staffing resources be placed on the job, and require them to conduct the curbside assessments within 10 days of customer enrollment.

6. Site Selection and Design

Status: [Ongoing]
A solar array design (site plan) is prepared for each residence for which a homeowner expressed interest, and deemed eligible following completion of the curbside solar assessment process.

Targets/Actuals in Q3 2016:

- Target: Design a site plan for all houses owned by residents who express interest in the Project, and which pass the solar screening assessment;
    - Actual: A site plan was completed for each home at which a curbside review was completed and which showed the house to likely be solar eligible.

Target in Q4 2016:

Continue to prepare a site plan for each home at which a curbside review shows the house to likely be solar eligible.

Solutions/strategies in the event results are below expectations:

- It is expected that a site plan can be prepared for those houses owned by residents who express interest, which pass the solar screening assessment, provided there are sufficient remaining business days in the quarter to do so. Houses that meet the screening criteria, but for which there was insufficient time to prepare a site plan within Q4 2016, will have a site plan created in the following quarter.

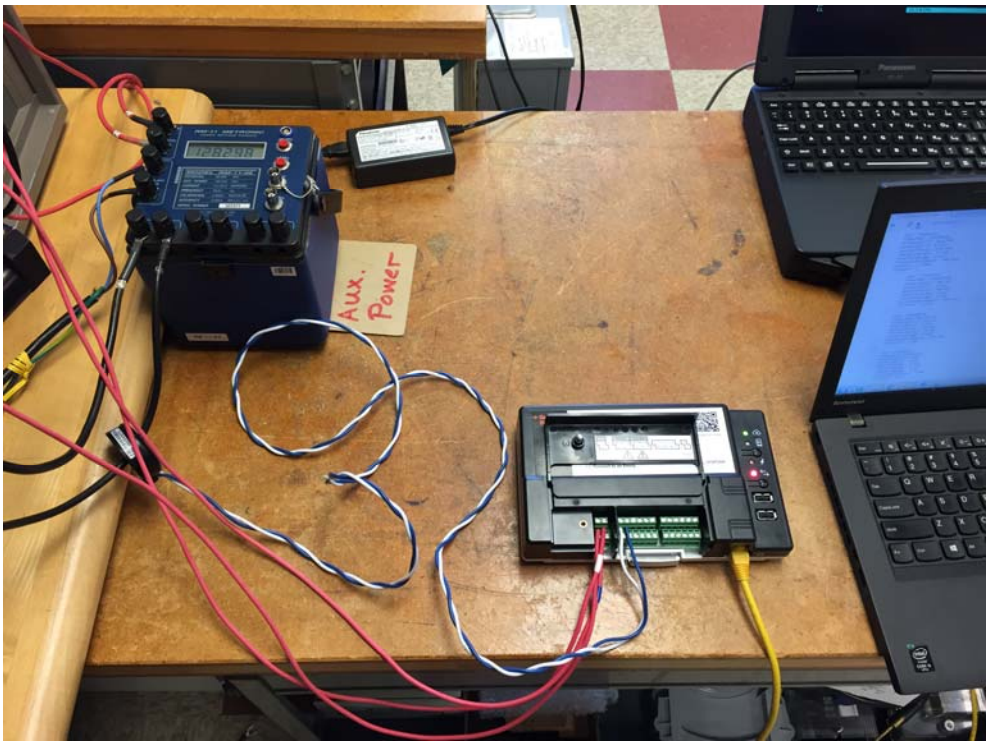

Figure 3-3: Four tests conducted using the Enphase meter showed it met the minimum accuracy required by the ANSI C12.20 standard.

7. Meter Installation.

Status: [(Revised) 12/2016]
A separate meter from the Enphase meter will only be installed on five (5) of the proposed one hundred (100) solar PV systems. These will be installed as a check on the Enphase metering system.

Targets/Actuals in Q3 2016:

- Target: Install one meter at each of the first five (5) solar PV systems installed;
  - Actual: Two (2) solar PV systems were installed; one on each of the two systems installed to date;
- Target: 100% of solar PV panel arrays are connected and being metered within ten (10) business days of completing solar PV system installation;
  - Actual: 100% of solar PV panel arrays were connected within ten (10) business days of completing solar PV system installation.

