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Senior Counsel II

July 1, 2015

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)

Proposed REV Demonstration Projects

Dear Secretary Burgess:

In accordance with the requirements set forth in the Memorandum and Resolution on Demonstration Projects issued by the Commission on December 12, 2014 in Case 14-M-0101 and the Order Adopting Regulatory Policy Framework and Implementation Plan issued by the Commission on February 26, 2015 in Case 14-M-0101, Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid") hereby submits for filing its proposed REV Demonstration Projects.

Please direct any questions regarding this filing to:

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As described within the Clifton Park Demonstration Project of this filing, National Grid will be filing petitions with the Commission for two discrete elements of that proposed project requiring Commission authorization to proceed as currently planned.

National Grid looks forward to working collaboratively with Department of Public Service Staff to advance the Company's demonstration projects to implementation.

Respectfully submitted,

/s/ Janet M. Audunson

Janet M. Audunson, P.E., Esq.
Senior Counsel II

Enc.

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National Grid Proposed REV Demonstration Project Filing

Case14-M-0101- Reforming the Energy Vision (REV)

July 1, 2015

Niagara Mohawk Power Corporation
d/b/a
National Grid

Submitted to:

New York
Public Service Commission

Table of Contents

Executive Summary

REV Demonstration Project Intention

With its Track One Order, the New York State Public Service Commission (the "Commission") directed utilities to develop and file initial projects to demonstrate business models and customer engagement that align with the values and outcomes encouraged by Reforming the Energy Vision (REV). The core outcomes identified by REV include[1]:

1. Enhanced customer knowledge and tools that will support effective management of their total energy bill;
2. Market animation and leverage of ratepayer contributions;
3. System wide efficiency;
4. Fuel and resource diversity;
5. System reliability and resiliency; and
6. Reduction of carbon emissions.

The Commission believes that the demonstration projects "will be an important step in implementing the expected REV policy changes and will inform decisions with respect to developing Distributed System Platform (DSP) functionalities, measuring customer response to programs and prices associated with REV markets, and determining the most effective implementation of Distributed Energy Resources (DER)." [2] Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") agrees on the importance of the demonstrations, and that "These projects are also a means of presenting REV to the customer and gauging their receptiveness to REV technologies, products, and services." [2] Projects will be designed to be deployed under an immediate timeline with an eye toward scalability if deemed successful in accordance with their associated metrics." Data collected from these projects will inform regulatory changes, rate design, and the most effective means to integrate DER on a larger scale." [2] By launching a set of REV demonstration projects across the National Grid service territory in New York (Figure 1), National Grid will be able to test a range of solutions across many of its major customer segments and geographies. This comprehensive approach will support the Commission's REV policy objectives while engaging customers on the journey towards the future of energy in New York.

Figure 1: National Grid Proposed REV Demonstration Project Sites

[1] Case 14-M-0101 - *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*. Order Adopting Regulatory Policy Framework and Implementation Plan. (Issued February 26, 2014)
[2] Case 14-M-0101 - Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision. Notice Encouraging Development Of Demonstration Project Proposals. December 2014.

Customers and the Evolving Role of the Utility

Upstate New York is home to a diverse array of people, businesses, institutions, and geography. National Grid is directly connected to its diverse customer base, positioning the Company to provide information and simple, convenient solutions for individual customers and communities that benefit all customers and advance REV objectives such as system optimization and carbon reduction. National Grid believes that the utility-customer relationship is essential to achieving mass adoption of energy efficiency, demand response, and other DER in order to accomplish the ambitious targets set forth in the State Energy Plan[3].

The chart below (Figure 4: Participating Customer BreakdownFigure 2) further distinguishes the National Grid electric customer base in New York by providing a snapshot of customers by number of accounts and types of customer facilities.

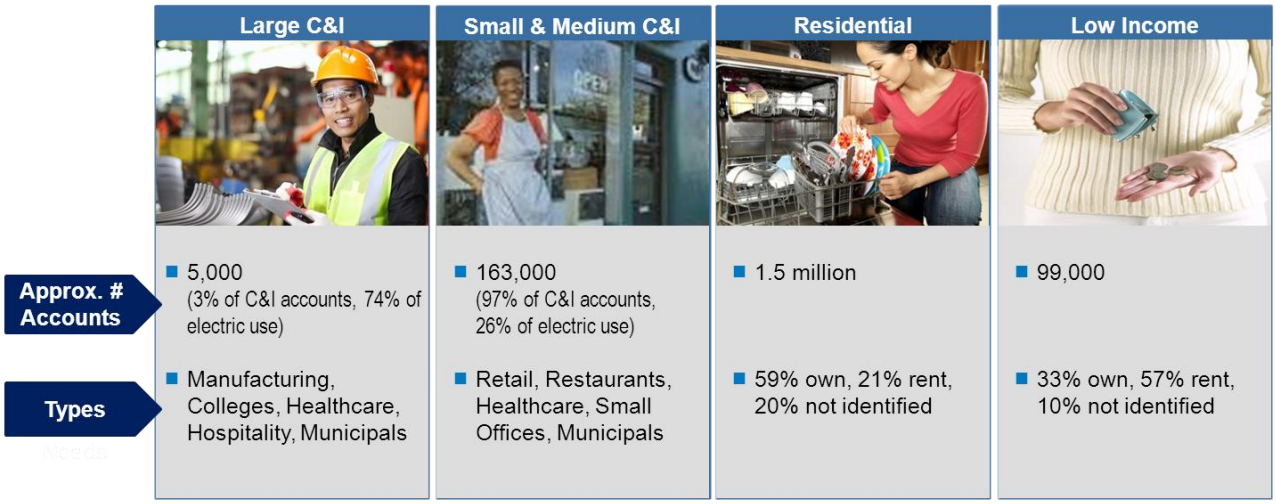

Figure 2: National Grid Diverse Customer Base in New York

To help better understand the NY customer base, the Company conducted over a thousand online surveys within the New York service territory.[4] These studies indicated that, while affordability, reliability and safety remain important table stakes for our customers, an expanded range of needs such as convenience, information, control and others are becoming increasingly relevant. It is also reasonable to infer that customers' expectations are increasing based on their interactions with other industries, which have been leveraging technology and big data to provide continuously improving customer experiences. While most customers expressed interest in greater levels of choice, overloading customers with too many options can result in decision inertia.[5] New solutions need to simplify customers' everyday lives in order to lead to widespread

[3] 2015 New York State Energy Plan.
[4] National Grid,*Value Proposition Research: A Study of 3 Energy Solution Areas for New York*, 2014.
[5] Behavioral science research on choice overload helps illustrate this point. A well-known field experiment (Iyengar, Sheena S. and Mark R. Lepper, "When Choice is Demotivating: Can One Desire Too Much of a Good Thing?" Journal of Personality and Social Psychology, 2000, Vol. 79, No. 6, 995-1006) on specialty jams arranged at a grocery store showed that 60% of customers approached the jam sampling booth when offered 24 flavors compared to 40% when offered 6 varieties; however, 30% of those offered the limited selection purchased a jar of jam in contrast to 3% of those offered the extensive assortment.

adoption.[6] Finally, while energy plays a vital role in customers' lives and businesses, it does not necessarily remain top-of-mind for customers. A recent industry report found that over half of consumers surveyed had not interacted with their utility provider over a twelve month period,[7] illustrating a persistent engagement gap.

The engagement gap could be addressed by converting the mass market to active energy enthusiasts or by utilizing the newly available tools provided by technology and intelligent automation to enable passive customer engagement. National Grid believes that enthusiasts, expected to continue as a minority, as well as all customers, should be provided with relevant, actionable information to support their engagement. The Company believes the majority of customers, however, are best activated utilizing a trusted utility brand, intelligent automation, and three decades of behavioral science[8] that help explain why, for example, there remains so much untapped energy efficiency potential[9] despite investing in efficiency being the economically rational decision. Simple, convenient solutions coupled with optimal defaults and choice architecture could facilitate better customer decision-making, closing the mainstream action gap and unlocking individual and collective value creation. National Grid's market research was consistent in suggesting an expanded utility role, concluding that customers expect National Grid to serve as a key information and solution provider across energy management services, customer generation and storage of electricity, and installation/provision of plug-in electric vehicles charging services. [10]

Internally, National Grid has embarked on a journey of its own, starting with the development of its "Connect21" framework before the launch of REV and continuing with the announcement of its New Energy Solutions team in the week preceding this filing. Much like REV, Connect21 creates a framework that links customer needs and policy goals with technology and market solutions.[11] Regarding environmental policy, National Grid has made ambitious commitments of its own to reducing greenhouse gas emissions: 45% by 2020 and 80% by 2050.[12] Learnings from the REV Demonstrations will help to inform the way in which National Grid works as a company and with our customers to help achieve aggressive greenhouse gas reductions. The New Energy Solutions team will serve to accelerate the innovation, partnerships, and market animation required to deliver on both customer needs and policy objectives.

To gain further knowledge specific to each proposed demonstration project site, members of the New Energy Solutions team, along with the Jurisdictional teams in the respective communities, are leading and participating in community meetings and town halls as well as individual discussions through stakeholder meetings and home visits. National Grid's initial and ongoing REV demonstration projects will continue these important conversations and translate them into

[6] OPower, "Five Universal Truths About Energy Consumers," 2013, pg. 7-8.
[7] Accenture, "Actionable Insights for the New Energy Consumer," 2012
[8] Thaler, Richard H." Unless You Are Spock, Irrelevant Things Matter in Economic Behavior." The New York Times. Web. 8 May 2015.
[9] NYSERDA." Energy Efficiency and Renewable Energy Potential Study of New York State." April 2014.
[10] National Grid National Grid, Value Proposition Research: A Study of 3 Energy Solution Areas for New York, 2014
[11] National Grid Connect21 Framework, http://us.nationalgridconnecting.com/connect21/
[12] National Grid, Environmental Policy, September 2013. https://www.nationalgridus.com/non_html/shared_env_policy.pdf

near-term action. Multiple hypotheses will be tested to learn how best to address customer needs and deliver simple and convenient solutions for the 21st century.

Proposed Demonstration Projects

National Grid will be conducting a portfolio of REV Demonstration projects across the New York service territory. Due to the varied NY customer base (Figure 2), National Grid plans to test a range of hypotheses to offer a range of solutions to customers through the REV framework. This integrated suite of demonstration projects aims to understand the needs of the customer base and identify appropriate solutions to meet these needs using cost effective, scalable models. Each demonstration project will include specific hypotheses and metrics to define and determine success to justify scalability across the service territory as appropriate. As a whole, these demonstration projects explore the integration of distributed resources, resiliency, and customer convenience across representative regions of the National Grid service territory in New York. National Grid plans to remain agile and flexible in the pursuit of these initial demonstration projects and anticipates further expansion and evolution of the initially proposed projects within this filing.

Integration of Distributed Resources

Within the Buffalo-Niagara Medical Campus (BNMC), National Grid will work with partners to launch a demonstration project with two branches testing an in-front-of-the-meter neighborhood solar model in an underserved, low-to-moderate income market as well as a first step distributed services platform (DSP) including dynamic load management. Both of these initiatives will test hypotheses to help National Grid further refine a working definition for the Distributed System Platform (DSP) framework and help the Company transition smoothly to this evolving role under REV.

Distributed System Platform (DSP)

Within the BNMC, a demonstration project will test the ability and customer willingness to manage the BNMC's portfolio of DER assets based on BNMC's priorities with respect to reliability, cost, and sustainability within a simplified DSP framework. This test aims to understand how DERs can be optimized to maximize economic value (savings, avoided spend, and revenue) and reliability. The management platform will manage DER assets through forecasts of load and generation to create a dynamic, forward-looking dispatch schedule that meets the BNMC's requirements. Lessons learned from this demonstration project will allow National Grid to determine the types of scalable solutions to connect customer-to-grid assets to functional market mechanisms that do not currently exist (e.g., ancillary services, capacity, demand response, etc.)

Neighborhood Solar

The Fruit Belt Neighborhood Solar demonstration project will test the benefits resulting from integration and development of an in-front-of-the-meter, concentration of PV solar within an

under-adopting, low-income neighborhood. This demonstration project will assess potential methods to increase solar penetration within a neighborhood currently underserved by markets. Solar represents arguably this era's most disruptive technology as its price has dropped ninety-nine per cent in the past four decades making it now capable of producing power at "grid parity" nearly as cheaply as coal or gas [13] in certain situations. A successful implementation will lead to reduced customer arrears and mitigation of the impact of bad debt on all ratepayers. In addition, the demonstration project will examine ways to improve grid efficiency through the use of energy efficiency technology and local solar generation. This effort may show the ability to reduce energy losses, provide improved voltage control, and effective DER integration.

Resiliency

Across the National Grid service territory, severe weather events persist, in some cases leading to widespread and sustained outages. Located in the North Country of New York, Potsdam represents an example of a community that has been impacted by both microbursts in the summertime and ice storms in the winter, leading to multi-day outages. Consequently, the demonstration project will test customer interest along with business-model feasibility of a community microgrid solution linking critical facilities, essential services, and local distributed generation. The scope of this first phase of the project is focused on developing a stakeholder and business model framework, culminating in a go/no-go decision whether to proceed with the community microgrid. With a "go" decision, not only will customers in the Potsdam area stand to benefit, but also communities across the National Grid's territory will have the potential to benefit due to the intended scalability of the solution.

Customer Convenience

The Town of Clifton Park represents a growing suburban region of the capital district. Despite available energy options, residential customers often lack an easy path to adopting advanced energy options due to resulting bill and payback uncertainty. Through this demonstration project, National Grid will work with the community and partners to overcome market barriers to DER adoption and increase customer choice and value. National Grid, in collaboration with strategic business partners, will enable these transactions by bundling DER services and products on customers' energy bills. Customers participating in this program will be offered improvements that will result in lower long-term energy costs and levelized bills to make their electric and gas bills more predictable while overall network load growth will be managed more efficiently through the increased adoption of customer DER, the integration of state-of-the-art smart and efficient home appliances, and grid devices that reduce demand and energy consumption to all customers. This demonstration project will prove essential in planning for future areas similar to Clifton Park with growing populations and a need to manage associated load growth.

[13] McKibben, Bill." Solar Power for Everyone." The New Yorker. Web. 24 June 2015.

Anticipated Outcomes

Successful implementation of the REV Demonstration projects will position National Grid to help create the future of energy in New York as described by REV. The described demonstration projects, with innovative partners, are expected to engage customers and communities, consider market rules and standards, and create customer and system benefits cost effectively—all within reasonable timeframes. By achieving these criteria, National Grid will succeed in learning how to scale these solutions in order to create new utility business models, thus improving economic value for the State (Figure 3). National Grid cannot deliver these solutions in a vacuum. Working closely with customers, peer utilities, third parties, the State, and other stakeholders is essential throughout this transformative process. Launching these initial REV Demonstration projects will be the first bold step in the direction of a cleaner, stronger energy future for the state of New York.

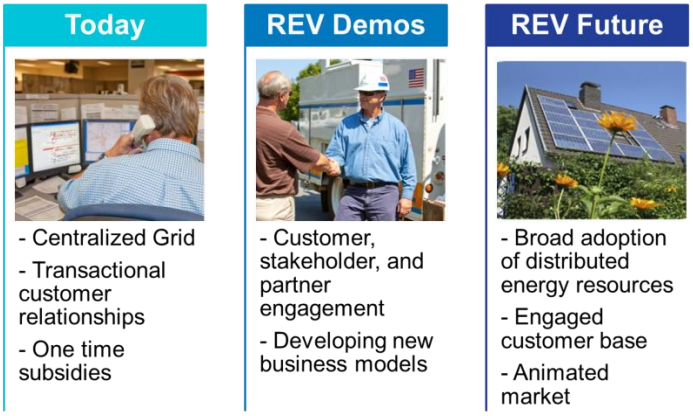

Figure 3: REV Demonstration Anticipated Outcomes

Fruit Belt Neighborhood Solar Demonstration Project Proposal

Buffalo Niagara Medical Campus (BNMC)

Niagara Mohawk Power Corporation d/b/a National Grid

July 1, 2015

Executive Summary

This Reforming the Energy Vision ("REV") demonstration project described herein is submitted by Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") with the Buffalo Niagara Medical Campus ("BNMC" or "Campus") as its customer partner.

This demonstration project focuses on one of the three neighborhoods that border the Campus proper, the Fruit Belt Neighborhood. In an effort to bolster the neighborhood's strengths and to build a replicable model, the proposed Fruit Belt Neighborhood Solar Demonstration Project seeks to engage and benefit a largely low-to-moderate income ("LMI") neighborhood through the installation of 100 residential solar photovoltaic ("PV") systems on a subset of homes, which will be screened through both a combined structural/roofing, solar viability assessment, and comprehensive home energy audit conducted by local contractors. The comprehensive home energy audit will meet the specifications set by the New York State Energy Research and Development Authority's ("NYSERDA") Green Jobs – Green New York program and will utilize project funding designated for home energy health and safety measures. For the 100 host sites that are ultimately selected, additional project funding will also be available to address minor to moderate structural issues and electric service panel replacements that may present a barrier to customer participation in the demonstration project. While other solar PV systems could be deployed, this demonstration project seeks to utilize the General Electric ("GE") 5 kW micro-inverter system developed at their Niskayuna, New York research facility in part through a NYSERDA Program Opportunity Notice ("PON") 1772 award.[14]

The energy produced by these solar PV units will be captured in front of the utility meter, aggregated collectively, and monetized. The resulting revenue, in its entirety, will then be redistributed equally amongst a larger group of neighborhood residential electric accounts. As a result, neighborhood residents will see a very tangible reduction in their electric bills as a direct result of this demonstration project's solar PV system installations.

In order to pass the full monetary benefits of this LMI neighborhood deployment of rooftop solar PV back to residents, where the marketplace is not likely to satisfy this need, and to realize the maximum benefit to the electric distribution system and other utility customers, this demonstration project will utilize utility ownership as an alternative to the traditional third-party Power Purchase Agreement ("PPA"). This model will not require an initial investment on the part of participating homeowners or tenants, or the larger community as a whole, for the demonstration project's equipment, installation or maintenance.

Through encouraging greater distributed energy resource ("DER") adoption within a concentrated geographic area and along a common electric feeder – and through the use of equipment to monitor and control power factor,[15] this demonstration project also seeks to test if

[14] The title of this PON was "Next Generation Emerging Technologies for End Use Efficiency." This system was successfully demonstrated at National Grid's Henry Clay Boulevard facility in Syracuse, New York.

[15] Power factor is calculated using two inputs: true (or real) power and apparent power. True power represents the power used by reactive loads to perform work expressed in kW. Apparent power accounts for not only true power but also reactive power in kVA. Reactive power categorizes non-working power – or the power required to

greater electric distribution system efficiency can be accomplished through: (i) reduction of energy losses; (ii) improved voltage monitoring and control; and (iii) the monitoring and control of reactive power.

Business Model Overview

The Market Opportunity

This demonstration project works with an economically-distressed area that outside of the business model presented here will not be in a position, nor motivated, to participate in such a market opportunity or to effectively contribute towards electric distribution system efficiency. LMI urban areas that typically stand to benefit the most from lower electricity prices traditionally under-adopt customer-sited distributed generation and energy efficiency measures. As stated within the New York State Energy Plan, "…low- to moderate-income ("LMI") consumers pay a disproportionate share of their income toward the cost of energy. These consumers also are less likely to be reached in the near term by clean energy market actors and project developers because of perceived credit risks." [16]

As acknowledged in a recent report published by the Center for American Progress, if financial and tenantship barriers to greater solar adoption among Low-to-Moderate Income communities are not eased, the existing "electrical divide" stands to grow wider, as these consumers stand to bear the brunt of the cost of outdated utility systems.[17]

Proposed Solution

This demonstration project proposes a neighborhood solar PV program that seeks to benefit a larger subset of electric customers within the community boundary through a select deployment of 100 residential solar PV installations.

Specifically, the goals of the demonstration project are to:

- Accelerate the neighborhood's adoption of DER in an innovative way
- Create multiple benefits to the Fruit Belt neighborhood community
- Ensure scalability elsewhere in the State
- Test the effectiveness of utility ownership of distributed generation ("DG") in engaging low-to-moderate income communities such as the Fruit Belt neighborhood.

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maintain the magnetic field (or ready-state) - necessary to perform work. By dividing true power by apparent power, the power factor is calculated. In a perfected system, a power factor of 1. 0 – or unity - would be achieved if all the energy produced would be consumed in its entirety by the load. In contrast, a power factor between 0 and -1 would indicate that the power produced is not being consumed by the load and is consequently flowing back to the utility electric system.

[16] The New York State Planning Board, "The Energy to Lead: 2015 New York State Energy Plan Volume 1", p.39.

[17] See Ben Bovarnick and Darryl Banks, "State Policies to Increase Low-Income Communities' Access to Solar Power", Center for American Progress, September 23, 2014. http://www.americanprogress.org/issues/green/report/2014/09/23/97632/state-policies-to-increase-low-income-communities-access-to-solar-power/.

Hypothesis Tested

Given:

- The high rate of arrears among National Grid's Upstate New York LMI customers and the impact of bad debt on the customer rate base[18]
- Low solar PV penetration among low-income residential customers[19]
- Potential for greater electric distribution system efficiency and lower energy costs for all customers by correcting the power factor to decrease electric distribution system energy losses, improving voltage control, and monitoring and control reactive power.

The demonstration project seeks to test if the proposed project structure can effectively address this existing low-income market failure and provide benefits to all utility customers through lowered bad debt and greater electric distribution system efficiency.

REV Demonstration Project Principles Addressed

The Company anticipates that this demonstration project will meet all of the following REV demonstration project criteria:

3rd party partners	New Utility Business model	Customer-Community Engagement	Identify Economic Value	Pricing and Rate Design	Transactive Grid	Scalability	Market Rules and Standards	Cost Effective	Timeframe
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

This demonstration project further supports the stated goals and objectives of the Commission's REV Demonstration Criteria including;

- Enhanced customer knowledge and tools that will support effective management of their total energy bill;
- Market animation and leverage of ratepayer contributions;
- System-wide efficiency;
- Fuel and resource diversity;
- System reliability and resiliency, and;
- Reduction of carbon emissions.

The Commission's February 26, 2015 Order Adopting Regulatory Framework and Implementation Plan ("REV Track One Policy Order")[20] stated that utility ownership of DER will only be allowed under certain discrete circumstances, which includes "a project that will

[18] Within the 2012 Electric Rate Case for Niagara Mohawk Power Corporation, National Grid cited a total debt figure of $42.6 million for its Historic Test Year. *See* Cases 12-E-0201 and 12-G-0202 Proceeding on the Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Niagara Mohawk Power Corporation for Electric and Gas Service, Testimony and Exhibits of the Shared Services and Customer Panel Exhibits __ (SSCP-1) – (SSCP-13), at p.28.

[19] *See* Christophe Jospé, Curtis Probst, Mara Elana Burstein, Tiancheng Deng, Erica Helson, Chanelle Mayer, Kim Palacios, Igor Valdebenito, Kirstin Verriest, and Bora Youn, "Ensuring New York Solar Program Reach Low-Income Residents," Grid Alternatives, Spring 2014, http://mpaenvironment.ei.columbia.edu/files/2014/06/GRIDAlternativesProject.Final.pdf

[20] Case 14-M-0101 – *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV Proceeding"), Order Adopting Regulatory Policy Framework and Implementation Plan ("REV Track One Policy Order") (issued February 26, 2015).

enable low or moderate income residential customers to benefit from DER where markets are not likely to satisfy the need or where a project is being sponsored for demonstration purposes."[21] This demonstration project satisfies the narrow circumstances under which utility ownership of DER is allowed.

Market Attractiveness

Unique Value Proposition

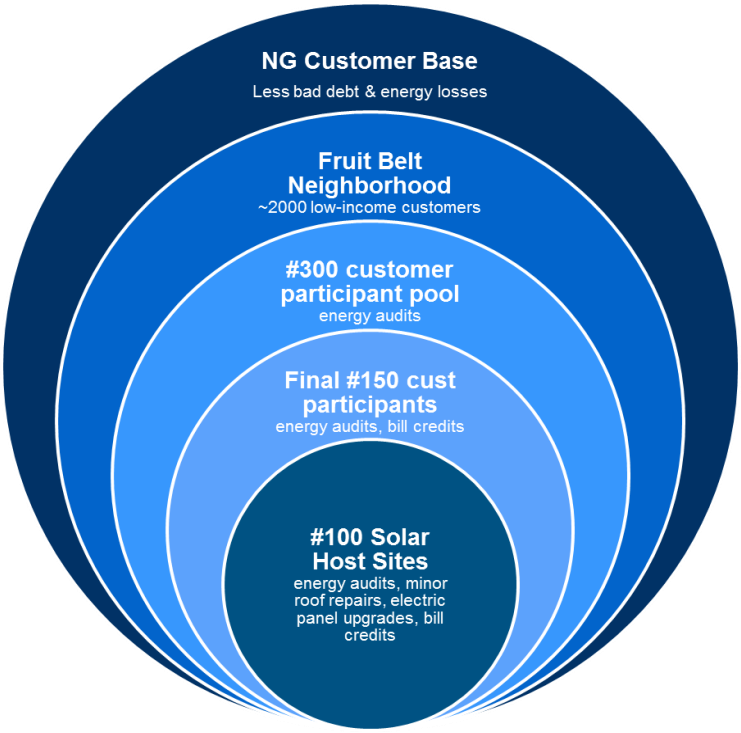


Figure 4: Participating Customer Breakdown

Participating Customers: Monetary Benefits

In order to estimate the expected monetary benefits to the demonstration project's participants, the project's Performance Assessment is based on the following assumptions:

- The total monetary credit for the generation produced by all 100 solar PV units will be shared by 150 active, residential electric account holders and will appear as a credit on their respective monthly bills.[22]
- For each kWh of supply commodity (solar PV generation), the monetary compensation will equate to the 12-month average period ending April 2014 SC6 rate of $0.051231/kWh.
- The average, monthly output for each 5 kW unit is 526 kWh per month.[23]

[21] *Id.*, at p.70.
[22] See "Participation" for selection criteria and details
[23] *See* Appendix - "NYSERDA Residential Solar Electric System Performance Tracking (203 Oxford Way Niskayuna, NY)" for further detail.

Average Total Supply Commodity Credit (assuming $0.051231/kWh)	
Per Unit	$26.95/month
For 100 Units	$2,694.75/month
Per Customer Participant (150 total)	$17.97/month

Table 1: Average Total Supply Commodity Credit

It should be noted, and considered, that a different service classification could be utilized, or created, to reflect that the demonstration project's metering configuration does not qualify as net metering given that the generating facility is in front of the meter and the full benefits of the solar PV generation will be realized by the electric distribution grid.

The Supply Service Charges for SC1 in New York Independent System Operator ("NYISO") Zone A have averaged higher than the 12-month average SC6 rate, as illustrated in Table 2 below. If the average Supply Service Charge was instead utilized as the monetary compensation for the demonstration project, the monthly bill credit per participating customer within the demonstration project area will increase from $17.97/month to $23.92/month.

Billing Months of December 2013 - December 2014	
Billing Month	**Billed Rate**
Dec-2013	$0.06023
Jan-2014	$0.07123
Feb-2014	$0.11013
Mar-2014	$0.08020
Apr-2014	$0.05780
May-2014	$0.06628
Jun-2014	$0.06996
Jul-2014	$0.08045
Aug-2014	$0.06154
Sep-2014	$0.05721
Oct-2014	$0.05845
Nov-2014	$0.05072
Dec-2014	$0.06260
Average Supply Service Charge	*$0.06822*

Table 2: NMPC Supply Service Charges for SC1- NYISO Zone A

Energy Efficiency Benefit to Program Participants

In addition to tangible monetary benefits, demonstration project participants will also benefit from project funding that is designed to supplement existing New York State-approved weatherization measures such as air sealing, electric base load reduction measures, and health and safety hazard mitigation. Project funding designated for comprehensive home energy audits that include minor-to-moderate structural repairs and electric service panel replacements, in particular, will address a need that is currently outside of the scope of the State's approved

weatherization program.[24] These additional measures are intended to not only address potential barriers to customer participation in the demonstration project but to also maximize the opportunity that the demonstration project presents to address health, safety, and energy efficiency with an engaged customer group over an extended period of time.

Mitigation of Bad Debt and Net Write-Offs

Bad debt affects all utility customers as such costs are recovered through rates. As stated in the testimony by National Grid's Shared Services and Customer Panel during its most recent rate case for in 2012, the total incurred uncollectible accounts expense (or net write-offs) for the 2011 Historic Test Year equaled $42.6 million or 1.271 percent of retail sales.[25]

As a favorable impact on bad debt, the bill credits incurred on demonstration project participants' bills – similar to National Grid's Low Income Discount Program for its HEAP-eligible customers that provides a $5.00 monthly credit for electric, non-heating customers, will help participants to manage their electric bills and arrears. As the average monthly bill for SC1 residential customers in NYISO Zone A is $90.38 (Table 3: National Grid, "Typical Load Zone Bill through January 2015"), the projected $17.97 monthly bill credit for demonstration project participants equates to an approximate savings of 20% of the total monthly electric bill. The total bill savings will increase to 25% for demonstration project participants who quality for National Grid's Low Income Discount Program.

SC-1 Residential Customer - 600 kWh

	West (Zone A)													
	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15
Delivery [1]	$ 48.88	$ 48.31	$ 50.62	$ 44.89	$ 53.65	$ 51.85	$ 50.06	$ 48.69	$ 48.80	$ 48.05	$ 47.96	$ 47.98	$ 48.44	$ 48.46
Supply related charges:														
Supply Cost	$ 36.14	$ 42.74	$ 66.08	$ 48.12	$ 34.68	$ 39.77	$ 41.98	$ 48.27	$ 36.92	$ 34.33	$ 35.07	$ 30.43	$ 37.56	$ 44.27
LTC *(appears in the delivery section of the bill)*	$ (2.11)	$ (2.21)	$ (4.08)	$ (5.76)	$ (1.27)	$ (3.39)	$ (2.40)	$ (3.18)	$ (2.19)	$ (1.49)	$ (0.91)	$ (0.62)	$ (1.16)	$ (1.37)
ESRM	$ 0.18	$ (2.47)	$ (26.25)	$ 39.64	$ (15.65)	$ 10.17	$ (19.04)	$ (6.10)	$ 2.68	$ 4.03	$ 2.93	$ 2.63	$ (1.92)	$ (3.65)
ESRM Deferral Collection	$ -	$ -	$ -	$ -	$ -	$ -	$ 7.20	$ 2.40	$ 2.40	$ 2.40	$ 2.40	$ 2.40	$ -	$ 0.73
MFC	$ 1.42	$ 1.59	$ 2.22	$ 1.74	$ 1.34	$ 1.47	$ 1.53	$ 1.70	$ 1.40	$ 1.33	$ 1.35	$ 1.22	$ 1.41	$ 1.52
GRT	$ 0.38	$ 0.42	$ 0.42	$ 0.89	$ 0.20	$ 0.51	$ 0.32	$ 0.46	$ 0.43	$ 0.42	$ 0.42	$ 0.37	$ 0.37	$ 0.43
Total Supply related charges	$ 36.00	$ 40.06	$ 38.39	$ 84.64	$ 19.30	$ 48.54	$ 29.59	$ 43.56	$ 41.65	$ 41.02	$ 41.25	$ 36.43	$ 36.26	$ 41.92
Total bill	$ 84.87	$ 88.37	$ 89.01	$ 129.53	$ 72.95	$ 100.39	$ 79.65	$ 92.25	$ 90.45	$ 89.07	$ 89.22	$ 84.41	$ 84.70	$ 90.38
% Delivery Inc/(Dec) on total bill	*4.8%*	*-0.7%*	*2.6%*	*-6.4%*	*6.8%*	*-2.5%*	*-1.8%*	*-1.7%*	*0.1%*	*-0.8%*	*-0.1%*	*0.0%*	*0.5%*	*0.0%*
% Supply Inc/(Dec) on total bill	*6.6%*	*4.8%*	*-1.9%*	*52.0%*	*-50.4%*	*40.1%*	*-18.9%*	*17.5%*	*-2.1%*	*-0.7%*	*0.3%*	*-5.4%*	*-0.2%*	*6.7%*
% Total Inc/(Dec)	*11.4%*	*4.1%*	*0.7%*	*45.5%*	*-43.7%*	*37.6%*	*-20.7%*	*15.8%*	*-2.0%*	*-1.5%*	*0.2%*	*-5.4%*	*0.3%*	*6.7%*

Table 3: National Grid, "Typical Load Zone Bill through January 2015"

System

The demonstration project makes the following assumptions in estimated benefits to customers and the electric distribution system grid:

- The average, annual output for all 100 solar PV units is 631,200 kWh (*526 kWh per month x 100 units x 12 months*).

[24] *See* New York State Homes and Community Renewal, *New York State Weatherization Assistance Program: Program Year 2014 State Plan*, April 10, 2014. nyshcr.org

[25] Cases 12-E-0201 and 12-G-0202 - *Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations of Niagara Mohawk Power Corporation for Electric and Gas Service*, "Testimony and Exhibits of: Shared Services and Customer Panel Exhibits_(SSCP-1) – (SSCP-2), at p.24.

- As the totalized generation of all 100 solar PV units will be delivered directly onto the grid, there is an inherent benefit to customers and the electric distribution system, especially at scale.
- The BNMC community is served in part by the Huntley Generating Station, one of the few remaining coal-fired plants in New York State. Developing a concentrated, scalable solar PV resource as outlined herein could contribute to fuel diversity while reducing carbon emissions.

Greater Electric Distribution System Efficiency

Through two-way, wireless communication and data collection between National Grid, the individual customer, and collective meters that utilize Volt/VAR Optimization and Conservation Voltage Regulation ("VVO/CVR") within the demonstration project area, this project seeks to reduce distribution losses and achieve voltage optimization at the individual load points of the demonstration project's 100 solar PV system sites and along their common feeder.

The residential solar PV system to be utilized by this demonstration project will include a micro-inverter having smart grid features accessible by National Grid. Feedback from individual power factor meters, as well as the master power factor meter deployed at the common substation, will allow communication by National Grid to control reactive power output from the solar micro-inverter.

Customer Segmentation and Demographics

Adjacent to the Campus, the City of Buffalo's Fruit Belt Neighborhood comprises approximately 130 acres and roughly 36 city blocks.

The Fruit Belt dates back to 1839 with the arrival of immigrants from Southern Germany who fled religious persecution. Upon arrival, they established a residential neighborhood and planted a variety of orchards that later will become the namesakes of the streets including Peach, Orange, Grape, and Lemon Streets. Employment was found in neighborhood breweries and small shops. A wide variety of churches have always been dispersed throughout the neighborhood while Public School #37 has been a center for the community since the 1880's.

Today, the Fruit Belt remains a tightly knit, residential neighborhood, with just under 2,000 people living in this well-defined area. It is a mixed-use community of single and multi-family homes, schools, and community centers. Approximately 41% of the homes in the Fruit Belt are owner-occupied, which is slightly lower than the rate of 44% in 2006 for the City of Buffalo overall.[26]

The average household income is approximately $23,000, which is less than half of the Buffalo area median income of $46,000. Approximately 13% of the adult population has an associate degree or higher. [27]

[26] Data Set: Census 2000 Summary File 1 (SF-1) 100-Percent Data, GCT-H6. Occupied Housing Characteristics. Data Set: 2006 American Community Survey; S2501. Occupancy Characteristics.
[27] Buffalo Niagara Medical Campus with Sasaki Associates and Madden Planning Group, March 2009, Fruit Belt Neighborhood Strategy, Figure 6 Educational Attainment, pg.6

Key neighborhood stakeholders are the BNMC and its member institutions, Fruit Belt community organizations and local educational institutions including the University at Buffalo, PS #195 City Honors, PS #37 Futures Academy and the Aloma D. Johnson Fruit Belt Community Charter School.

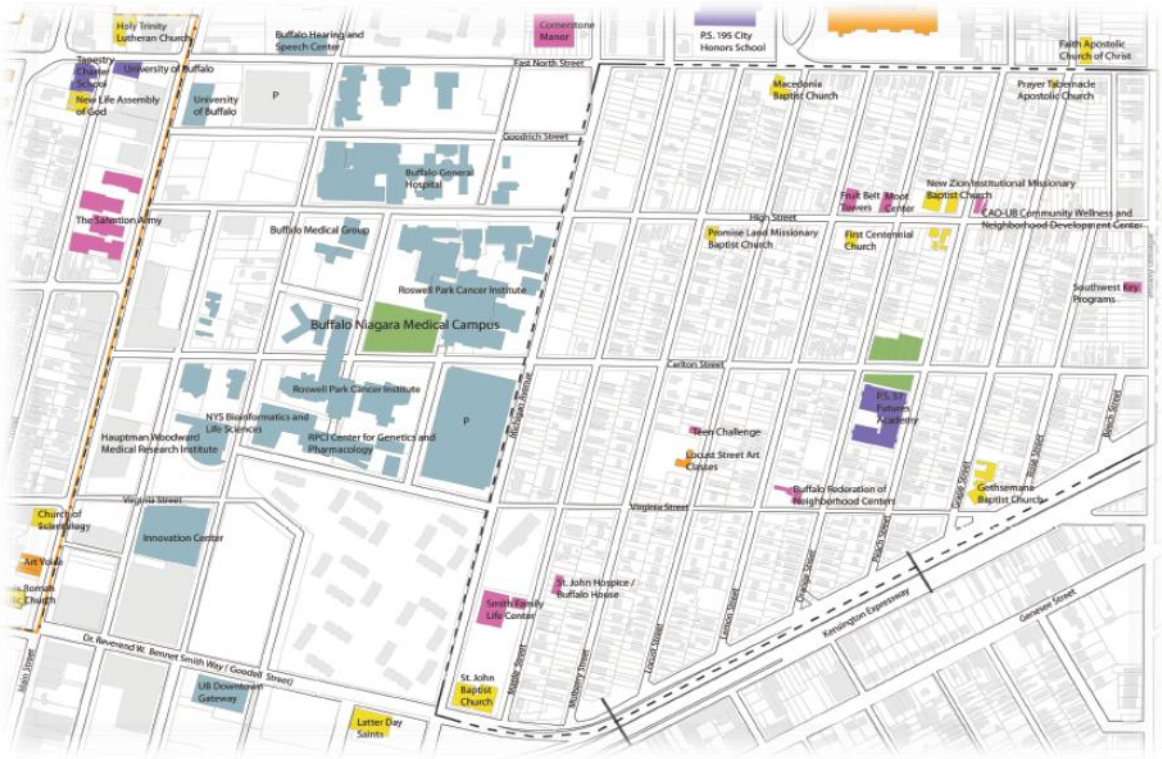


Figure 5: Demonstration Project Location and Context

Channels

The proposed demonstration project will pre-screen 100 structurally-sound rooftop, solar PV host sites within the Fruit Belt neighborhood boundary – or sites that will be considered suitable with the utilization of available project funding to address minor-to-moderate structural issues and/or electric service panel replacements that may present a barrier to customer participation in the demonstration project. In addition, the demonstration project will identify an additional 50 customers within the neighborhood who desire to participate in the project but whose homes, in their present condition, cannot structurally accommodate rooftop solar PV, even with minor-to-moderate repairs.

The demonstration project will also utilize the assistance of various established neighborhood community groups, as well as the BNMC's community outreach staff, in identifying potential neighborhood participants.

Scalability

Seeking to implement this demonstration project as a "first of its kind" versus a "one of a kind", the utility ownership model proposed here is scalable and replicable across LMI communities in National Grid's service territory. This model holds potential as a Non-Wires Alternative ("NWA") strategy in that it not only incorporates and concentrates DER in a defined area but seeks to increase the level of energy efficiency measures installed.