Target in Q4 2016:

- The remaining three (3) of the five (5) secondary meter systems will be installed;
- 100% of solar PV panel arrays are connected and being metered within ten (10) business days of completing solar PV system installation**.**

Solutions/strategies in the event results are below expectations:

- It is expected that a site plan can be prepared for those houses owned by residents who express interest and which pass the solar screening assessment, provided there are sufficient remaining business days in the quarter to do so. Houses that meet the screening criteria, but for which there was insufficient time to prepare a site plan within Q4 2016, will have a site plan created in the following quarter.

- **In the event results are below expectations:** The Envoy metering is part of the solar PV panel installation. If a solar PV panel system is not active within ten (10) days of installation completion, National Grid will communicate with Solar Liberty and Enphase to determine what is preventing the timely interconnection, and will then address the findings so that all subsequent solar PV systems are active within the ten (10) day timeframe. Delays in installations will be mitigated by implementing lessons learned and anticipating proper lead time for steps, such as obtaining building permits and placing equipment orders

.

Figure 3-4: Use of safety harnesses by all roof workers is one of several safety protocols followed by the contractor's field installation crews.

8. Permitting

Status: [Ongoing]
Solar Liberty strives to submit permit applications to the City of Buffalo within three (3) weeks following receipt of a signed host agreement. The City of Buffalo Building Department staff report that permitting typically takes four (4) to six (6) weeks.

Targets/Actuals in Q3 2016:

- Target: Obtain permit from the City of Buffalo Building Department within two (2) weeks of application submittal;
    - Actual: One (1) permit issued within (two) 2 weeks; one (1) permit was issued within (4) weeks.
    - Actual: Solar Liberty has required up to six (6) weeks to complete a building permit application. This delay resulted from their electrical design contractor missing their

timeframe for preparing the electrical drawing required to be included with each building permit application.

Target in Q4 2016

- Target: Meet with City of Buffalo Building Department to determine what the project team can do in the permit application process to help facilitate the application review process and enable permit issuance within two (2) weeks of application submittal.

Solutions/strategies in the event results are below expectations:

Maintain communication with the City of Buffalo Building Department regarding the rate of Project enrollment, anticipated permit application submittals, and the Department's anticipated workload.

9. Solar Installation.

Status: [Ongoing]
As of the end of Q3 2016 close, two (2) solar PV system installations have been completed.

Targets/Actuals in Q3 2016:

- Target: Install five (5) rooftop solar PV systems;
  - Actual: One (1) rooftop solar PV system was installed;a second system could have been installed had the permitting been completed within the quarter.

Target in Q4 2016:

- Install eight (8) rooftop solar PV systems.

Solutions/strategies in the event results are below expectations:

National Grid will meet with Solar Liberty to identify what issues prevent shorter analysis times and what solutions can be implemented to decrease the turnaround time. If the issue lies with one of their contractors, National Grid will ask Solar Liberty to meet with those contractors to analyze the situation and determine viable solutions to increase the pace of installations.

10. Interconnection

Status: [Revised: 07/16 – 11/17]
Interconnection of e two (2) installed rooftop systems was completed in August 2016. A more streamlined approach for completion of Interconnection was identified. Interconnection within three (3) days of PV solar system inspection by the City of Buffalo is now anticipated.

Targets/Actuals in Q3 2016:

- Target: Connect two (2) solar PV systems to the grid;
  - Actual: Connected two (2) solar PV systems to the grid.

Target in Q4 2016:

- Complete, or schedule for completion, each solar PV system interconnection within five (5) business days of installation;
- Connect all systems installed in Q4 2016.

Solutions/strategies in the event results are below expectations:

- Delays in conducting or scheduling interconnections are not anticipated at this time.

11. Bill Credits Administered.

Status: [(Revised) 08/2016 ongoing]
The billing system to calculate and distribute the billing credit was created in Q1 2016.

Targets/Actuals in Q3 2016:

- Target: Distribute all bill credits for the previous month's solar PV credit using the designed bill credit system;
    - Actual: Monthly bill credits are now being issued for both of the solar PV systems installed and connected in August 2016.

Solutions/strategies in the event results are below expectations:

- Once identified, any issue with the bill credit system will be reviewed and resolved as soon as reasonably possible.

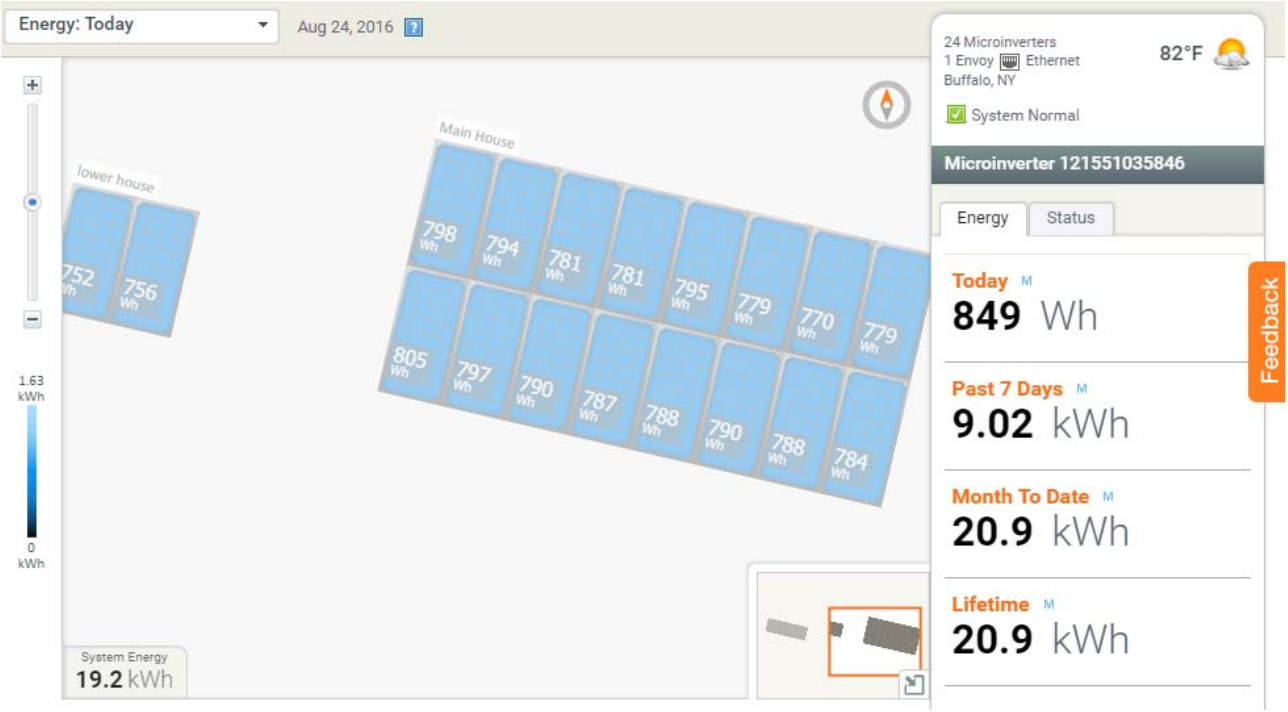

Figure 3-5: The Enphase metering system is capable of reporting the output of each panel at time.

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

Status: [(Revised) Q4 2016]
Solar Liberty worked with BNMC in Q3 2016 to evaluate options for identifying and hiring local employee candidates. A hiring source for eligible candidates was not selected.

Targets/Actuals in Q3 2016:

- Target: One job position identified and posted;
  - Actual: No job postings were prepared during this quarter.

Target in Q4 2016:

- Post one job position and identify eligible candidates.

Solutions/strategies in the event results are below expectations:

The workforce development timeline is in flux due to the uncertainty of staffing needs. Solar Liberty will maintain communication with BNMC to explore hiring alternatives, if the proposed hiring processes prove ineffective for identifying viable, qualified candidates.

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 Q3 2016:

- Target: GE to sign contract with National Grid;
  - Actual: GE executed the contract;
- Target: GE to commence baseline development;
  - Baseline development is planned to commence in Q4 2016.

Target in Q4 2016:

- Hold a contractor contract project kickoff meeting;
- Commence baseline development process.

14. Internal Systems Capability.

Status: [Ongoing]
The toll-free number has been established and activated. Initial internal review for Sanction Paper, an internal document used by National Grid for cost recovery, began in mid-May, 2016.

Targets/Actuals in Q3 2016:

- Target: Complete the Sanction Paper process for establishing the solar PV systems as part of National Grid's rate base;
    - Actual: The Sanction paper was completed;
- Target: Commence preparation of the National Grid internal GE purchase order;
    - Actual: Commenced preparing the GE purchase order;
- Test the bill credit process using actual data generated by the solar PV systems installed;
    - Actual: The bill credit process trial was completed and verified to be working properly.