Demonstration Plan

Metrics for Success

The success of the demonstration project will be measured in several aspects:

- Monetary benefit to program participants in terms of tangible, bill credits for electric supply
- Energy efficiency benefits to program participants in terms of accessibility to:
    - Comprehensive home energy audits
    - Energy efficiency measures intended to not only address potential barriers to consumer participation in the demonstration project but to maximize the opportunity that such a project presents to address health, safety, and energy efficiency with an engaged customer group over an extended period of time, and
- Greater electric distribution system efficiency
    - Two-way, wireless communication and data collection between National Grid, the individual, collective metering[28], and solar micro-inverters, the demonstration project seeks to reduce electric distribution system energy losses and to achieve greater voltage optimization at the individual load points of the demonstrations project's 100 solar PV system sites and along their common feeder.
    - Once each solar PV system is installed and a baseline power factor is recorded, the wireless connection points will communicate in 2-second intervals with National Grid, as is the current EMS (Energy Management System) standard, to monitor and correct, as needed, the individual unity power factor of each solar PV site as well as the overall unity power factor of their common feeder (Figure 6).
- Mitigation of bad-debt
    - As a favorable impact on the uncollectible rate, the demonstration project's bill credits seek to assist participants to manage their electric bills and arrears. This is similar to National Grid's existing Low Income Discount Program that provides a $5.00 monthly credit for electric, non-heating customers who have received Home Energy Assistance Program (HEAP) assistance.[29]

[28] A VVO/CVR meter utilizes volt/VAR optimization (VVO) and conservation voltage reduction (CVR).
[29] *See* Case No: 14-M-0565 - *Proceeding on the Motion of the Commission to Examine Programs to Address Energy Affordability for Low Income Utility Customers*, Initial Comments of the Brooklyn Union Gas Company d/b/a National Grid NY, Keyspan Gas East d/b/a National Grid, and Niagara Mohawk Power Corporation d/b/a National Grid, March 4, 2015.

- In quantifying the benefits to both demonstration project participants and rate base, it should also be noted that the project intends to utilize the principles of the Department of Public Service's forthcoming Benefit-Cost Analysis Framework (BCA) [30] to measure:
    - Voltage Support
    - Greenhouse gas emission reductions
    - Energy efficiency adoption within the project area
    - Positive impact on uncollectibles and bad debt write-offs at the conclusion of the demonstration project.

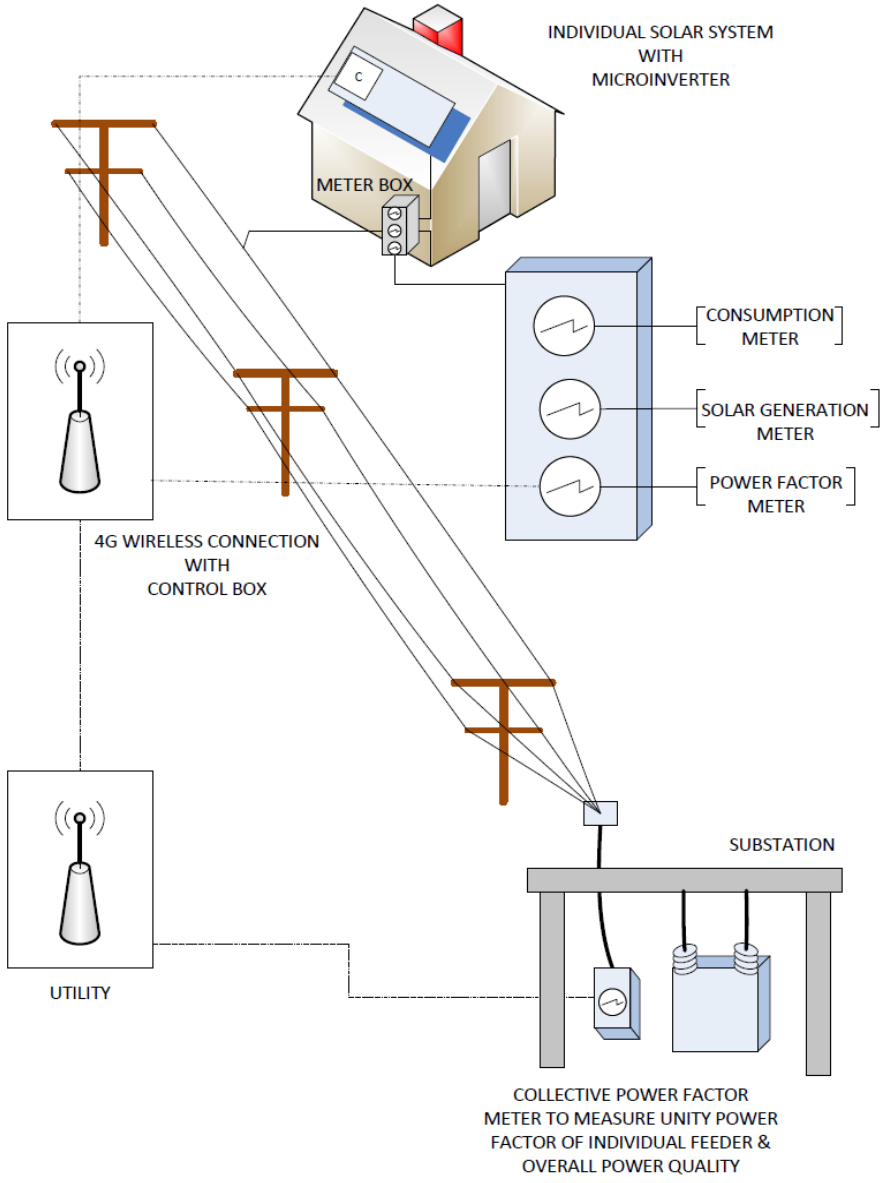


Figure 6: Illustration of Grid Efficiency Component of the Project

[30] REV Proceeding, Developing the REV Market in New York: DPS Staff Straw Proposal on Track One Issues, August 22, 2014, at p.44.

Timelines, Milestones, and Data Collection

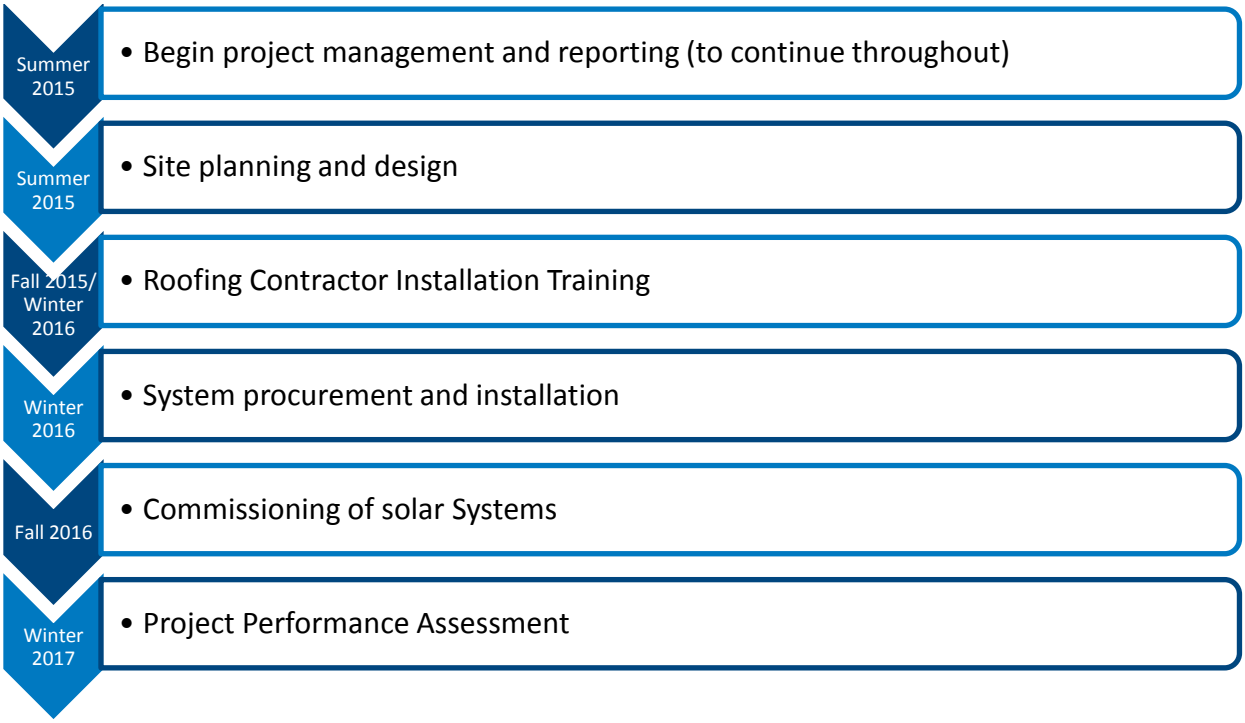


Figure 7: BNMC Fruit Belt Timeline

- *Customer Engagement* (already underway; letters of support from community organizations secured): 3-6 months
- *Incremental staged deployment*: 3-6 months
- *Immediate, initial data available for analysis* as solar PV systems come on-line – including trending data
- *Build portfolio of aggregated data for analysis*: 9-12 months

Participation

Target Population, Sample Size, Control Group

The demonstration project seeks to engage a subset of residential customers, or customers enrolled in National Grid's SC1 electric rate, within the Fruit Belt Neighborhood of the City of Buffalo.

In order to initially identify the pool of 300 residential customers within the Fruit Belt Neighborhood who desire to participate, the demonstration project will utilize neighborhood community groups and the BNMC's Community Relations staff.

The demonstration project will then pre-screen 100 structurally-sound rooftop, solar PV host sites – or sites that will be considered suitable with the utilization of available project funding to address minor-to-moderate structural issues and/or electric panel replacements that may present a barrier to customer participation in the project – within the Fruit Belt Neighborhood. In addition,

the project will identify an additional 50 customers within the neighborhood who desire to participate in the project but whose homes, in their present condition, cannot structurally accommodate rooftop solar PV, even with minor-to-moderate repairs.

Third-Party Partners

The following vendor and organizational partners have submitted official letters of support that are included in Appendix:

- General Electric (GE)
- University at Buffalo (UB)
- American Douglas Metals (a local, steel intrusion manufacturer),
- SPARQ Systems (a regional, solar micro-inverter start-up)

Note: Local contractors for the demonstration project's home structural assessments, comprehensive home energy audits, energy efficiency installations, and roofing repairs have yet to be identified.

Utility Resources and Capabilities

The demonstration project will leverage the knowledge and expertise of the following National Grid departments:

- Asset Management
- Billing Operations
- Consumer Advocacy Low Income Program New York
- Customer Organization
- Electric Operations – New York
- Network Asset Strategy
- Network Strategy
- New York Pricing
- Western Region Control Center operations
- Western New York Jurisdiction Team

Community Outreach / Community Engagement

Outreach to Affected Communities

The smarthomebuffalo® Project, located within the Campus, is intended to serve as a visual, customer engagement tool for the demonstration project. A first of its kind, smarthomebuffalo® is a renovation – and deep energy retrofit – of a turn of the century home in the city of Buffalo. Symbolic of the thousands of such structures across Western New York, the building represents a living example of how the character and heritage of such homes can be maintained and celebrated – while making home energy improvements what the future of energy looks like. Most importantly, visitors will be able to take home practical and tangible solutions that they can implement in their own home to save on energy costs to promote energy efficiency.

To supplement the customer engagement role of smarthomebuffalo®, additional centrally

located, visual displays of the demonstration project's solar PV output will also be deployed at community centers, schools, and emergency shelters located in the project area.

Motivating Customers / Communities

Please see the "Unique Value Proposition – Participating Customer" section above.

Conditions / Barriers

Market rules and standards

The demonstration project seeks to explore utility ownership of DER to address an existing market failure for LMI) customers.

The Commission's February 26, 2015 Order Adopting Regulatory Framework and Implementation Plan ("REV Track One Policy Order")[31] stated that utility ownership of DER will only be allowed under certain discrete circumstances, which includes "a project that will enable low or moderate income residential customers to benefit from DER where markets are not likely to satisfy the need or where a project is being sponsored for demonstration purposes." [32] This demonstration project satisfies the narrow circumstances under which utility ownership of DER is allowed.

Consumer Protections

The proposed demonstration does not have any Consumer Protections implications.

Channel or Market Challenges

Please see the "Channels" section that describes how existing Market Challenges will be addressed.

Financial Elements / Revenue Model

The demonstration seeks to test if new revenue streams can be created through utilization of its model.

Platform Services, including Pricing Strategies

The total monetary credit for the aggregated generation of all 100 rooftop solar PV units will be shared equally by the 150 active, residential electric account holders participating in the project and will appear as a supply credit on their respective monthly bills. A high-level estimate for the billing enhancement required by this demonstration project has previously been obtained from National Grid's Billing and System Department *(see Appendix).*

[31] Case 14-M-0101 – *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV Proceeding"), Order Adopting Regulatory Policy Framework and Implementation Plan ("REV Track One Policy Order") (issued February 26, 2015).
[32] *Id.*, at p.70.

Investments

The program budget for this demonstration project makes the following budgetary assumptions:

- Within the community boundary, 100 residential rooftops suitable to host solar PV arrays be identified and secured for the project.
- A subset of the 100 residential rooftops suitable for solar PV may require repairs. A portion of the project budget has been allocated to address this potential barrier to customer participation.
- The expected asset life of all equipment for the program (PV module, micro-inverter, and mounting system) is 25 years.
- All rooftop units will be installed by certified roofers.
- All installations will qualify for the Federal 30% investment Tax Credit ("ITC"), as the Emergency Economic Stabilization Act of 2008 (EESA) extended the 30% ITC to investor-owned utilities. Prior to EESA, public utilities were not eligible for ITC benefits.[33]
- All installations will qualify for NYSERDA's $0.90/watt certified installation rebate, assuming there is no sunset date prior to the commencement of the program.[34]
- National Grid's Billing & Systems Department will perform the necessary Customer Service System ("CSS") rider or special contract to isolate and manually credit the totalized generation revenue to electric customers within the demonstration project's boundary.
- Given the innovative nature of this solar PV model, there are R&D benefits to be gained by modeling the electric distribution system post-installation.

Using the GE/NYSERDA 5 kW micro-inverter system (Figure) that is currently being demonstrated at National Grid's Henry Clay Boulevard facility in Syracuse, New York to inform the estimated total cost of this program, Tables Table 5, Table 6, and Table 7 below list the equipment and installation costs, total tax incentives, and total out-of-pocket costs per solar PV unit as well as for all 100 solar PV units specified for the demonstration project. It should be noted that given the "plug and play" nature of this proposal, an alternative, solar PV unit could be utilized in place of the GE/NYSERDA 5kW micro-inverter system.

Lastly, Table 6 provides the estimated Total Projected Project Cost and estimated Total Out-of-Pocket Project Cost with incentives included. In theory, if the demonsration project could reasonably quanitfy all benefits to customers and the overall electric grid, making this project pay for itself within one year, see calculations in Table 7. One-time development costs are indicated with a "*".

[33] Michael Mendelsohn and Claire Kreycik, National Renewable Engineering Laboratory, "Federal and State Structures to Support Financing Utility-Scale Solar Projects and the Business Models Designed to Utilize Them." http://www.nrel. gov/docs/fy12osti/48685.pdf, pg.2.
[34] NY Sun Initiative Dashboard. https://www.powerclerk.com/nysuninitiative/dashboard.aspx

System Advisor Model Report

Photovoltaic System	4.88 kW Nameplate	BUFFALO, NY
Residential	$3.59/W Installed Cost	42.93 N, -78.73 E GMT -5

Performance Model

Modules	
Canadian Solar CS6X-305M	
Cell material	c-Si
Module area	1.9 m^2
Module capacity	304.9 DC Watts
Quantity	16
Total capacity	4.9 DC kW
Total area	29 m^2

Inverters	
Power-One: MICRO-0.3HV-I-OUTD-US-240 240V	
Unit capacity	300 AC Watts
Input voltage	30 - 75 VDC DC V
Quantity	17
Total capacity	5.1 AC MW
DC to AC Capacity Ratio	0.00
AC derate factor	0.99

Array	
Strings	16
Modules per string	1
String voltage (DC V)	36.6
Tilt (deg from horizontal)	22
Azimuth (deg E of N)	180
Tracking	fixed
Backtracking	-
Rotation limit (deg)	-
Shading	yes
Soiling	yes
DC derate factor	0.98

Performance Adjustment	
Annual	none
Year-to-year decline	0.5%/yr
Hourly factors	no

Annual Results (in Year 1)	
Horizontal solar kW/m^2	1,341
Incident solar kW/m^2	0
DC kWh from array	5940.000
Net to inverter	5,820 DC kWh
Gross from inverter	5,530 AC kWh
Net to grid	5,470 AC kWh
Capacity factor	12.8%
Performance factor	0.89

Figure 8: Expected Energy Generation for the GE/NYSERDA 5 kW Micro-inverter System Nameplate

Pre-Installation Costs (per unit, total for #100 units)		
Structure & Design Engineering	$2,000.00	$200,000.00
Overhead (insurance, NYS filing fees, incorporation, etc.)	$700.00	$70,000.00
Permitting	$250.00	$25,000.00
Equipment-related Costs (per unit, total for #100 units)		
Per unit cost (including PV Module, micro-inverter, and mounting system)	$14,000.00	$1,400,000.00
Transportation	$750.00	$75,000.00
2nd meter & channel to separately measure solar generation (single phase meter)	$100.00	$10,000
Installation expense (includes meter set for 2nd meter)	$7,425.00	$742,500.00
TOTAL	***$25,225.00***	***$2,522,500.00***

Table 4: Estimated Equipment and Installation Costs

Tax Incentives (per unit, total for #100 units)		
NYSERDA Rebate @ $0.90/W	$6,313.50	$631,350.00
30% Federal ITC	$7,155.84	$715,584.00
TOTAL	***$13,469.34***	***$1,346,934.00***

Table 5: Tax Incentives

Total Out-of-Pocket Cost (per unit, total for #100 units)		
Total Equipment & Installation Cost	$25,225.00	$2,522,500.00
Total Tax Incentives	$13,469.34	$1,346,934.00
TOTAL	***$11,755.66***	***$1,175,566.00***

Table 6: Estimated Total Out-of-Pocket Costs

Total Upfront and Out-of-Pocket Program Costs	
Total Equipment & Installation Cost	***$2,522,500.00***
Comprehensive Home Energy Audit Screenings and Home Energy Health & Safety Measures *(for 300 customer participant pool)*	$300,000.00
Initial Minor Roofing Repairs and Electric Panel Replacements *(for #100 host sites)*	$200,000.00
Roofing Repairs for 25-yr. Life of Assets	$50,000.00
Community Education	$250,000.00
Development of Micro-inverter Wi-Fi Communication System to Optimize Dispatch Signals & Efficiency of Feeder	$225,000.00*
Modeling of the Distribution System Post-Installation	$100,000.00*
Billing/Credit Rider Enhancement	$81,000.00*
O&M *($15,000.00/year for 2 years of the Project)*	$30,000.00
TOTAL UPFRONT PROJECT COSTS	***$3,758,500.00***
TOTAL TAX INCENTIVES	***$1,346,934.00***
TOTAL OUT-OF-POCKET PROJECT COSTS	***$2,431,566.00***

Table 7: Estimated Total Upfront and Out-of-Pocket Program Costs

Returns & Cost Effectiveness

The demonstration project seeks reasonable returns in terms of positive customer arrears impacts and greater electric grid efficiency.

Reporting

Information to be Included in Quarterly Reports to the Commission

Quarterly progress reports on the stakeholder and business model work will be provided to the Department of Public Service ("DPS") Staff. These reports will include at a minimum an overview of project progress against timeline/plan and results as they become available. Additionally, in order to maintain flexibility and maximize the potential for innovation and learning the reports may contain other updates or deviations from the initial details provided in this filing. To further ensure alignment, the Company would also like to meet with DPS Staff to discuss the quarterly progress reports. Any changes related to costs shall remain within the overall revenue requirement cap. Furthermore, as highlighted in the DPS letter dated June 24, 2015,[35] should a situation or activity arise that is not authorized by the Commission the Company would include a description in the quarterly report and request such authorization through a petition to the Commission. Lastly, the Company looks forward to continued collaboration with DPS beyond the formal quarterly reports.

[35] Letter from Tammy Mitchell and Marco Padula, New York State Department of Public Service Staff, to Utility REV Demonstration Project Representatives (June 24, 2015).

Conclusion

Seeking to implement this demonstration project as a "first of its kind" versus a "one of a kind", the ownership model proposed here is scalable and replicable across LMI communities in National Grid's service territory. Once more, this model holds potential for increasing the level of energy efficiency measures installed among LMI customers and also as a method for increasing overall electric distribution system efficiency.