Target in Q4 2016:

- Complete the National Grid internal GE purchase order.

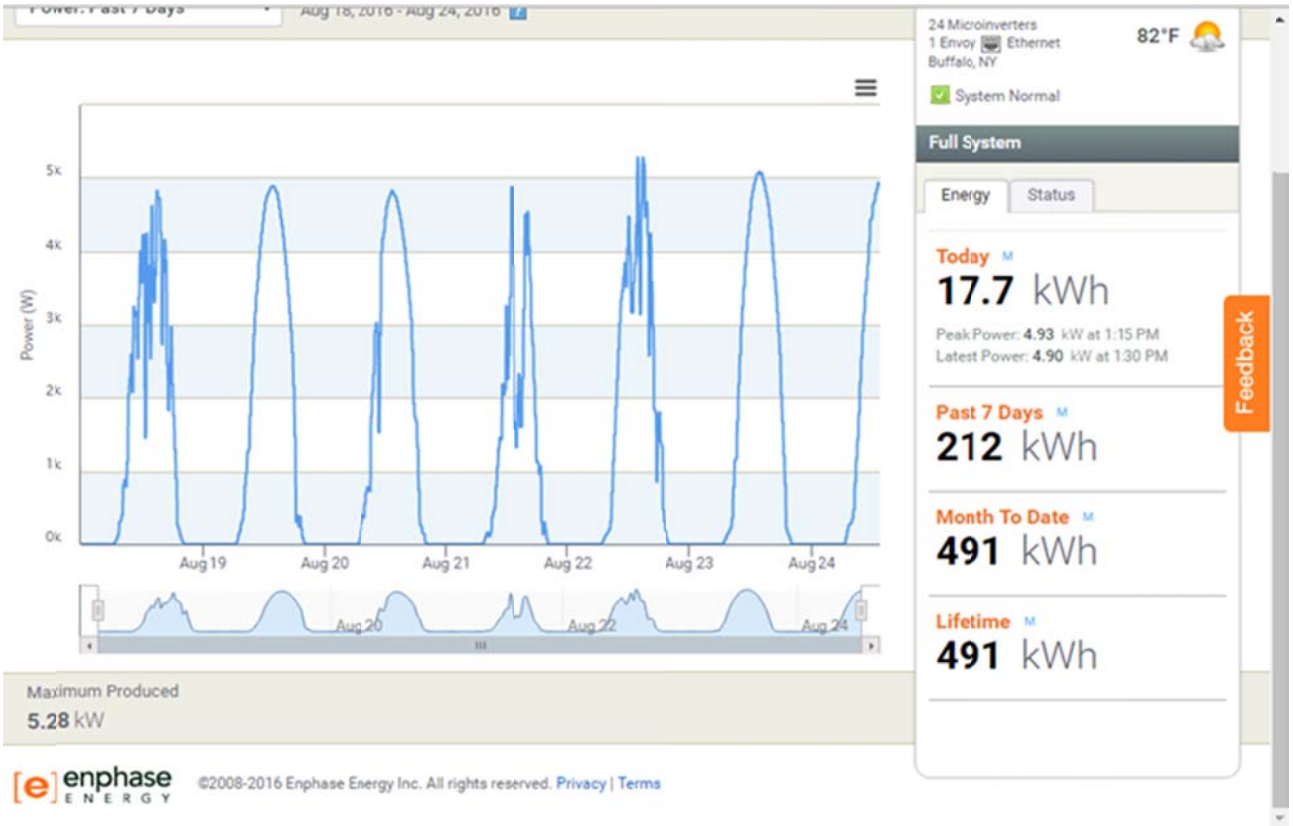

Figure 3-6: The Enphase system provides multiple reporting displays, including a 7-day total daily output graph.

4.0 Work Plan & Budget Review

4.1 Updated Work Plan

The overall work scope and work plan remain unchanged, although some alternative equipment for the solar PV system interconnection may change based on its pending approval. The Project timeline has changed due to the delays previously mentioned in this report.

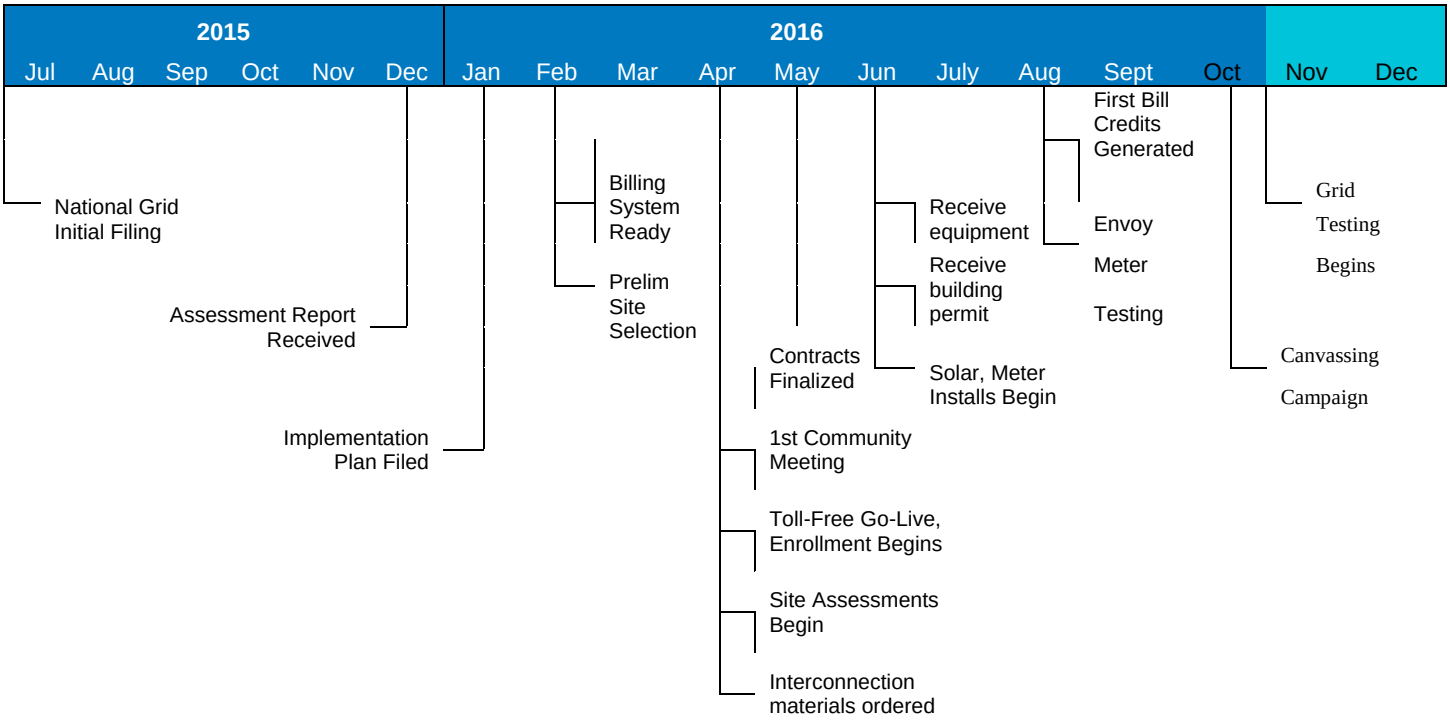

Figure 4.1 – Updated Timeline

4.2 Updated Budget

The following items may impact the budget as they remain unresolved as of the end of Q3 2016.

1. The meter collar proposed for use in this Project is the least costly method of service interconnection and the Project budget was planned based on using the meter collar. As of the end of Q3 2016, its use was still under review by National Grid's Retail Connection Engineering group. The cost increase for using a dedicated service entrance cable instead of the meter collar is $1,152 per house. If a dedicated service entrance cable is needed in addition to a dedicated meter channel, the cost increase over using just a meter collar is $1,537 per house. It was previously decided to install the dedicated meter channel on the first five houses while the Envoy meter was under testing. This resulted in additional material costs of $7,685. If the meter collar is not approved, interconnecting approximately 95 houses using the dedicated service entrance cable will cost approximately $109,440

more than using the meter collar. If the meter collar is not approved, the dedicated service entrance cable will be installed at all participating houses. Note that the approval of the Enphase meter as the sole meter in the solar PV system decreased the additional cost by $36,575.

Solutions:
The following solution is proposed:

- For all solar PV systems not yet submitted for a building permit, suspend solar PV system electrical interconnection design until the meter collar review has been completed. The review is expected to be completed in Q1 2017. This suspension would avoid incurring the additional cost of the dedicated service entrance cable approach while the review is ongoing, potentially saving several thousand dollars should National Grid's Retail Connection Engineering group approve the meter collar.