Post-Demonstration Qualitative and Quantitative Benefits

This demonstration project anticipates that participants will continue to benefit from lower supply costs over the solar PV system's estimated 25-year asset life as well as from the energy efficiency measures installed and behaviors garnered from the project. Similarly, National Grid and its customer base are expected to continue to benefit from the greater electric distribution system efficiency – and subsequent deferred infrastructure improvements.

Plans to scale

The demonstration project has the potential for being deployed to other LMI areas and communities as both a customer engagement strategy and as a proactive strategy to mitigate the effects of written-off debt on National Grid's customer base. As indicated in the figure below from Grid Alternatives Spring 2014 report[36], there are opportunities across New York State to increase solar PV penetration in LMI communities.

[36] Christophe Jospé, Curtis Probst, Mara Elana Burstein, Tiancheng Deng, Erica Helson, Chanelle Mayer, Kim Palacios, Igor Valdebenito, Kirstin Verriest, and Bora Youn, "Ensuring New York Solar Program Reach Low-Income Residents," Grid Alternatives, Spring 2014, at p.29. http://mpaenvironment.ei.columbia.edu/files/2014/06/GRIDAlternativesProject.Final.pdf

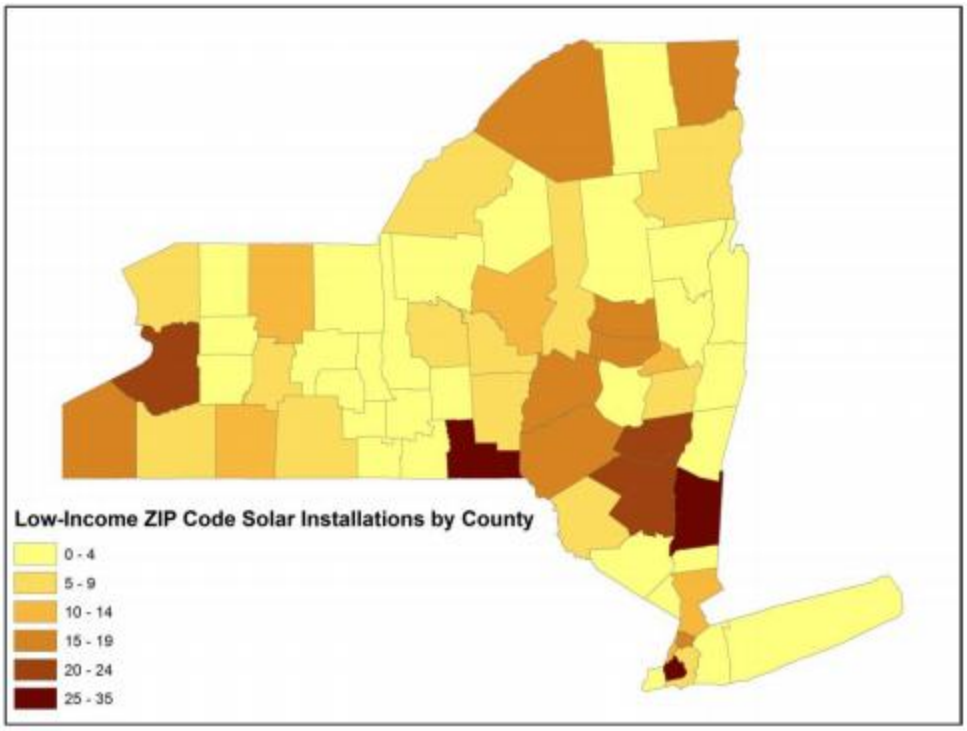


Figure 9: Solar Installations in Low Income NYS Zip Codes

Scaling will require an assessment of the results from the demonstration project and the overall benefit received from customers participating, and all throughout the National Grid footprint.

Break points in scaling

(Intentionally omitted)

Advantage

While similar community solar projects have also been proposed by utilities such as Central Hudson Gas & Electric, Arizona Public Service, and Oklahoma Power and Light; and are being explored by the Massachusetts Department of Public Utilities ("DPU") and the Rhode Island Public Utilities Commission ("PUC"), the proposed demonstration project herein differs in its fundamental motivation to increase customer engagement among low-income electric customers by not only clearing traditional financing obstacles and physically bringing solar PV assets to the neighborhood but also by allocating the full monetized benefit of the generation to a larger subset of the neighborhood to ultimately lower bills.

A majority of the Fruit Belt is served by a single substation that shares the Campus' common, (4) 23 KV feeders. This substation serves approximately 4,000 residential customers and 500 commercial customers. These customers could potentially disconnect from the grid during weather or system-related events and be served by on-site, Campus generation resources, as is being explored through the BNMC's successful NY Prize Feasibility Study award.

The Fruit Belt Community Solar Demonstration Project could potentially act as a collective DER

asset that could be optimized by the second REV demonstration project that is being proposed by National Grid at the BNMC, a Distributed System Platform (DSP) Market Engagement Model Demonstration project.

Distributed System Platform (DSP) Market Engagement Model Demonstration Project Proposal

Buffalo Niagara Medical Campus (BNMC)

Niagara Mohawk Power Corporation d/b/a National Grid

July 1, 2015

Executive Summary

This Reforming the Energy Vision ("REV") demonstration project described herein is submitted by Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") with the Buffalo Niagara Medical Campus ("BNMC" or the "Campus") as its customer partner.

Consisting of 13 member institutions and close to 100 public and private companies, the BNMC is a dynamic mix of health care, life sciences, medical education, and private enterprise that is a significant growth engine of Western New York. At 7 million square feet of infrastructure today with 2 million square feet of new construction currently underway, the Campus has its sights set on accommodating an additional 5.3 million square feet by 2030 to achieve its long-term vision of a comprehensive Community Engaged Academic Health Center in Downtown Buffalo.

To advance these goals, the Campus collectively approached National Grid in 2011 seeking its expertise in meeting their anticipated energy needs and transportation challenges. As a result, the *energizeBNMC* Partnership was formed and a *5-Year Energy Innovation Plan* (the "*Plan*"), to complement the Campus's *2010 Master Plan*, was drafted to integrate energy efficiency, grid modernization, alternative transportation, and renewable energy to foster a sustainable, growing community that generates jobs and fosters local economic growth. In particular, the *Plan* concentrates on ultimately developing the Campus and surrounding neighborhoods as a self-sustainable energy hub, or portfolio, able to island from the electric grid and serve local load in the event of a utility system outage or natural disaster. Consequently, BNMC member institutions and adjoining community members will be empowered to optimize their respective energy priorities with respect to reliability, cost, and sustainability while actively coordinating their collective distributed energy resources ("DERs") in a market that compensates them for providing benefits to the electric grid, as the REV proceeding outlines.

The BNMC is well-positioned and arguably closer to effectively contributing to market animation than many other areas of the State. There is a current level of diversity and potential for greater diversity, in terms of load type, fuel source, control capability, and automation amongst other elements within the BNMC alone to demonstrate the vision REV is driving towards. With the proper amount of support, access to resources, and stakeholder focus, the BNMC stands to deliver the replicable, functioning community microgrid with grid-interactive 'blue sky' optimization capabilities envisioned by REV in very short order. Concepts proven at the BNMC can then easily be expanded to the City of Buffalo's *Energy Master Plan* and other regional initiatives.

In order to move forward with the implementation of that vision, this proposal outlines a comprehensive demonstration project that can be deployed incrementally to test how customers with DER assets, demand response, and automated demand management capabilities, such as the Campus, can be motivated to provide these services to the benefit of the distributed system platform ("DSP") and the overall electric system through price signals and market opportunities that result in a motivating return on investment ("ROI") for the customer.

This demonstration, as it is currently scoped, encompasses two (2) elements:

Element 1: Development of a valuation model to enable the DSP to meet short-cycle load relief and alleviate forecasted electric system challenges to not only achieve a level of resiliency during weather and other system events that compromise the integrity of the electric distribution grid and its ability to deliver energy, but to also defer utility infrastructure investment.

Element 2: Testing of a model nodal interface through the creation of a Network Operations Center ("NOC") at the Campus. The NOC will serve to optimize and aggregate Campus-based assets by connecting energy supply and demand while providing visibility into each customer-level DER in addition to serving as a model for a single nodal interface with the DSP.

This demonstration project is designed to test the following two hypotheses:

1. What are the functional, operational, and monetary benefits to the electric distribution system and the DSP that flow from the nodal model, or customer aggregation, based on the capabilities of, and access to, customer-to-grid DER?
2. What types of opportunities motivate customer investment in DER assets and participation in animated markets?

Business Model Overview

The Market Opportunity

While the DSP market structure, the products it transacts, and its transactional mechanisms will evolve over time, their successful translation into an animated market will provide clear short- and long-term signals to customers that reflect the benefit and cost of their market activity. In turn, paths to monetization will spur customer investment. As such, initial market development has a priority need for standardized DSP planning, market and operational functions, and interfaces to attract DSP market actors.

In the aggregate, the member institutions of the BNMC have an average peak load of 31. 7 MW and a total installed generation capacity of approximately 26 MW. The diverse load profile, urban location, and demographics of the Campus, coupled with the advantage of a concentrated, controlled test environment, offers the opportunity to effectively integrate and optimize the BNMC's existing and future envisioned DER inventory as a collective node to inform the function and operation of National Grid's DSP.

Near-term products transacted and purchased by the DSP should be focused on electric distribution grid services that enable it to optimize the operation of the electric distribution system. Energy supply, Capacity deferrals, voltage management, peak load modifications, ancillary services, and dynamic load management are product examples that the demonstration project seeks to evaluate in its test of what drives new market opportunities.

Proposed Solution

The near-term focus of this demonstration project is to lay a foundation that will enable early success. It is a staged approach that establishes a line of sight while allowing the market to evolve.

The BNMC represents an aggregation of large commercial and industrial customers who aspire to optimize revenue-generating and saving opportunities for their evolving inventory of DERs. The willingness of its member institutions, both individually and collectively, to engage in demand response and dynamic load management, is based on their own priorities with respect to reliability, cost, and sustainability. This demonstration project seeks to test and develop a DSP nodal model and the desired objectives of the DSP as noted in the Commission's February 26, 2015 Order Adopting Regulatory Policy Framework and Implementation Plan ("REV Track One Policy Order")[37] within the motivated market of the BNMC to determine what price signals and/or revenue opportunities motivate its member institutions to provide the DSP with electric distribution system services at the nodal level.

In order to conduct this test and leverage the sophisticated infrastructure capabilities of the BNMC, this demonstration project, as it is currently scoped, encompasses two (2) major elements:

Element 1: Development of a valuation model to enable the DSP to meet short-cycle load relief to alleviate forecasted electric system challenges to not only achieve a level of resiliency during weather and other system events that compromise the integrity of the electric distribution grid and its ability to deliver energy, but to also defer utility infrastructure investment.

This element of the demonstration project is in the spirit of the REV proceeding's declaration that "[w]here markets are created by order of the Commission, and managed by a DSP that is regulated by the Commission, the Commission has responsibility to ensure that customers and service providers can participate in those markets with confidence."[38] As one of the guidelines for market design is the fair valuation of benefits and costs, Element 1 seeks to begin the process of informing what valuation model will lend itself to investment confidence for customers.

Element 2: Testing of a model nodal interface through the creation of a Network Operations Center ("NOC") at the Campus. The NOC will serve to optimize and aggregate Campus-based assets by connecting energy supply and demand while providing visibility into each customer-level DER in addition to serving as a model, single nodal interface with the DSP.

Further, the NOC at the BNMC will utilize a combination of:

- A *market interface* that utilizes the Campus' diverse and flexible assets to monetize its DER inventory through new distribution-level opportunities offered through the DSP and in an enhanced manner at the wholesale level via the New York Independent System Operator ("NYISO") and through its commodity purchases;

[37] Case 14-M-0101 - *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Order Adopting Regulatory Policy Framework and Implementation Plan ("REV Track One Policy Order") (issued February 26, 2015), at pp. 31-35.
[38] *Id.*, at p.102.

- *Command and Control Functionality* that serves to interface Campus-level command and control capabilities with the DSP's local electric distribution grid infrastructure to enable the BNMC's collective portfolio to serve as an asset to the benefit of the electric distribution system;
- An *Optimization Platform* that maximizes economic value (*i.e.*, savings, avoided costs, etc.) through the efficient use of the Campus's existing and future portfolio of DERs, including co-generation, renewables, storage, alternative fuels, alternative generation, energy efficiency, demand response, and demand management capabilities;
- A *Generation Switch* that not only responds to market prices but also to market opportunities to enhance the electric distribution system and to generate savings for the BNMC member institutions;
- *Smart metering* to enable two-way communication between meters and the DSP; and
- A *data display* to enable analysis and real-time visualization for the purposes of both the demonstration project and to inform the Campus' member institutions, stakeholders, and the DSP.

With the NOC in place at the BNMC, National Grid will have the ability to test how customers' DER, such as those existing and anticipated at the BNMC, can be informed by forecasted loads, generation availability, and electric distribution system constraints to create dynamic, forward-looking dispatch schedules that will allow the DSP to accomplish short-cycle load relief. Whether to the benefit of the DSP in terms of alleviating real or anticipated electric distribution system issues or to the benefit of customers in terms of revenue and/or saving opportunities that align with their reliability, cost, and sustainability priorities, Element 2 of the demonstration project will leverage the BNMC's NOC to inform how the DSP can best deliver on REV objectives for all customers in terms of transparent system planning, electric distribution system efficiency, and market operations.

Once operational, the NOC will establish a single, model nodal interface with the DSP that will, in turn, initiate the Stage 2 market opportunities described in the following section.

Hypotheses Tested

The proposed demonstration project seeks to determine within the DSP framework proposed by the REV proceeding, given the priorities and value drivers of the BNMC's member institutions, the following:

1. What are the functional, operational, and monetary benefits to the electric distribution system and the DSP that flow from the nodal model, or customer aggregation, based on the capabilities of, and access to, customer-to-grid DER?

   This DSP valuation model will, in turn, inform customer monetization.

2. What types of opportunities motivate customer investment in DER assets and participation in animated markets?
   - Is it a tariff (rate) and/or opportunity to generate revenue?
   - What is the monetization delta for the customer?

- What forms of demand response (or continual demand management) motivate customer investment and participation in electric grid optimization?

REV Demonstration Project Principles Addressed

The Company anticipates that this demonstration project will meet all of the following REV demonstration project criteria:

3rd party partners	New Utility Business model	Customer-Community Engagement	Identify Economic Value	Pricing and Rate Design	Transactive Grid	Scalability	Market Rules and Standards	Cost Effective	Timeframe
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

This demonstration project further supports the stated goals and objectives of the Commission's REV Criteria including;

- Market animation and leveraging of customer contributions
- Establishment of simple DSP capabilities and local market capabilities with early forms of nodal pricing
- System-wide electric efficiency
- Fuel and resource diversity
- System reliability and resiliency

Market Attractiveness

Unique Value Proposition

This demonstration project provides New York State and National Grid a controlled, "real life" DSP test bed. As stated within the REV Track One Policy Order, "The structure of the market will be *a function of the needs defined by the DSP and customers*, the products available in the market and procurement mechanisms for those products, the identity and capabilities of market participants and *their interactions among each other and with the DSP*…"[39] [emphasis added]. In creating this environment, this demonstration project will enable National Grid and the BNMC to model the operation and functionality of a DSP node, while leveraging funding previously awarded to the BNMC through the New York State Energy Research and Development Agency's ("NYSERDA") Smart Grid Program Opportunity Notice ("PON") 2715 and the New York Prize Community Microgrid Competition, for which the BNMC was awarded funding to study feasibility.

[39] *Id.*, at p. 33.

The diagram in Figure 10 illustrates the overall and individual value flows for the BNMC NOC (the "participating customer"), partners, third parties and the DSP (which represents the interests of both the utility and the electric system).

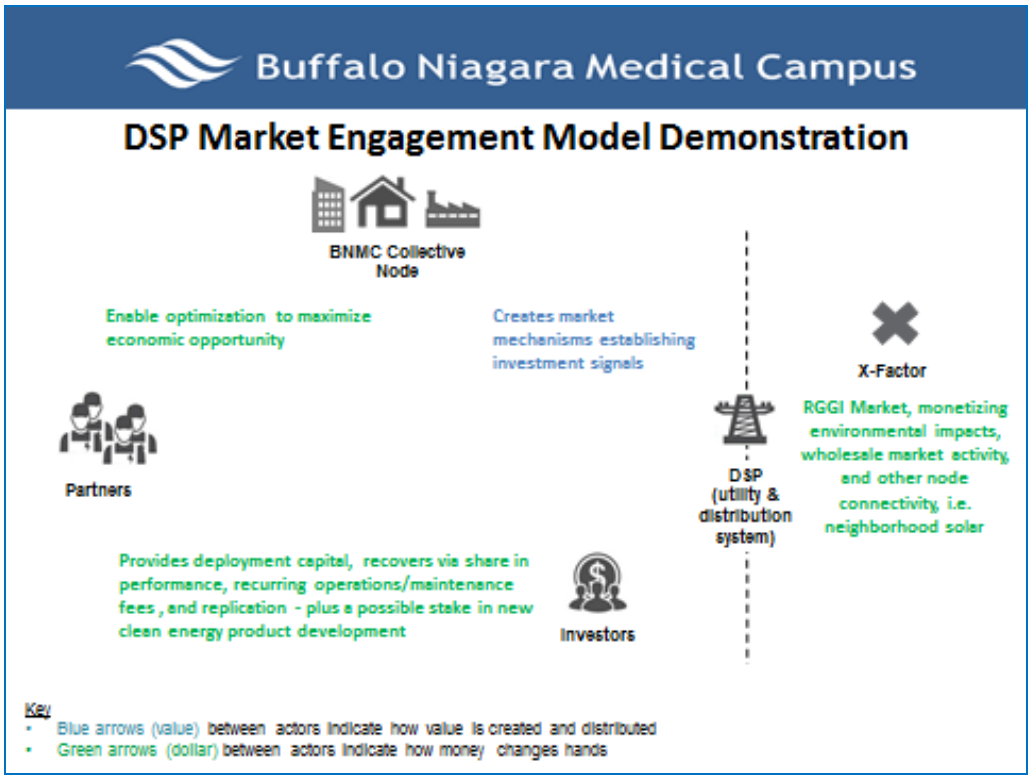


Figure 10: DSP Value Flows

Customer Segmentation and Demographics

The demonstration project seeks to engage the member institutions of the BNMC. The BNMC Board Members are:

- Buffalo Hearing & Speech Center
- Buffalo Medical Group, P. C.
- Hauptman-Woodward Medical Research Institute
- Kaleida Health
- Olmsted Center for Sight
- Roswell Park Cancer Institute
- University at Buffalo, State University of New York

Other BNMC Members include:

- Center for Hospice and Palliative Care
- Ross Eye Institute
- Unyts

The BNMC's three major entities – Roswell Park Cancer Institute, University at Buffalo, and Kaleida Health, in particular, own and operate the majority of buildings on the Campus:

Entity:	***Facilities:***
University of Buffalo	UB Center of Excellence in Bioinformatics & Life Sciences, Research Institute on Addictions, UB Gateway Building and UB School of Medicine *(currently under construction)*
Roswell Park Cancer Institute	901 Washington Building, Cancer Cell Center, Carlton House, Gratwick Basic Science Building, Cell and Virus Building, Center for Genetics and Pharmacology, Medical Research Complex, Main Hospital, Research Studies Center, and Grace Cancer Drug Center
Kaleida Health	Community Mental Health Center & Public Safety HQ, UB RIA, Global Heart & Vascular Health Institute / UB CTRC, Boiler House, Skilled Nursing Facility, Ambulatory Surgery Center/ Medical Office Building, Buffalo General Hospital, and Kaleida Health's Women and Children's Hospital *(currently under construction)*

Table 8: BNMC Three Major Entities

Channels

Given that this demonstration project is an extension of National Grid's extensive collaboration with the Campus member institutions in the development of the BNMC's *5-Year Energy Innovation Plan* in 2011/2012 as well as its current engagement with the Campus in the implementation of the *Plan*'s energy initiatives through its Campus-wide Energy Steering Committee, no additional communication, sales and/or promotion channel needs have been identified.

Scalability

There is also the potential for the BNMC NOC to serve as a common optimization platform for other regional nodes whose operator(s) lack the financial resources and/or motivation to invest in their own NOC to interface with the DSP. Providing other nodal customers this option will not only create another avenue for their market participation, but will ultimately lead to the creation of *regional* dispatch capabilities that could result in efficient and cost-effective demand elasticity. In essence, by acting as the DSP's single point of contact for multiple nodes of DER assets, customers will benefit from the monetization of additional electric distribution system efficiencies. This will allow the DSP to improve the overall efficiency of the electric distribution system.

Demonstration Plan

Metrics for Success

The success of this demonstration project will be measured by its ability to support and inform the three functions of the DSP as described within the REV Track One Policy Order:

1. *Transparent Integrated System Planning for Current and Future Needs*
    - Inform National Grid's DSP
    - Engage the BNMC NOC to help address projected electric distribution system issues
2. *Electric Distribution System Benefits*
    - Leveraging of the BNMC's NOC , or model nodal interface, to enable the DSP to accomplish short-cycle load relief to alleviate forecasted electric system issues,
    - Realize resiliency during weather and system events that threaten the integrity of the electric distribution system
    - Extend the asset life of existing infrastructure, and
    - Defer future infrastructure spending
3. *Market Operations*
    - Electric distribution system efficiency
    - Rate of DER penetration
    - Establishment of a Measurement and Verification ("M&V") methodology to ultimately inform electric system efficiency

Timelines, Milestones, and Data Collection

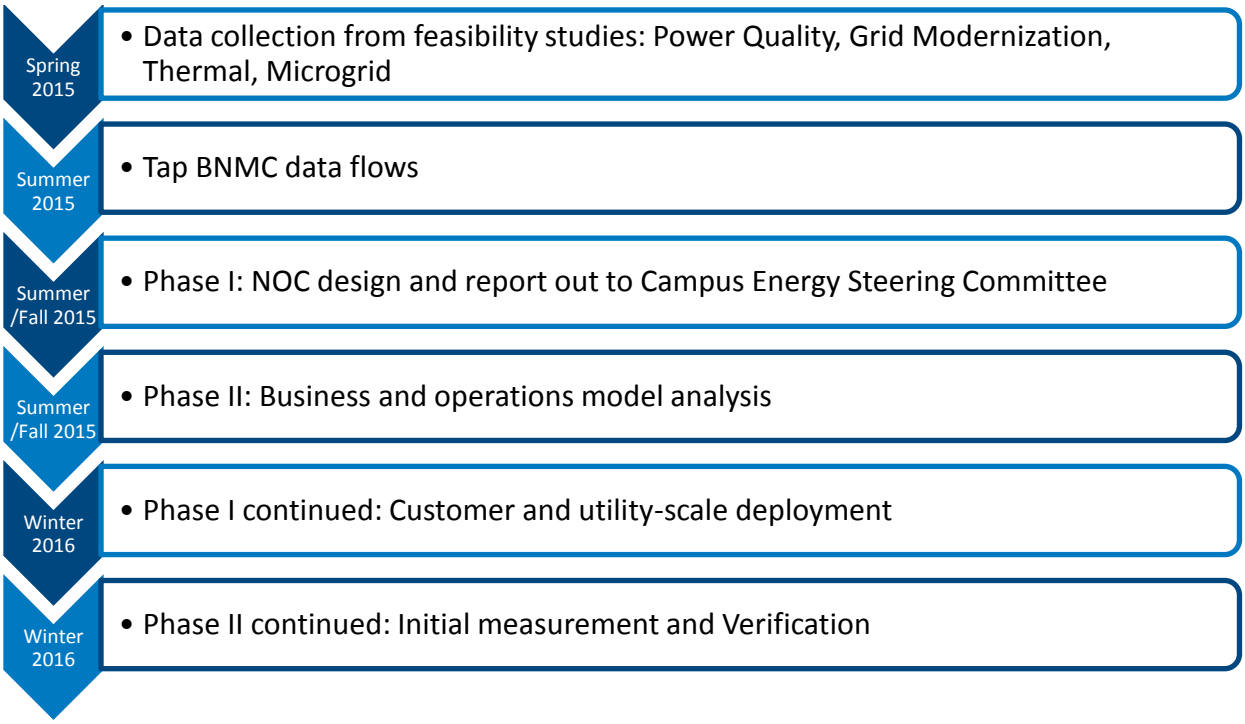


Figure 11: BNMC DSP Timeline

Participation

Target Population, Sample Size, Control Group

(Intentionally omitted)

Third-Party Partners

To best leverage the funding previously awarded to the BNMC by NYSERDA's Smart Grid PON 2715 and the NY Prize Community Microgrid Competition towards this demonstration project, the BNMC and National Grid are currently in the process of engaging and vetting potential vendor and organizational partners.

The list in Figure 12 represents the identified partner verticals for these initiatives which are anticipated to carry over to Element 2 of this demonstration project.

Figure 12: BNMC DSP Partners

Utility Resources and Capabilities

The proposed demonstration project will leverage the knowledge and expertise of the following National Grid departments:

- Asset Management
- Consumer Advocacy Low-Income Program Upstate New York
- Customer Organization
- Electric Operations – New York
- Network Asset Strategy
- Network Strategy
- New York Pricing
- Western Region Control Center Operations
- Western New York Jurisdiction Team, and
- Wholesale Electric Supply

Customer Outreach / Community Engagement

Outreach to Affected Communities

(Intentionally omitted)

Motivating Customers / Communities

(Intentionally omitted)

Conditions / Barriers

Market Rules and Standards

The success of this demonstration project rests on the creation and use of market signals to dynamically manage the BNMC's DER capabilities to improve electric distribution system efficiency and resiliency as well as provide revenue-generating (and saving) opportunities predominantly during "blue sky" days.

Customer Protections

(Intentionally omitted)

Channel or Market Challenges

In terms of market challenges, it should be noted that the market price signals utilized by this demonstration project may prove too low to garner the customer's interest or, likewise, the customer's price point for participation may be too high.

Financial Elements / Revenue Model

New Utility Revenue Streams

A primary function of the DSP will be to gain a greater awareness of the locational and temporal cost of capital improvements to the electric distribution grid in both the short- and long-term. The identification of these short- and long-range marginal electric distribution costs will be the basis for incentives that the DSP can provide to providers and customers that can offer DER resources that allow the utility to avoid or defer these costs. The intent during the initial stage of DSP market implementation is not to provide variable electric distribution rates based on location and time to end-use customers, but instead, to incent cost-effective DER utilization through its proper valuation.

Element 2, the follow-on initiative to the foundational work above, will seek to drive the creation of additional new revenue streams and value flows through leveraging aggregated customer DER to accomplish such electric distribution system services as:

- *Electric Distribution Capacity Relief* that utilizes the ability of customers' DER, at the

electric distribution level, to favorably reduce system loading

- *Electric Distribution Ancillary Services* including short notice (sub 5-minute or faster response) and short duration (15-30 minutes) for more frequent electric distribution system events. In certain circumstances, properly equipped customers could provide frequency regulation service in the form of added or reduced load within <5 seconds
- *Dispatch Capability* that will allow a customer's collective portfolio to appear to the market operator (DSP or NYISO) as a single dispatchable load able to provide load reduction or management services
- *Environmental Attributes* that will generate Renewable Portfolio Standard ("RPS") credits that, in turn, will be monetized.

All of these electric distribution system services could be bid-based or via a bi-lateral arrangement with the market operator (DSP or NYISO).

Platform Services, Including Pricing Strategies

(Intentionally omitted)

Investments

Details and Timing of Spending

This demonstration project will require an initial investment in equipment and software, as well as operational and maintenance resources, for National Grid and the BNMC to jointly build the NOC sought in Element 1 to accomplish the objectives of Element 2.

It should be noted that at the conclusion of the demonstration project the BNMC's NOC going forward will be managed either through:

1. National Grid's ownership and operations of the NOC;
2. National Grid's ownership of the NOC and BNMC's operations of the NOC where the NOC will be leased by the BNMC in order to avoid the NOC becoming a stranded asset for National Grid;
3. The BNMC's outright purchase of the NOC from National Grid with operations of the NOC wholly maintained by the BNMC ; or
4. The dissolution of the NOC, if proven economically infeasible.[40]

The total Ask for this demonstration project is $5 million to fund both elements of the demonstration project as follows:

- *Element 1 - $2.5M:*
    - The design, procurement, installation, and testing of the NOC at the BNMC.
- *Element 2 - $2.5M:*
    - Testing, analysis, and modeling of the NOC within the framework of the DSP, as the DSP is defined within the REV Track One Policy Order.

[40] It should be noted that in this event, National Grid would consult with the New York State Department of Public Service to ensure proper regulatory treatment of the NOC's component assets.

Leveraging of Third Party Capital

(Intentionally omitted)

Returns

As discussed earlier in the "Hypothesis Being Tested" section, this demonstration project seeks to determine:

1. What are the functional, operational, and monetary benefits to the electric system and the DSP that flow from the nodal model, or customer aggregation, based on the capabilities of, and access to, customer-to-grid DER?
2. What types of opportunities motivate customer investment in DER assets and participation in animated markets?
    - Is it a tariff (rate) and/or opportunity to generate revenue?
    - What is the monetization delta for the customer?
    - What forms of demand response (or continual demand management) motivate customer investment and participation in electric grid optimization?

Cost Effectiveness

Qualitative and Quantitative Benefits to Ratepayers

It should be noted that this demonstration project cannot presuppose qualitative and/or quantitative benefits for National Grid's customers. It is expected that the conclusions of the demonstration project will inform its level of cost-effectiveness.

Reporting

Information to be Included in Quarterly Reports to the Commission

Quarterly progress reports on the stakeholder and business model work will be provided to the Department of Public Service ("DPS") Staff. These reports will include at a minimum an overview of project progress against timeline/plan and results as they become available. Additionally, in order to maintain flexibility and maximize the potential for innovation and learning the reports may contain other updates or deviations from the initial details provided in this filing. To further ensure alignment, the Company would also like to meet with DPS Staff to discuss the quarterly progress reports. Any changes related to costs shall remain within the overall revenue requirement cap. Furthermore, as highlighted in the DPS letter dated June 24, 2015,[41] should a situation or activity arise that is not authorized by the Commission the Company would include a description in the quarterly report and request such authorization through a petition to the Commission. Lastly, the Company looks forward to continued collaboration with DPS beyond the formal quarterly reports.

[41] Tammy Mitchell and Marco Padula, "Letter to Utility REV Demonstration Project Representatives," Department of Public Service, via email, June 24, 2015.

Conclusion

Post-Demonstration Qualitative and Quantitative Benefits

In leveraging the nodal "test bed" opportunity afforded by the actively engaged and motivated customers of the BNMC, this demonstration project stands to achieve not only a model, nodal interface with the DSP that can be utilized and/or modified by other customers to enable their participation in the market but also an evolving testing platform to evaluate what price signals can effectively engage customers towards the electric distribution system efficiency ends envisioned by the DSP framework. In essence, the proposed demonstration project will proactively create a "living lab" environment that will not only serve to inform National Grid and other utilities' DSPs, but translate the work of the REV Market Platform and Technology Working Group from paper to the marketplace.

Plans to Scale

Please see "Scalability" section above.

As indicated in the demonstration project timeline outlined above, no break points in scaling exist and there is realized value at any point in the demonstration project's proposed elements.

Advantage

The demonstration project seeks to inform and achieve the following DSP functionalities during the course of its two (2) elements:

- Identify and address current and anticipated electric grid needs;
- Facilitate DER-Load-microgrid visibility, cross-communication, monitoring, control, and coordination;
- Facilitate microgrid control and coordination;
- Enable the exchange of historical event information, and;
- Enable the exchange of DER provider data, including estimated hosting capacity.

Resiliency
Demonstration Project Proposal
Potsdam, NY

Niagara Mohawk Power Corporation d/b/a National Grid

July 1, 2015

Executive Summary

This Reforming the Energy Vision ("REV") demonstration project, proposed for Potsdam, New York, focuses on improving customer resiliency during severe weather events. Severe weather events in northern New York State (the "North Country") and elsewhere will most likely continue to occur, potentially with increasing frequency and/or severity due to climate change. Through this demonstration project, Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") will test customer and community willingness to pay for a premium service bringing 21st century resiliency solutions that may also provide every day, "blue-sky" value. The project aims to prototype a scalable stakeholder and business model for a utility offering of community resilience microgrids with local distributed generation.

The Village of Potsdam (the "Village" or "Potsdam") is located in the North Country of National Grid's service territory and includes a population of both permanent residents and university students. Approximately half of the permanent population of 9,428[42] lives in households with incomes below $40,000.[43] Home of the State University of New York at Potsdam ("SUNY Potsdam") and Clarkson University, the Village's population almost doubles with the universities' seasonal population increase of about 8,000 students. In addition to the two universities, commercial customers in Potsdam include multiple municipal buildings, the Canton-Potsdam Hospital, and others. Due to Potsdam's location in the North Country, the availability of emergency services during an extended outage can be limited due to lack of power and/or impassable roads. The latter affects both service providers located miles away, and local service providers that rely on periodic fuel shipments for gas and diesel emergency generators.

A number of community stakeholders including the Village government, two universities, a hospital, and a few small businesses providing necessary services (such as banking, gas and groceries) have expressed an interest in a community resilience microgrid[44] to enable them to:

1. Remain energized and provide services during an extended duration outage;
2. Use Potsdam as a staging ground for county-wide emergency services; and
3. Further optimize the use of distributed energy resources ("DER") to reduce commodity costs.

In building on existing technical work and feasibility studies, the demonstration project will consist of working with stakeholders to reach agreement on the microgrid business model. Stakeholder engagement has already begun as part of the New York State Energy Research and Development Authority ("NYSERDA") funded feasibility study including letters of support in

[42] Based on 2010 Census data from the US Census Bureau for New York.
[43] Internal data.
[44] This is consistent with the Commission's definition of a community microgrid model. *See* Case 14-M-0101 – *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV Proceeding"), Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015) where the Commission defines a community microgrid model as one that "involves multiple customers that may range from large institutions to single dwellings, operates in parallel with the grid but is capable of operating as an island during a grid outage and is powered by one or more distributed generation sources supplemented by storage and/or a load management system that provides resilience in case of grid outage and optimal efficiency during normal operations." (footnotes omitted), at p.110.

the Program Opportunity Notice ("PON") 2715 application from the Village of Potsdam, Clarkson University, SUNY Potsdam, Canton-Potsdam Hospital, and others.[45] Considerations for advancing the business model development with local stakeholders will include costs, payment plans, methods of compensating customer-sited generation, and potentially community or multi-customer distributed generation. The business model development will culminate in a go/no-go decision for microgrid construction and if deemed a "go" will include memorandums of understanding ("MOUs") and/or letters of intent ("LOIs") from each of the stakeholders.

In addition to the community resilience microgrid solution, concepts for resiliency solutions for individual customers will be further explored as part of this REV demonstration project effort. Specifically, battery storage, especially when combined with solar PV, has the potential to provide clean resiliency solutions to individual customers while also providing them and the electric system as a whole with everyday value via optimization. Packaging resiliency with energy efficiency could further enhance the value proposition to customers, providing convenience, comfort, and additional everyday savings, both environmental and other value. Resiliency and energy efficiency solutions, coupled with on-bill repayment, also strongly align with the objectives of the State Energy Plan and REV. To advance the development of such solutions and better engage prospective partners, REV demonstration project funds may also be used for purposes such as market research, and data and analytics.

Business Model Overview

The Market Opportunity

Community resiliency could be improved through the use of community microgrids. However, current regulatory and market barriers, including business models, will need to be addressed.[46]

Proposed Solution

The Company proposes a solution in which it will provide a community resilience microgrid service whereby interested commercial and industrial ("C&I") customers will be aggregated into a hybrid utility microgrid. The wires and controls will be owned and operated by National Grid with customers providing distributed generation and storage ("DG&S") and/or demand response ("DR")/load shed capabilities. DG&S and DR capabilities provided by microgrid customers will be supplemented, as needed, with additional DG&S and/or DR facilitated through National Grid, but provided by a third party. This hybrid utility microgrid is depicted in Figure 13 below.[47]

[45] As detailed in Clarkson University's NYSERDA Program Opportunity Notice ("PON") 2715 application, February 12, 2014 ("PON 2715 application").
[46] New York State Department of Public Service Staff is to issue a detailed proposal on specific microgrid configurations to be presumptively permissible based on parties' comments filed on May 1, 2015 in the REV Proceeding.
[47] *Microgrids for Critical Facility Resiliency in New York State*, *Final Report*, NYSERDA, Report Number 14-36, December 2014 ("NYSERDA Microgrids Report"), Figure 7-6, at p.113.

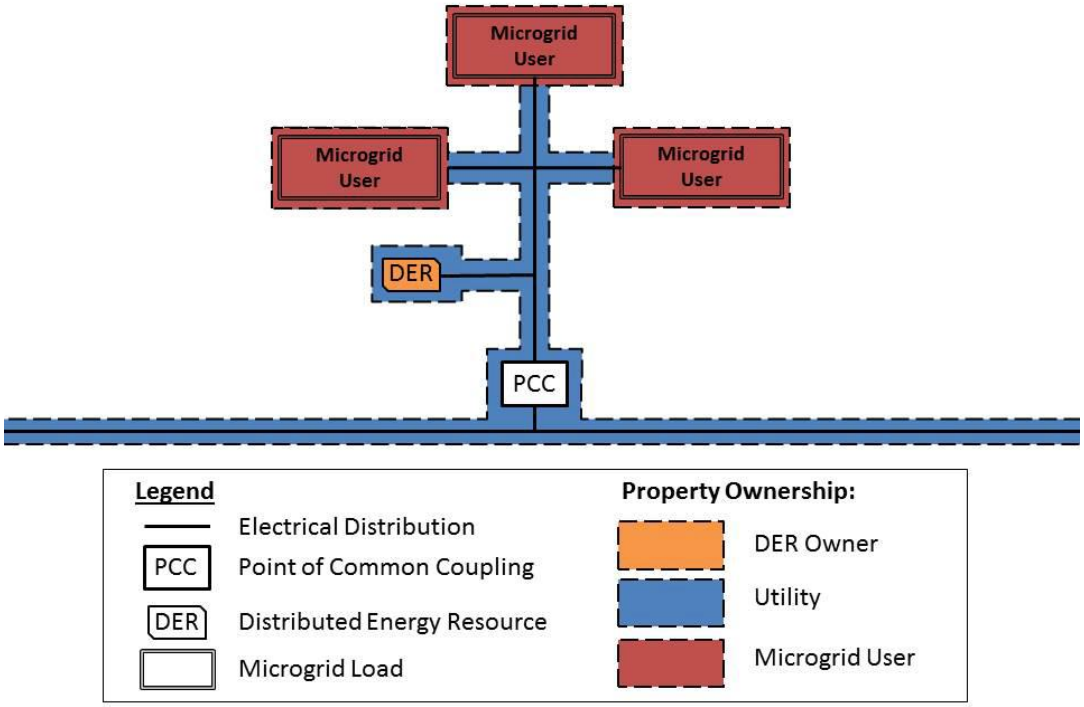


Figure 13: Hybrid Utility Microgrid Model

The initial scope of this REV demonstration project is focused on creating and testing a community resilience microgrid stakeholder and business model framework, culminating in the go/no-go decision. Outputs from the NYSERDA funded feasibility and conceptual design study for the Potsdam Resilient Microgrid[48] will provide the preliminary estimates for wires and control costs, needed additional generation, and the optimal use of existing generation.

The Company anticipates using a process such as the one detailed below:

1. Aggregate interested C&I customers
2. Conduct feasibility and conceptual design study including generation and load requirements for the islanded microgrid
3. Determine cost recovery plan for wires and controllers on a per participant/customer basis based on the results of the feasibility study
4. Determine supplemental community distributed generation, storage, and demand response needs for the microgrid (separate from customer-provided DER) based on the results of the feasibility study and participants' decisions about increased DER investment
5. Determine tariff changes need to compensate distributed generation providers and to cover costs of any community distributed generation in addition to customer supplied distributed generation

[48] PON 2715 application.