2. The SIM cards used for data communications incur a monthly fee. This fee was not included in the original budget for the Project. The data plan size is being analyzed under the context of the data needs as demonstrated from the first few solar PV system installations. It is too early in the Project to determine if this will require additional funding, as the actual costs are unknown at this time and cannot be compared to the projected budget. Therefore, a budget increase will not be sought at this time.

3. The allocated amounts for National Grid's tasks are not well matched to the levels of effort they require. However, it is too early in the Project to identify exact dollar amounts needed to accurately re-allocate the Project funds. This evaluation will take place during Q4 2016, as all aspects of the Project, including the system evaluation by GE, will be underway at that time.

The updated Project budget is presented below:

Fruit Belt Neighborhood Solar
Quarterly Budget Status
Q3 2016

Task	Budget	Quarterly Spend	Spend to Date	Expected Completion	Variance
Operational Expenditures					
General Administration and Planning	$ 455,000	$ 33,503	$ 64,466	$ 455,000	$ -
Marketing and Community Engagement	$ 125,000	$ 17,956	$ 58,148	$ 125,000	$ -
Incentives	$ -	$ -	$ -	$ -	$ -
Implementation	$ 1,389,375	$ 650	$ 650	$ 1,389,375	$ -
Evaluation & Analysis	$ 300,000	$ -	$ -	$ 300,000	$ -
Totals:	$ 2,269,375	$ 52,109	$ 123,264	$ 2,269,375	$ -
Capital Expenditures					
100 Solar PV Systems	$ 1,023,000	$ 45,355	$ 43,355	$ 1,023,000	$ -
Totals:	$ 1,023,000	$ 45,355	$ 43,355	$ 1,023,000	$ -
Project Totals:	$ 3,292,375	$ 97,465	$ 166,619	$ 3,292,375	$ -

As previously noted in the Q1 and Q2 2016 reports, the final equipment vendors selected resulted in a lower project material cost. The additional cost of the solar PV panel removal and re-installation during any future roof repairs/replacements, as well as the cost of removing the solar PV panels after twenty-five (25) years of service, will be derived from re-allocating some funds originally budgeted for those material costs. Therefore, a budget increase for future solar PV panel removal/replacement will not be sought at this time.

The incremental costs associated with the Project as of September 30, 2016 total $333,476. Continued monitoring and reporting of incremental costs will be included in subsequent quarterly reports.

5.0 Progress Metrics

Appendix C presents key Project metric tracking data available as of the end of Q3 2016. Note that arrears payment data is not available in this quarter because the first solar PV systems were not installed at locations where customers were in arrears. Additional fields have been added to better display the arrears data once arrears data is generated. Also, tier description fields were added to more accurately reflect true Tier enrollment status.

Appendices

Appendix A: Former Gantt Chart (as presented in Q1 2016 Report)