6. Determine what entity will serve as the microgrid operator and the method of compensation
7. Provide microgrid participants and municipal government with estimated costs, benefits and duration of on-bill payments.
8. Iterate on steps 1 through 7 as needed to arrive at final go/no-decision with the interested C&I customers
9. If a go, enter into a binding MOU with municipality and microgrid customers to confirm their participation in the microgrid, payments and rights and responsibilities for all parties.
10. File tariff changes with the Commission to reflect any commodity and/or T&D changes.
11. Issue RFP for additional generation, storage or demand response services (if needed) . See Figure 14 below for graphical representation.[49]

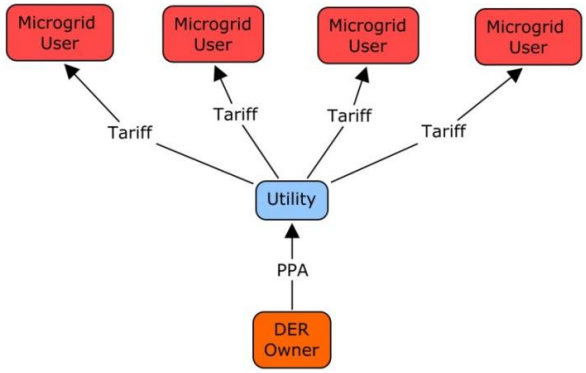


Figure 14: RFP Process for Additional Generation

12. Finalize all agreements, contracts, and microgrid design.
13. File relevant contracts with the Commission.
14. Commence microgrid construction.

For the purposes of this demonstration project step 1 has already been completed and step 2 is underway via a NYSERDA PON award.[50] This demonstration project will address steps 3 through 8 of the microgrid process by prototyping the approach for a business case development for a utility offering of community resilience microgrids.

Hypothesis Tested

While the demonstration project must be conducted to fully vet this business model, it is the Company's hypothesis that customers are willing to pay for a premium service to provide community resilience, enabling improved emergency response and availability of essential services.

[49] NYSERDA Microgrids Report, Figure 7-11, at p. 129.
[50] PON 2715 application.

REV Demonstration Project Principles Addressed

The Company anticipates that this demonstration project will meet all of the following REV demonstration project criteria:

3rd party partners	New Utility Business model	Customer-Community Engagement	Identify Economic Value	Pricing and Rate Design	Transactive Grid	Scalability	Market Rules and Standards	Cost Effective	Timeframe
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Market Attractiveness

Unique Value Proposition: Participating Customers

The value proposition for direct participants differs depending on whether the participant is a load, a generator, or a combination of the two. The value proposition (Figure 15) for this offering is as follows:

The community resilience microgrid solution for commercial and industrial customers provides:

(1) Load participants with an improved outage experience by enabling them to island via affordable, convenient access to backup generation;
(2) Generator participants with the ability to unlock additional economic value from sharing their distributed energy resources; and
(3) Generator and load participants with the ability to unlock additional economic value from sharing their distributed energy resources and a more robust islanding capability (such as redundancy, availability of ancillary services, etc.).

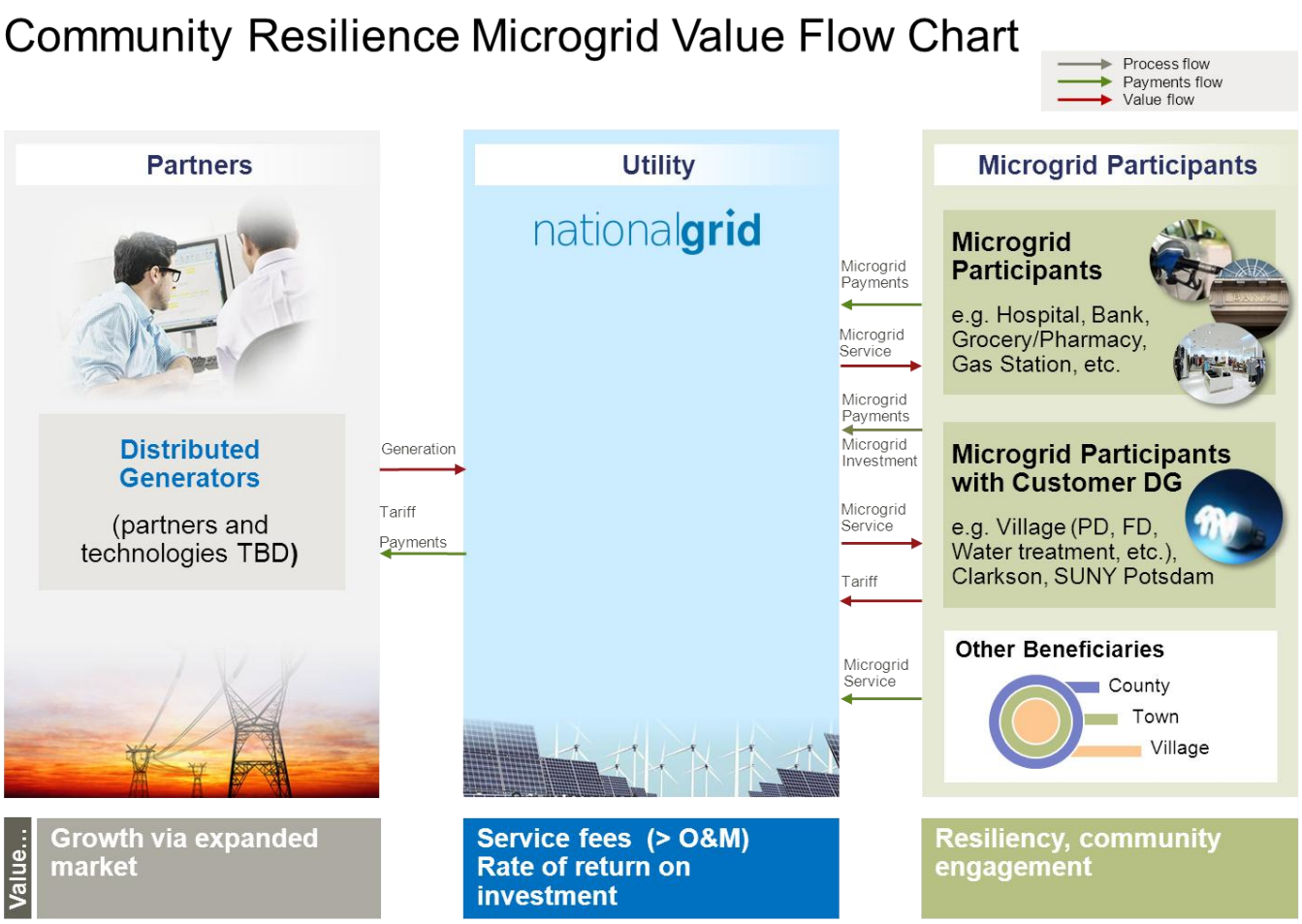


Figure 15: Community Resilience Microgrid Value Flow

Load-only microgrid participants, which may include Stewart's Shops (a gas and convenience store), KeyBank, Kinney Drugs, The Clarkson Inn and others, will benefit from the ability to remain energized during an outage. Additionally, these customers will be able to island during an outage without having to directly purchase, maintain or operate DER. For smaller C&I customers this may present an affordable option for backup power with the maximum amount of convenience when compared with purchasing, maintaining and operating DER without facilitation through their utility company.

Generation-only participants are those that will serve primarily as a generator, such as the Village's East and West Dam hydroelectric generating facilities. These participants will be able to secure or continue to secure economic value for their DER regardless of whether the macrogrid is energized and operational. This may strengthen a future generating customer's business case for DER such as combined heat and power ("CHP") or natural gas-fired generation facilities. Additionally, there may be opportunities to monetize other forms of system value at the wholesale, distribution and microgrid level (e.g., peak shaving and ancillary services).

Customers that have DER, but of insufficient capacity to island on their own, could serve both as microgrid generators and loads. These customers could include SUNY Potsdam and Clarkson University. For these customers, the ability to remain energized during an outage is the main value proposition. For example, SUNY Potsdam and Clarkson University can ensure the safety and well-being of their students during a major outage. A secondary benefit could be the monetization of their DER assets regardless of the energized and operational status of the macrogrid. Lastly, for these types of customers, it may prove uneconomical to invest in sufficient backup power to independently island them. Consequently, by connecting generation resources and loads via the microgrid, they will likely be able to meet their collective backup power needs without a major upfront capital investment and the need for a long-term plan for directly addressing DER operations and maintenance.

Unique Value Proposition: Third Party

The value to third-party distributed generation developers will be a long-term revenue stream guaranteed by the Company on behalf of the microgrid participants in the form of a tariff. This will remove some of the risk for a generation developer in a region where wholesale generation is plentiful, but too far removed from the microgrid to tap into for islanding purposes. The tariff for third-party distributed generation will include terms for emergency and "blue-sky" operations, which may include commodity service for microgrid participants.

Unique Value Proposition: Utility

The main value to National Grid is the potential for additional revenue from a scalable community resilience microgrid offering. Additional details for a potential revenue model are provided in Section 5(a) New Utility Revenue Streams. Lastly, both National Grid and its customers will benefit from improving critical customer resilience without otherwise hardening or undergrounding the local distribution and transmission system.

Customer Segmentation and Demographics

This offering is available for direct participation by the C&I customer segment. There are other broader beneficiaries including the residential segment, which will benefit from improved emergency response and access to essential services that will remain energized.

Channels

The channels for marketing and outreach will consist of community meetings, individual customer and stakeholder outreach, and continuing support from National Grid's community and customer management lead in Potsdam.

Scalability

The Company will take into consideration program design and data evaluation, measurement and verification ("EM&V") in order to ensure that lessons learned from this demonstration project could be scalable and standardized to apply to other regions of National Grid's service territory and other utility service territories in New York State. At the conclusion of the demonstration

project, National Grid will have the experience needed to create an initial end-to-end process for a hybrid utility microgrid service. Any interested municipality, or group of C&I customers located in close geographical proximity, should be able to use this process.

Demonstration Plan

Metrics for Success

Given that this demonstration project focuses on the development of a business model for a community resilience microgrid and aims to prototype a replicable process for stakeholder and business model development of community microgrids, the following qualitative metrics will be used to define success:

- Did the microgrid successfully reach a "go" decision?
    - In order to be successful, a sufficient number of the participating C&I customers must agree to be a part of the microgrid with all of its associated costs and benefits.
- Will a majority of costs be covered by the direct participants of the microgrid?
    - In order to be a sustainable solution, a community must demonstrate a willingness to pay for increased resiliency. Furthermore, the majority of the costs must be borne by the direct participants and broader beneficiaries rather than through grants, subsidies, or socialization of capital costs by all utility customers.

Timelines, Milestones, and Data Collection

i. Implementation Phase

The following Figure is a draft timeline of the stakeholder and business model development process to be used for this project:

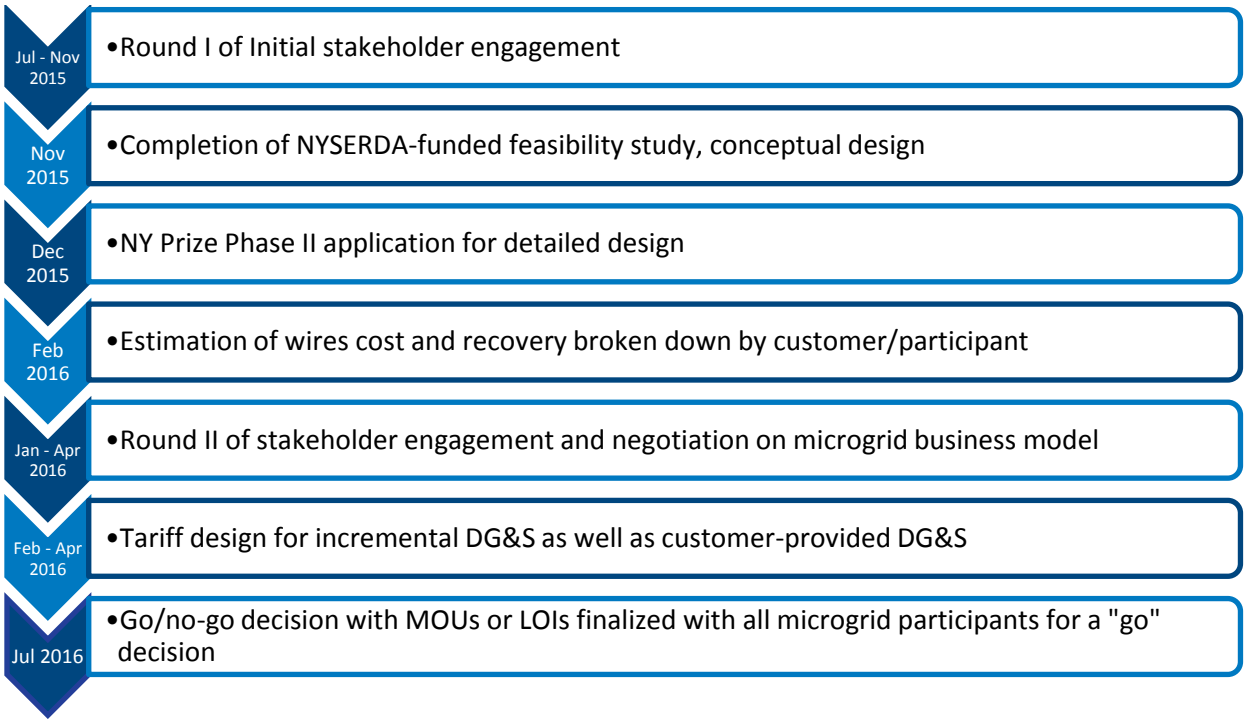


Figure 16: Resiliency Microgrid Draft Timeline

ii. Evaluation Phase

The evaluation will be a simple assessment against the metrics of success. Should the microgrid reach a "no-go" decision there will still be a substantial amount of lessons learned that the Company can share with peer utilities and policy makers. Should the demonstration project reach a "go" decision, there will be more to evaluate during its subsequent construction and operation phase.

Participation

Target Population, Sample Size, Control Group

The target population for this demonstration project consists of thirteen (13) discrete customer loads which are already undergoing a microgrid feasibility and conceptual design study. [51]

The feasibility and conceptual design study includes the following customer loads:

- Universities
  - SUNY Potsdam
  - Clarkson University
- Village of Potsdam Municipal Buildings
  - Police Department (co-located at the Civic Center)
  - Fire Department & Civic Center
  - Water Treatment Plant

[51] As detailed in PON 2715 Application and with the addition of Kinney Drugs.

  - Wastewater Treatment Plant
- Potsdam High School
- The Clarkson Inn
- Canton-Potsdam Hospital
- Stewart's Shops
- KeyBank
- Kinney Drugs
- National Grid Service Center

And has the following conceptual configuration as shown in Figure 17 :[52]

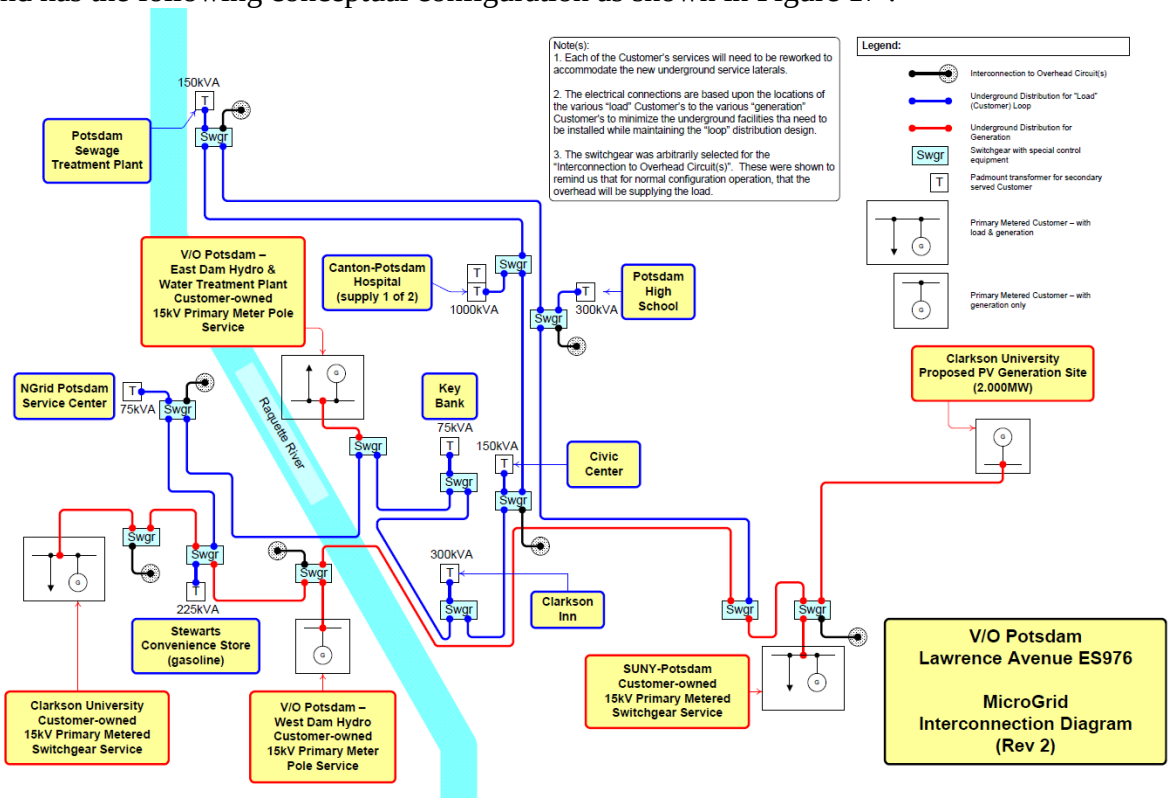


Figure 17: Resiliency Feasibility and Conceptual Design Study

Third-Party Partners

The Company anticipates that some amount of additional generation in the range of 2 to 4 MW of capacity may be needed for the microgrid to island (assuming the full inclusion of existing run-of-river hydro generation, CHP generation and solar farm). If customers within the microgrid determine that their business case is adequate to build all of the additional generation needed on the customer side of the meter, then no additional generation will need to be facilitated by National Grid. However, the Company believes that some amount of community distributed generation may be needed, likely in the form of natural gas-fired generation. There may also be a need for a grid-scale energy storage unit to provide ancillary services needed by the microgrid such as voltage and frequency support. In both cases, the Company anticipates

[52] From Clarkson University's NYSERDA Program Opportunity Notice ("PON") 2715 application, February 12, 2014.

issuing a request for proposals ("RFP") once the scope of the services needed are better understood through the completion of the on-going microgrid feasibility[53] study and stakeholder work. Any additional generation, storage or demand response may be secured through a new tariff by the Company and repackaged as a commodity and service tariff for customers to utilize the community distributed generation during both everyday/"blue-sky" scenarios and during an outage when the microgrid is islanded.

Utility Resources and Capabilities

A utility company is uniquely positioned to facilitate community resilience microgrid development. Given the Company's core competency in the design, construction and operation of the macro electric grid, the Company can bring those skills to the design, construction and operation of a limited underground network to support a community resilience microgrid. Additionally, given the Company's existing billing relationship with all customers in its service territory, it has the capability to craft new tariffs, subject to Commission approval, and bill accordingly to ensure that all microgrid participants pay for the services they receive, and are paid for the services they provide. Lastly, National Grid has existing relationships with major C&I customers, critical customers and the local governments in the communities we serve. With coordination of multiple non-affiliated customer entities being one barrier to community resilience microgrid adoption, the Company is in the prime position to be the "glue" that can bring these customers together and creatively serve their resiliency needs through this REV demonstration project.

Community Outreach / Community Engagement

Outreach to Affected Communities

As stated earlier in this proposal, stakeholder outreach and engagement has already begun as part of the NYSERDA funded feasibility study. Formal letters of support were included in the Company's NYSERDA PON 2715 application from the Village of Potsdam, Clarkson University, SUNY Potsdam and the Canton-Potsdam Hospital. In addition, the Company has recently participated in several meetings with the full stakeholder, study and design teams, the Village Administrator, Clarkson University, and SUNY Potsdam regarding this REV demonstration project proposal.