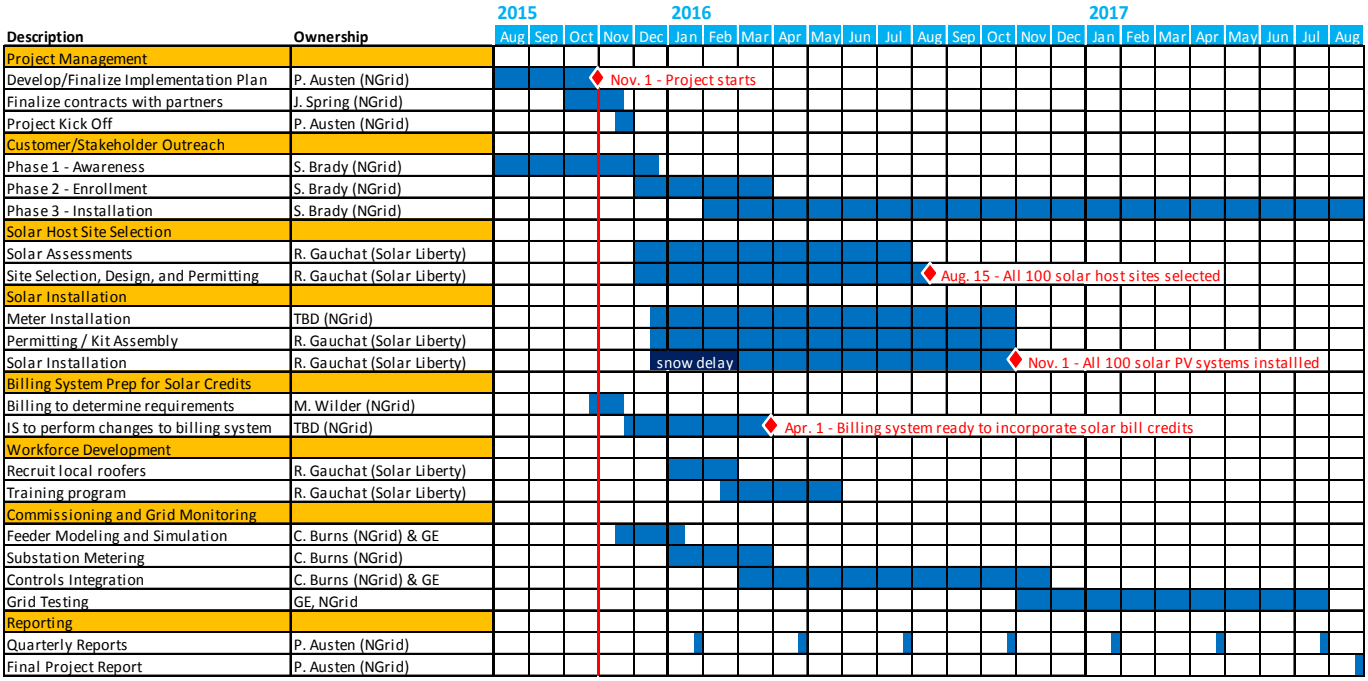

Table A.1 – Q1 2016 Gantt Chart

Appendix B: Updated Gantt Chart (as of the end of Q3 2016)