Motivating Customers / Communities

Customers in this community are already fairly motivated to advance a community resilience microgrid. As stated in the Company's NYSERDA PON 2715 Application:

> Catastrophic weather events in the North Country of Upstate New York have caused widespread property and environmental damage. Although these events are infrequent, they seem to be occurring with more regularity. The risk to residents and coordination of emergency services is extremely challenging. Such events include ice storms, major snow events, micro-burst wind events, and flooding due to winter thaw, ice jams, and excessive rain. One of the most

[53] As detailed in PON 2715 application.

devastating events was the ice storm of 1998, which affected most of northern New York, southern Canada, and northern New England, causing outages lasting for weeks. Restoration costs in upstate New York alone exceeded $125M (1998 dollars). Multiple other events of lesser magnitude have followed, including the most recent ice storm in December 2013.[54]

As an example of the level of motivation from customers in building a community resilience microgrid, Clarkson University has been contemplating using a microgrid to support the resilience of its campus since at least 2003 when it partnered with the Electric Power Research Institute ("EPRI") to design a multi-energy park (i.e., a microgrid) at Clarkson University.[55] Given the longstanding weather-related challenges as well as past and current customer interest in leveraging community microgrids to improve resilience, the Company remains optimistic in the level of motivation of these customers and their community.

Conditions / Barriers

Market rules and standards

A barrier to deployment of the microgrid may be the restructuring of existing remote net metering arrangements and PPAs. For example, the existing run-of-river hydroelectric generating facility, the West Dam Hydro, is owned by the Village, but operates through a remote net metering arrangement where Clarkson University serves as the co-operator of the facility and receives the benefits of net metering credits. Another example would be Clarkson University's existing 2 MW solar PV farm, which is under a long-term PPA with the solar developer. As part of the stakeholder and business model work, new or modified contracts may need to be put in place for existing generation to be used for the community resilience microgrid.

An additional barrier in the community resilience microgrid market is liability agreements. When the microgrid is operating in islanded mode there is a risk of damage to customer equipment due to problems with voltage and frequency regulation or to customer generation equipment due to controller failure or error. Lastly, there will likely be additional complexities in entering into agreements involving public entities such as the Village government and the SUNY system.

Consumer Protections

The Company will adhere to any existing and applicable consumer protection and privacy laws. Additionally, no capital will be invested in the microgrid until after there is a "go" decision with binding agreements for the microgrid costs, payment plans, compensation for customer provided DER and Commission approval where required.

[54] From Clarkson University's NYSERDA Program Opportunity Notice ("PON") 2715 application, February 12, 2014, at p.7.
[55] *Partial Design of a Multi-Energy Park at Clarkson University*, EPRI, report number 1002286, December 2003.

Channel or Market Challenges

The Company does not know of any community resilience microgrids that have been built and have achieved commercial viability without substantial grant, subsidy, rate base or other support. This demonstration project is believed to be the first of its kind in that, if successful, it would be the first community resilience microgrid substantially funded by its participants and broader beneficiaries. Furthermore, the Company believes that learning from this stakeholder and business model work may yield a replicable process for other utility offerings for community resilience microgrids. That said, some degree of customization is needed both on the technical and business model side. As a result, there is some risk of over-customization. The Company will strive to help stakeholders reach a "go" decision while continuously identifying the aspects that could be scaled and standardized while accommodating sufficient customer/community diversity and customization.

Financial Elements / Revenue Model

The culmination of this demonstration project will be a financial or business model complete with revenue opportunities for the utility and customers with DER assets. While a complete model will not be arrived at until the completion of the demonstration project, the Company anticipates that it will build from the following conceptual model.

New Utility Revenue Streams

New utility revenue may come from the two sources described below; however the stakeholder and business model work might yield a better alternative.

The first will be a premium charged to direct participants for the capital investment needed to build out the underground network and controller for the community resilience microgrid. There exists the possibility to recover some portion of these costs from the broader beneficiaries in the area. This targeted and potentially multi-tiered approach differs from typical utility recovery via rate base.

The second revenue stream will likely come in the form of a service fee charged to the microgrid participants to cover ongoing O&M costs and a modest margin for the facilitation services such as securing community distributed generation to complement customer provided DER assets.

Investments

There are three main categories of investments that need to be included in the business model development. The first is the capital investment for the underground wires and the microgrid control system. The second is for supplemental community distributed generation and storage. Lastly, the third is for dynamic demand response or load shedding capabilities.

Returns & Cost Effectiveness

The return on investment for all parties (utility, partners, and customers with DER assets) will have to be calculated as part of the stakeholder and business model work. The returns will vary depending on the final underground system design, the amount of DER assets provided by customers and the amount of supplemental distributed generation and storage needed.

The cost effectiveness of the community resilience microgrid will be determined through the stakeholder and business model work. While the demonstration project is needed to arrive at final cost, repayment, and benefit calculations; the Company hypothesizes that it will be more economical for customers to pool DER, control systems, and operations and maintenance through a community microgrid than to have each customer finance, install and maintain 100% of their own backup power. For the customers who currently have backup power, the community microgrid may provide additional value through ancillary services such as voltage support and frequency regulation and potential revenue streams from compensation for use of their DER assets. Additionally, the Company will strive for majority funding of the microgrid through participants and broader beneficiaries, limiting the burden on all utility customers while creating an overall more resilient system. Ultimately, the cost effectiveness of the construction and operation of the microgrid will be a major input into the stakeholder and utility decision making process that will culminate in the go/no-go decision at the conclusion of this initial demonstration project.

Reporting

Information to be Included in Quarterly Reports to the Commission

Quarterly progress reports on the stakeholder and business model work will be provided to the Department of Public Service ("DPS") Staff. These reports will include at a minimum an overview of project progress against timeline/plan and results as they become available. Additionally, in order to maintain flexibility and maximize the potential for innovation and learning the reports may contain other updates or deviations from the initial details provided in this filing. To further ensure alignment, the Company would also like to meet with DPS Staff to discuss the quarterly progress reports. Any changes related to costs shall remain within the overall revenue requirement cap. Furthermore, as highlighted in the DPS letter dated June 24, 2015,[56] should a situation or activity arise that is not authorized by the Commission the Company would include a description in the quarterly report and request such authorization through a petition to the Commission. Lastly, the Company looks forward to continued collaboration with DPS beyond the formal quarterly reports.

[56] Tammy Mitchell and Marco Padula, "Letter to Utility REV Demonstration Project Representatives," Department of Public Service, via email, June 24, 2015.

Conclusion

Post-Demonstration Qualitative and Quantitative Benefits; Plans to Scale

Post-demonstration, the Company will determine if a utility offering community resilience microgrid is feasible and scalable at that point in time. Assuming that the demonstration project reaches a "go" decision, the Company will have a prototype of the stakeholder, business model, and technical study processes needed to offer, finance and build community resilience microgrids.

Advantage

With over *100 NY Prize* applications, this demonstration project can provide lessons learned useful not only to National Grid, but to other electric utilities, policy makers and regulators as they determine how to best fund and advance community resilience microgrids throughout New York State. While there is a great deal of technical promise in community resilience microgrids, there are still many barriers to overcome in terms of community resilience microgrid business models. The Company believes that it can make meaningful progress in helping New York solve this challenge through this REV demonstration project.

Customer Convenience Demonstration Project Proposal

Town of Clifton Park

Niagara Mohawk Power Corporation d/b/a National Grid

July 1, 2015

Executive Summary

The proposed demonstration project of Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") for the Town of Clifton Park ("Clifton Park" of the "Town") provides National Grid customers with tools, data, and information to help them make informed decisions on how to leverage and integrate distributed energy resources ("DER").[57] The growth of DER translates directly into increased customer participation in energy efficiency programs, growth in renewable energy adoption and, ultimately, reductions in energy prices from forecasted levels absent these actions in addition to reductions in carbon emissions.

The proposed Reforming the Energy Vision ("REV") demonstration project for Clifton Park offers customers new and simplified energy plans that are designed to positively impact their experience, reduce their carbon footprint and increase the valuation of their homes and businesses. The demonstration project is intended to achieve more efficient use of energy, higher penetration of renewable energy resources, and new and flexible energy services with limited modernization of the electric distribution infrastructure while reducing customer price uncertainty through predetermined and levelized electric and gas bills ("energy bill"). Additionally, by providing customers with near real-time data and practical and pro-active feedback, notifications, and recommendations, customers are able to make better informed decisions regarding DER investments and management of their energy use.

In order to facilitate a maximum penetration of DER while achieving an increase in electric system efficiency, this demonstration project will provide for intelligent grid devices, including cellular modem- based interval meters capable of providing customers with electric energy usage on a near real-time basis, and grid devices to optimize the distribution voltage for enhanced efficiency. Higher than current level penetrations of customer-sited distribution generation are also being proposed as an important aspect of this demonstration project. In addition, the Company is proposing to replace a small percentage of the streetlights in Clifton Park with LED streetlights that will be equipped with energy meters, communication devices and supervisory controls. The purpose of this will be to test whether an enhanced street lighting infrastructure provides Clifton Park with efficient options to maximize the use of the street lighting infrastructure for services that are other than illuminating roadways.

Business Model Overview

Clifton Park, a predominantly residential community with a majority of residents being medium-to-high income, is surrounded by advanced technology companies, research centers, and universities.[58] Clifton Park was selected due to the support the Company received for this demonstration project from the residents and the Town's management team. Additionally, the population and electric load growth coupled by the proximity of the Town to the state and private universities were factored into the selection criteria.

[57] For the Clifton Park Demonstration project, "DER" is defined as including energy efficiency, demand response and distributed renewable generation offerings.
[58] Demographic information is provided below in the Customer Segmentation and Demographics Section.

Clifton Park presents several opportunities to test the REV demonstration principles outlined in the Commission's "Memorandum and Resolution on Demonstration Projects."[59] These opportunities include:

1. Providing residential and small commercial customers with timely access to electric and gas energy consumption information allowing for greater comprehension of the impact of their actions on energy consumption;
2. Increasing customers' participation in DER through education on its benefits, easing the impact on the upfront cost of DER devices, and improving customers' understanding of vendors' offerings;
3. Deferring the need for upgrade to the electric distribution system to meet Clifton Park's growing population and energy consumption;
4. Utilizing new technologies aimed at frequently optimizing the distribution voltage to reduce losses and energy consumption for all customers; and
5. Incorporating new streetlight technology with energy meters, controls and communications to test the potential market for value-added information services coupled with advanced metering and controls on the streetlight infrastructure.

Through this demonstration project National Grid, working in conjunction with its partners, will provide the aforementioned opportunities in a controlled environment. The lessons learned will assess customers' interest in levelized and predictable energy plans that enhance the offering and value of DER technologies, reduce acquisition costs, assess responsiveness to information, provide input to the regulatory and rate design process, and provide opportunities for energy technology partners to present effective means to integrate DER into their portfolio of product offerings. Additionally, the lessons learned from this demonstration project will provide valuable experience with respect to DER integration into electric system reliability plans, shape how DER can be integrated on a larger scale, test the various business models and revenue streams, and assess customer participation levels.

Challenges Being Addressed

This demonstration project will provide solutions that will address the following issues that are hindering broader energy efficiency and clean energy adoption by small commercial and residential customers:

Challenges Addressed in Year One:

- Lack of detailed, meaningful and dependable near real time energy data and usage information at the individual customer level[60]
- High upfront capital costs of renewable energy projects which prohibit many residential customers from installing renewable energy systems
- Fluctuating customer energy bills
- Low customer capability to effectively manage energy usage
- Low participation in electric and gas energy efficiency programs

[59] Case 14-M-0101 – *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV proceeding"), Memorandum and Resolution on Demonstration Projects (issued December 12, 2014).

[60] The installation of interval meters will allow for near real- time communication back to customers on their energy usage with opportunities to reduce usage and participate in demand response programs. This differs from the current OPower behavioral program available to approximately 3,500 electric and gas customers in Clifton Park.

Challenges Addressed in Years Two and Three:

- Inability to determine a fair compensation for the benefits of DER to the grid, including which parties should receive financial compensation.
- Inability to optimize operating parameters (such as voltage) in the electric distribution system to allow the integration of customer-sited distributed generation such as solar photovoltaic ("PV"), wind and micro-combined heat and power ("CHP") systems.
- Inability to aggregate residential DER during adverse system conditions through participation in demand response programs Low adoption of renewable energy
- Inability to maximize the efficiency and the benefits that towns and cities can realize from new services that could be made available to street lighting customers.

Proposed Solution

Through this demonstration project, National Grid, working with its partners, is proposing to replace the existing electric revenue meters installed at residential and small commercial customers' premises in Clifton Park with revenue meters that have the capability of communicating, through cellular technology, near real-time interval data to these customers. These replacements are necessary to:

1. Provide customers with access to near real-time data about their electrical consumption
2. Provide knowledge of loads that are contributing to this consumption
3. Communicate messages to customers about their energy consumption in a timely manner for decision making on consumption by the customer and,
4. Allow valuation of demand response that can be achieved at each customer premises.

Customers who do not wish to have interval meters installed at their premises can elect to opt out from this demonstration project and their service and bills from the Company will continue to be as it is currently provided without any change. For those customers who do not opt out of this program, National Grid, working with its partners, will provide a value added service to residential and small commercial customers in the demonstration project through a tiered Energy Service Plan. The delivery of year one solutions is not expected to end in year one; however, lessons learned from the year one solutions will be utilized to modify the project offering and structure. The demonstration project is envisioned to have four energy plans that will have different price points and can be customized to meet the needs of the majority of the customers in Clifton Park. The four Energy Service Plans are described below:

Base Energy Plan

Eligible participating customers who are on the Base Energy Plan will receive a levelized bill over a-twelve-month period. The levelized bill will be calculated using customer's historic electric and gas usage levels, forecasted electric and gas consumption, and projected energy prices to predetermine the monetary bill amount. These customers will have access through the internet to their interval electric usage and their monthly gas usage. Additionally these customers will receive notifications, either through emails or text messages, when they approach their predetermined monthly bill amount along with recommendations on how they can avoid exceeding their predetermined amount. Customers who exceed their predetermined monthly

usage will be charged the tariff rate for the extra usage for that month and the charges will be added to following month's bill. The charges for the extra usage will be assessed based on a pre-established rate that is reflective of the electric and gas rates inclusive of all the applicable charges; such as system benefits charges, delivery and supply charges, etc. At the end of the-twelve-month period customers' usage and bill amounts will be reassessed to determine the new optimal levelized bill for the upcoming twelve months period. This reassessment of the bill is needed as customers occasionally add and remove energy loads. It is envisioned that the availability of information, including near real-time data, coupled with the proactive and customized notifications, will encourage customers to adopt a more energy efficient life style.

Silver Energy Plan

Eligible participating customers who voluntarily select The Silver Energy Plan will receive the same benefits as the customers who are on the Base Energy Plan plus all or some of the following items as applicable:

a) A reduced levelized bill that is lower than the levelized bill offered in the Base Energy Plan.
b) An installed smart thermostat that is capable of being controlled and programmed remotely
c) Five LED light bulbs
d) An energy audit

The customers' energy data and audit result for those on the Silver Energy Plan will be shared with partners to allow partners to develop and recommend targeted services and products that could add comfort, convenience, home valuation, and strategies for efficient use of energy. Customers who opt out from sharing their data with partners will still be able to participate in this Plan but their energy data will not be shared with participating partners. At the end of the twelve-month period customers' usage and bill amounts will be reassessed to determine the new optimal levelized bill for the upcoming twelve months period. This reassessment of the bill amount is needed as customers occasionally add and remove energy loads, as well as to offset the cost of installed energy saving devices in order to reduce the payback period to customers.

Gold Energy Plan

Eligible participating customers who voluntarily select the Gold Energy plan will receive all of the benefits listed under the Silver Energy Plan plus all or some of the following items, as applicable:

a) Energy efficient appliances such as an energy efficient heat pump water heater, and energy efficient washing machine and clothes dryer, all of which have the ability to be controlled and programmed remotely.
b) A second installed smart thermostat that is capable of being controlled and programmed remotely and through the internet
c) Five more LED light bulbs

d) Two hard wired load control devices and two plugged in load control devices that are capable of accepting control signals remotely

The customer energy data and audit result for those customers who are on the Gold Energy Plan will be shared with partners to allow partners to develop and recommend targeted services and products that could add comfort, convenience, home valuation, and strategies for efficient use of energy. Customers who opt out from sharing their data with partners will be able to participate in the Base or the Silver Energy Plans and their energy data will not be shared with participating partners. At the end of the twelve-month period customers' usage and bill amounts will be reassessed to determine the new optimal levelized bill for the upcoming twelve months period. This reassessment of the bill amount is needed as customers occasionally add and remove energy loads as well as to offset the cost of installed energy saving devices in order to reduce the payback period to customers.

Platinum Energy Plan

Eligible participating customers who voluntarily select to this Plan receive all of the benefits listed under the Gold Energy Plan plus all or some of the following items as applicable:

a) the opportunity to install a solar PV system on their roof through an approved partner
b) the opportunity to perform home weatherization through an approved partner.

Customers who are on the Gold and Platinum Energy Plans will be assessed a fixed monthly charge to finance portion of the cost of the added items. The monthly charge will be included as a line item on the levelized energy bill and will be targeted to provide a-three- to five-year simple payback for customers on the Gold Energy Plan and a-ten- to twelve year simple payback for customers who are on the Platinum Energy Plan. National Grid or its partner will collect these charges through the levelized bills and pass them on to the partners who supply the different products and services. Because the installation of a solar PV system can significantly reduce the electrical consumption of a customer, customers who elect to install a PV system through this Plan will get a reduced levelized bill after the PV system is placed in service. At the end of the-twelve-month period customers' usage and bill amounts will be reassessed to determine the new optimal levelized bill for each customer for the upcoming twelve months period. This reassessment of the bill amount is needed as customers occasionally add and remove energy loads and to offset the cost of installed energy saving devices in order to reduce the payback period to customers.

Hypothesis Tested

The Company and its partners will test the validity of the hypotheses shown in the table below. The results associated with testing each of the hypotheses will be tracked and documented. The results of the tests will be used to modify the hypotheses and the program offerings.

	Customer	Partner	National Grid
Hypothesis	New and simplified energy plans and access to near real-time data will have a positive impact on customer experience, reduce energy consumption, and reduce customers' carbon footprint.	Leveraging the utility reputation and energy experience reduces risk and increases customer acquisition leading to higher DER penetration.	Targeted system improvements enhance the utilization of the existing systems.
	Proactive, personalized simple messaging leads to productive action by customers	Access to customer energy consumption will help in delivering beneficial and personalized services and products.	Higher penetration in DER and enrollment in DR program could reduce wholesale energy costs and potentially defer utility capital investment.
	Customers are willing to pay extra for additional value they receive from products and services	Partners are willing to invest upfront capital in order to acquire market share	Utilities that are willing to take risk will be rewarded at a higher level.

Revenue Streams to Fund Demonstration Project

The following list the different revenue streams that partners and the Company can leverage to offset the demonstration project:

- Partners' lead generation
- Sale of big data analytics to partners
- Retained customer energy savings
- Customer acquisition fees paid by partners to the Company or other partners
- Demand Response revenues
- Energy efficiency program incentives
- NYSERDA SBC funds
- REV demonstration funding
- Federal and state tax credits

- New incentives for achieving higher energy efficiency goals
- Incentives and fees for achieving targeted and system level residential demand response goals
- Incentives for wider and deeper implementation of DER Interest on upfront capital investment

Years Two and Three Solutions

In years two and three the Company, in collaboration with partners, will continue to offer the year one solutions with modifications that are based on the evaluation and lessons learned through the implantation of the demonstration project in year One. Additionally, the Company, working with its existing and additional partners, will begin the deployment of additional products and services to further enhance the customer experience, reduce demand and energy consumption, allow for higher rate of adoption of renewable energy sources, aggregate residential demand responses opportunities, and bring additional services and job opportunities to Clifton Park and surrounding towns and cities. The years two and three solutions will be testing whether the following can achieved:

- Installation of electric distribution grid technology to optimize the operation of the grid through better management of delivered voltage and reactive power. It is expected that the implementation of this technology could potentially yield an approximate 2.5% of electric energy savings for Clifton Park electric customers. Additionally, with faster and targeted voltage control along the distribution system it is believed that higher adoption of distributed generation renewable energy becomes more feasible. Moreover, technological advancement in voltage optimization and controls could better manage the integration of renewable energy system along the distribution systems. The hypothesis that will be tested is whether all the aforementioned in combination could reduce the peak demand consumption, save energy for all customers and increase the penetration of distributed generation.
- Using the installed products and appliances within participating customers' homes and small businesses and leveraging technology to simplify, automate and integrate the participation in residential peak demand response program.
- Retrofit a sample of street light assets with fixtures that include LED lights, advanced controls and communications, and instrumentation to accurately capture the energy consumption of these assets. Through the retrofitting of the street lights it can be demonstrated whether additional benefits, above and beyond reduced energy consumption, the better light output and longer fixture life, can be achieved and be beneficial to Clifton Park and other municipalities. Among these benefits are remote access to supervisory controls of the light fixtures and the integration of additional services, such as the installation of security cameras and the delivery of Wi-Fi services.