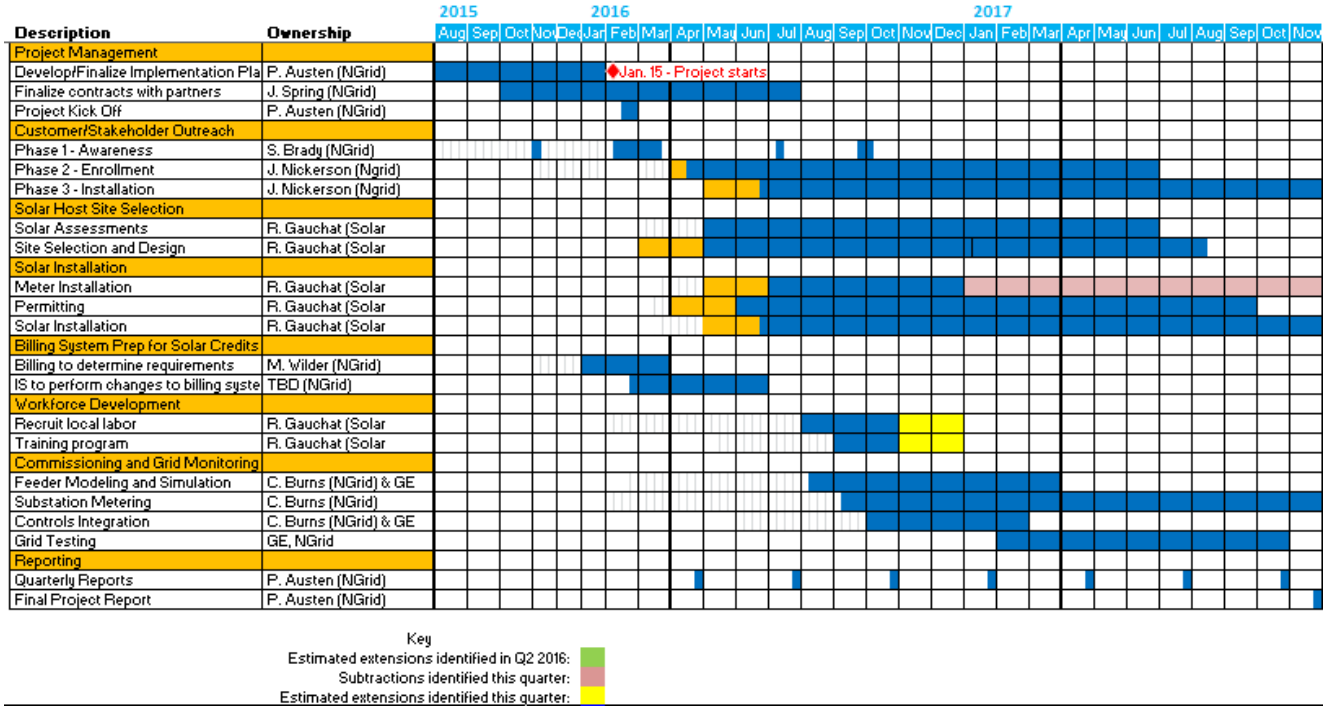

Table B.1 – Updated Gantt Chart

Appendix C: Metric Tracking

	Outreach	Customer Tier						Solar Installation Progress						Generation and Credits								
Quarter	Toll Free Calls Received	Geograph-ically Disqual-ified Calls	Tier 1 Enroll-ment	Tier 1 Eligibility	Tier 2 Enroll-ment	Tier 3 Eligi-bility	Tier 3 Eligi-bility	Program Eligibility Eval	Roof Assess-ment	Structural Assess-ment	Electrical Assess-ment	Rootop Systems Installed	Systems Con-nected	kW on-line	kWh gener-ated	Credits Gener-ated [$]	Credit recip-ients [#]	Average Credit/ recipient [$]	Quarter's Bill Credit Recipient Total Qty	Arrearage Particpant Quantity	Arrearage Particpant Rate	Arrearage Participant Rate Change
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	$0.00	0	$0.00	0	0	0	0
2	34	0	1	5	0	14	14	17	14	10	14	1	0	0	0.00	$0.00	0	$0.00	0	0	0	0
3	28	2	1	10	0	16	16	16	26*	9	5	1	2	12.22	2,408.11	$0.00	2	$17.06	2	0	0	0
4																						
5																						
6																						
7																						
8																						
Totals:	62	2	2	15	0	30	30	33	14	19	19	2	2	12.22	2,408.11	$0.00	2					

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

Table C.1 – Metric Tracking table

Appendix D: 8/18/16 Op-Ed Article

The following article was published in *The Buffalo News* on August 18, 2016.

http://buffalonews.com/2016/08/18/solar-project-near-the-medical-campus-benefits-both-national-grid-and-area-residents/

Solar project near the Medical Campus benefits both National Grid and area residents

- ***By Staff***
- *Published August 18, 2016*

Cost savings from innovations should not be restricted to the well-heeled.

People who can afford all the latest gadgets and expensive connections have tended to gain the most.

Think: When costs go up, computers and high-speed internet connections become unaffordable for many low-income households, widening the digital divide. The ability to leverage such technology shows up in educational and career advantages.

Now comes along a program that allows a segment of the community with modest means to lead the way. The best part is that it is not some bureaucratic governmental enterprise.

National Grid has launched a $3.7 million project that intends to install as many solar arrays as needed to generate 500,000 kilowatts of electricity within a neighborhood slightly east of the Buffalo Niagara Medical Campus. The goal is to install solar systems on 100 homes.

As reported in The News, the company wants to "measure whether the additional local generating capacity can help it avoid making other investments in its power grid and improve its reliability."

So far the information gathered is hopeful, especially to residents like Schuyler Banks, a former National Grid supervisor who now teaches at Erie Community College. He had solar panels installed on his mother's home on Lemon Street in the Fruit Belt – a 5-kilowatt rooftop system that represents the demonstration project's first installation.

One of the key benefits as the project expands throughout the neighborhood is that the power generated by the rooftop arrays will be sold into the state's electricity market. The money will then be used to reduce the 100 residents' power bills, in addition to those of another 50 homeowners in the neighborhood who applied to be in the program but whose homes were not suited for rooftop energy.

It may not seem like a lot of money given that the expectation is a reduction in electricity bills of $17 to $20 a month for those 150 households. But every little bit counts. That is especially true in communities in which utility costs can consume a good portion of modest incomes.

The company has indicated the demonstration project's benefit is also in showing that it could be duplicated. Credit goes to National Grid and the Buffalo Niagara Medical Campus, which is partnering with the company on the project.

It brings in a segment of the population that might otherwise be left out of the renewable energy conversation. The Medical Campus stands to benefit from the prospect that the neighborhood arrays could meet the demand for the nearby campus. And, of course, National Grid could benefit by not having to invest sums of money in new substations or equipment.

Renewable solar energy powering a low-income neighborhood and nearby Medical Campus in a clean way that does not pollute the environmental while meeting free market demand: It's a win all around.