Funding Sources for Years Two and Three Solutions

To fund the different components of years two and three solutions the Company and its partners will pursue the following:

- The Company will recover the capital and operation and maintenance cost of the required hardware, software and supporting systems required to perform the different voltage

optimize schemes under the REV demonstration project cost recovery mechanism. The approximately 2.5 % energy savings and demand reduction achieved by the implementation of this technology will be monetized and used to offset the revenue requirement for this project. Customers will see an approximately 2.5% reduction in their electric bills as a result of implementing this technology only after the cost of the implementation is paid for in full. Partners who provide products and services toward this technology will be paid from portion of the savings.

- The monetary value from aggregating and selling the residential demand response, which can be achieved through the services and products installed under the Silver, Gold and Platinum Energy Plans described above, will be used to fund the partner and needed equipment that are responsible for the aggregation and integration of the residential response program.
- The Company through the allocated REV demonstration funds will recover the capital and operation and maintenance cost of the required hardware and software required to retrofit and street light infrastructure and its supporting systems. The energy savings achieved by the streetlight infrastructure will be monetized. A portion of the monetized value will be returned to the town to offset its energy cost while the remaining amount will be used to offset the revenue requirement for the streetlight retrofit. The town of Clifton Park will realize the full benefits of the energy saving achieved by the LED retrofit when the street light retrofit is paid for in full.
- The Company and its partners will leverage any available state or federal grants to offset the cost of years two and three solutions.
- The Company and its partners will pursue all in-kind services that may be available by vendors or external investors.

REV Demonstration Project Principles Addressed

The Company anticipates that this demonstration project will meet all of the following REV demonstration project criteria:

3rd party partners	New Utility Business model	Customer-Community Engagement	Identify Economic Value	Pricing and Rate Design	Transactive Grid	Scalability	Market Rules and Standards	Cost Effective	Timeframe
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

The proposed REV demonstration project addresses most core REV principles with particular emphasis on “Third Party Participation” “Pricing and Rate Design “Scalability” and “Customer and Community Engagement”

Market Attractiveness

Unique Value Proposition

A simple opt-out pricing plan with the installation of advanced meter functionalities provides residential and small business customers predictable monthly bills, near real-time energy usage

information, and the option to upgrade to premium bundled packages with convenient, energy efficient, and personalized solutions that enable them to better manage their energy usage. Additionally, this may potentially defer distribution investment necessary to serve load growth and overall community load. Customer value propositions that will be exhibited in this demonstration project include flexible energy management solutions and services, ease of predictable billing, DER and home improvements that will enhance the value of residential and commercial property by adding comfort and convenience with little or no upfront payment.

Through research on customers' interest and needs for grid modernization, National Grid's NY residential and small and medium business customers surveyed indicated they want more transparency into their energy usage to better understand bill impact, energy pricing options that more accurately reflect their energy usage patterns, and solutions to help better manage their energy usage. A majority of both residential and business customers also expressed an interest in devices that can help them manage their energy use, including interactive and programmable thermostats that they can control remotely and program themselves based upon usage patterns. The Company's research also shows that customers expect National Grid to play a key role as a provider of information as well as a provider of solutions across energy management services. [61]

The monthly bill is the most frequent, and in some cases, the only customer touch point and yet is not well understood. A 2012 Billing Study found that customers did not generally understand delivery and supply charges, what is regulated and whether the utility is able to adjust rates unilaterally[62]. For example, 61% incorrectly thought they could choose their delivery company and slightly less than one-third of customers didn't know if supply or delivery charges are regulated or if National Grid can simply adjust fees to increase profits.[63] This demonstrates that customers generally have limited understanding of energy supply and energy delivery.

[61] National Grid Value Proposition Research, Spring 2014.
[62] Assessment of National Grid Residential & Commercial Billing, November 2012
[63] Assessment of National Grid Residential & Commercial Billing, November 2012

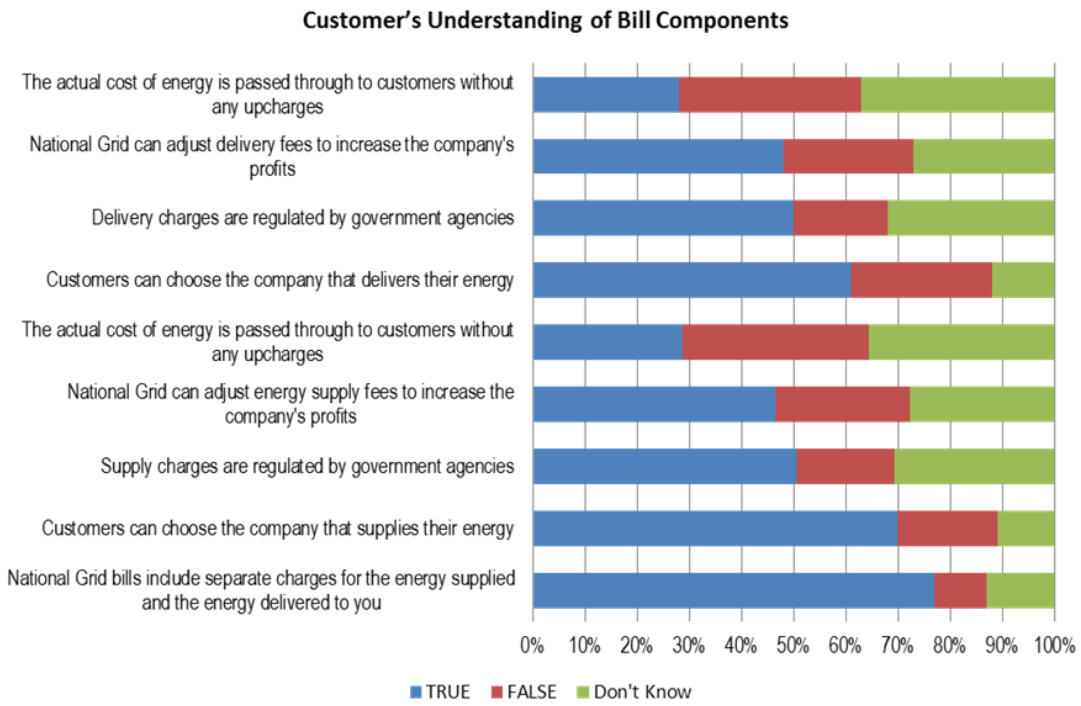


Figure 18: National Grid Residential & Commercial Billing, November 2012

Choice architecture can enable better customer decision-making Behavioral science, utility peer studies and recent experience in other industries show the importance of good default options for time-varying rates and other customer choices. Default options can increase participation/enrollment. For example, analysis of customer enrollment patterns in time-based rate programs as part of the DOE Smart Grid Investment Programs (SGIG) showed that for the 19 solicitation efforts that had occurred for the SGIG consumer behavior studies so far, recruitment rates range from 5% to 28% for opt-in offers, while those using opt-out offers have recruitment rates that range from 78% to 87%.[64]

While customers want greater levels of choice, overloading customers with too many choices results in decision inertia. Behavioral science research on choice that has been conducted on retirement savings plans and consumer products illustrate this point. For example, a study analyzing the retirement savings decisions of nearly 800,000 people from about 650 different 401(k) plans found that predicted individual participation rate drops by approximately 2% for every additional ten funds, controlling for individual and plan-level variables.[65] A well-known field experiment on choice overload conducted on specialty jams arranged at a grocery store

[64] U.S. DOE "Analysis of Customer Enrollment Patterns in Time-Based Rate Programs – Initial Results from the SGIG Consumer Behavior Studies"(July 2013).

[65] The retirement plans ranged from two to 59 funds, with the majority offering 10 to 30 funds. When two funds offered, participation rates were at 75%, dropped to 60% when 59 funds were offered.
Iyengar, Sheena S., Wei Jiang, and Gur Huberman. 2003. "How Much Choice Is Too Much? Determinants of Individual Contributions in 401(k) Retirement Plans." Working paper presented at the Wharton Pension Research Council. April 2003. Retrieved at http://system.nevada.edu/Nshe/?LinkServID=3F1030DA-E201-CE84-D4690C6A61458841

showed that extensive product assortment can be initially appealing to customers, but it can reduce subsequent motivation to purchase.[66] 60% of customers approached the jam sampling booth when offered 24 flavors compared to 40% when offered 6 varieties; however, 30% of those offered the limited selection purchased a jar of jam in contrast to 3% of those offered the extensive assortment. [67]

Providing convenience and relevant, actionable information can also help to make decisions easier. Customers don't just want an advisor – they want a provider who can help them manage and simplify their lives. In an industry report, close to 50% of customers would be willing to exchange savings on their energy bill for the convenience of using energy when it best suits their lifestyle.[68] Customers want information that is personalized and insight-based, finding it more valuable than any other type of information.[69]

Customer	Partners	National Grid
Options to manage energy usage	Potential for new products and services through the gathered data	Load growth management and deferment of investment
Newer, smarter, and more efficient appliances	Increased sales of devices	Incentives for achieving targeted and system level DR
Simplicity and remote access to devices	Access to upstream incentives	Growth in EE adoption rate
Payment on a single bill	Aggregate DER	Positive customer interaction point

Customer Segmentation and Demographics

The demonstration project for Clifton Park will primarily target the approximately 15,000 residential customers, which includes National Grid electric and gas customers and electric-only customers. In addition, approximately 1,000 small commercial customers will be eligible to participate in the project.

According to the 2010 US Census, the Clifton Park community has a population of 36,705 and is upper-to-middle class (Median Income: $80,908). Clifton Park is 91.0% White, 1.9% Black or African American, 4.6% Asian, 0.1% Native American, and 1.7% multi-racial. There are 14,102 households, 10,311 of which are family households, and these represent 82.1% of the housing units.[70]

[66] Iyengar, Sheena S., Wei Jiang, and Gur Huberman. 2003. "How Much Choice Is Too Much? Determinants of Individual Contributions in 401(k) Retirement Plans." Working paper presented at the Wharton Pension Research Council. April 2003. Retrieved at http://system.nevada.edu/Nshe/?LinkServID=3F1030DA-E201-CE84-D4690C6A61458841

[67] See Appendix. Iyengar, Sheena S. and Mark R. Lepper, "When Choice is Demotivating: Can One Desire Too Much of a Good Thing?" *Journal of Personality and Social Psychology*, 2000, Vol. 79, No. 6, 995-1006. Retrieved at https://faculty.washington.edu/jdb/345/345%20Articles/Iyengar%20%26%20Lepper%20%282000%29.pdf

[68] Accenture, "The New Energy Consumer Architecting for the Future, 2014.

[69] OPower, "Five Universal Truths About Energy Consumers," 2013, pg. 7-8.

[70] http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

Customer Analysis and Analytics

In order to both understand the potential for program adoption and effectively target program participants for the range of solutions offered in the demonstration project, it is necessary to determine the likelihood of each of the approximately 15,000 residential customers and the approximate 1,000 small commercial and industrial customers to adopt any one or more of the solutions offered. This will entail a comprehensive analysis of each customer in the study and will begin with creating an initial estimate of the hourly energy usage profile for each individual potential participant for both electricity and natural gas. These hourly energy usage profiles will be created by mapping each customer's profile (defined by a wide range of demographic, psychographic, structure, economic, etc. attributes specific to each customer) to a database of customer profiles with corresponding typical hourly energy usage profiles. These energy usage profiles will be further decomposed into specific end uses and the level of energy usage and time and length of usage for each end use. Once the mapping is established for each customer, the hourly energy usage profile and corresponding decompositions will be calibrated to each customer's monthly usage. With the hourly energy usage profiles specific to each customer established, the likelihood that any one customer will adopt any specific program solution will be determined.

The program solutions of the study can be grouped into three principal categories: EE Measures, Active Demand Response (Home Devices, Smart Home Appliances, Load Control Devices, etc.) and Rooftop-Solar PV and it is with respect to these three categories that the likelihoods of each customer adopting the corresponding solution will be determined. The likelihood that any one customer would adopt any of the specific EE Measures and/or the specific Active Demand Response solutions offered in the program will be determined by combining an analysis of the customer's decomposed hourly energy usage profile with survey data and the potential impact of the solution on the customer's energy usage and cost. Given the dependency of Rooftop-Solar PV on structural attributes of a customer's home, the determination of the likelihood of each customer's adoption of Rooftop-Solar PV is much more extensive and will be made up of viability analysis, feeder impact analysis, financial analysis and likelihood to adopt analysis.

Once the likelihoods are defined for each customer, for each category of solution and combination of solutions, the probability distributions of the total potential energy saved and total cost saved (given the existing base plan costs for each customer) can be defined. This will define the likelihood of achieving defined total energy savings and total cost savings targets, given the initial base plan levels. This model will also afford the Company and its partners the opportunity to investigate the likelihood of achieving other defined energy and cost savings targets as base plan costs were changed for each customer. A change in the base plan cost will change the likelihood (more likely in the case of an increase) of a customer adopting a specific solution.

In addition the analyses described above concerning the determination of customer likelihood of solution adoption, there will be on-going analyses performed throughout the study that will be comprised of both **Monthly & Daily Analyses.** These analyses will have a focus on providing feedback to participating customers regarding their projected energy usage and cost for the remainder of each month relative to their base plan as well as provide information to system

integrator(s) necessary to drive the active Demand Response solutions.

The **Monthly Analyses** will entail the creation of monthly forecasts of each participating customer's cost relative to their base plan cost along with a likelihood of exceeding their base plan cost without any change in behavior or intervention. Additionally, scenarios specific to participating customers regarding behavior changes and/or interventions with respect to their base plan in response to possible weather and activity scenarios will be produced and communicated to customers so as to demonstrate the potential impact of adopting specific solutions.

The **Daily Analyses** will entail the creation of day-ahead daily/hourly forecasts of load for each feeder in the demo as well as the creation of day-ahead daily/hourly forecasts for each participating customer's energy usage. These forecasts will be derived from highly accurate, self-adaptive models of hourly energy usage constructed for each participating customer and will be used in driving active-DR interventions directed by system integrator(s).

Channels

During the development of the demonstration project for Clifton Park, Company representatives met with multiple stakeholders in Clifton Park and its surrounding area to solicit their reaction and feedback towards this program. Below is a summary of the meetings that were held:

Clifton Park Residents

The Clifton Park Demonstration Project was presented to Clifton Park residents in three separate meetings at the Clifton Park YMCA in June 2015. At these meetings, residents heard about the demonstration project and then participated in an open, question and answer discussion. Their feedback was then incorporated in to the Program. Many of the attendees welcomed the Project and the concept of the levelized bills but were looking for more details than the Company was prepared to discuss at that time.

Clifton Park Town Officials

The Company met with Clifton Park's town supervisor, the chairperson of Clifton Park Government Re-Thinking Energy & Environment Now, council members, department heads and board members to discuss with them the Project and its benefits to the town and its residents and businesses. The town offered very positive feedback and welcomed the innovative Program for Clifton Park residents and businesses.

Chamber of Southern Saratoga County

The Company met with the President and CEO of the Chamber of Southern Saratoga County to describe the demonstration project and solicit ideas on how the Chamber members can partner with the Company on delivering the project. The meeting resulted in a good discussion and generated ideas for possible partnerships especially in the installation of PV systems and energy audits.

Local Universities

Company had productive meetings with faculty and staff members of the Colleges of Nanoscale Science and Engineering at the State University of New York in Albany and with faculty and staff members of the Center for Future Energy Systems at Rensselaer Polytechnic Institute. The three areas that seemed to be of most interest to the universities and to National Grid are: 1) understanding the influence of information and data on customer behavior; 2) the technical thrust of the demonstration project, namely demand response and voltage optimization, and 3) data analysis and analytics to assess the success of the program.

ESCO

The Company also met with a consultant to the Municipal Electric and Gas Alliance, an energy supply firm, and discussed with the consultant opportunities for collaboration on the Clifton Park demonstration project.

Communication, Sales, Promotion

National Grid will continue to work in collaboration with its partners to develop and implement a marketing and communication plan in order to engage customers and stakeholders. Stakeholders may include elected and appointed officials, community groups and leaders, the local Chamber of Commerce, and local universities and research institutes. In general, the marketing and communication plan will complement existing energy efficiency programs and outreach efforts.

The demonstration project will require an extensive customer education outreach effort aimed at increasing customer engagement and raising awareness about DER options that are available to customers. The Company and the Company's affiliates -- through deployment of energy efficiency programs in upstate and downstate New York as well as studying Smart Grid deployments including in Worcester, Massachusetts -- have learned that engaged customers can better understand the benefits of their direct involvement and ultimately will better manage their energy utilization.

The Company's communications will first focus on educating customers on DER which in turn will generate awareness within the community. The Company has also learned the importance of educating customers on why they have been chosen to be included in this program and the benefits it will seek to demonstrate.

Communications will focus on how DER can contribute to a "better" lifestyle with the goal of all messaging being to enlighten customers how DER can increase comfort, billing stability, home value, and health. The Company proposes engaging with Clifton Park residents using:

- Educational letters (both mailed and emailed) to first raise awareness, then to take the customer through the customer journey
- A social media campaign
- A "Customer Experience Center" that creates an environment to raise awareness and

continually educate customers and demonstrate DER and the benefits it provides. The Center will be an area destination for the community to experience interactive exhibits and education on energy technology, local sustainability efforts, and provide hands-on access to the Smart Grid technology offered by the demonstration project.

- The Company's Jurisdiction team will help facilitate conversations with community stakeholders such as elected officials and community groups.

The Company is also planning to increase awareness and education through a website, established events occurring in Upstate New York over the course of the summer, and ongoing publicly-accessible webinars.

Scalability

National Grid believes this demonstration project is highly scalable to similar communities in National Grid Service territory not only in the number of participants but also in the number of partners and vendors that can be involved.

For the partners and vendors, all partners that are able to provide clean energy solutions that enable customer choice and convenience should be able to participate, so long as they agree to the financing terms. These partners should include, but not be limited to appliance manufacturers, smart thermostat makers, solar energy providers, home retrofit installers, and customer outreach providers.

Demonstration Plan

Metrics for Success

Metrics	Customer	Partner	National Grid
DER Installations	• DER Adoption rates • Measure costs and paybacks	Magnitude of business growth; impact on customer acquisition and business risk	• Demand Response participation
Acceptance	• Number opting out	• Number of partners added	• Customer Satisfaction
Economic	• DER Savings • Behavior Savings	• Revenue Growth • Job Growth • Economic impacts	• Revenue Generated (e.g. DR, customer acquisition fees) • Meter and System Upgrade Costs
System			• Meters Installed • Savings from voltage and reactive power optimization • Deferred Load Growth • Avoided infrastructure investments
Customer Experience	• Levelized bill • Real Time Information/Alerts		

Timelines, Milestones, and Data Collection

National Grid expects to implement the portfolio of DER offerings through a phased approach so that residents see immediate offerings (e.g., thermostats, and LED light bulbs) while other offerings are rolled out over a longer timeframe. The Company has also started conversations both internally and with external solution providers regarding redesigning customers' bills. The Company anticipates providing customers with a simpler bill that includes a summary of costs, value-added recommendations (e.g., energy efficiency opportunities, smart appliance offerings, information on solar PV), while remaining compliant with regulatory requirements for bill format and content.

Participation

Target Population, Sample Size, Control Group

(Intentionally omitted)

Third-Party Partners

As the needs of customers and stakeholders evolve and new technologies are introduced, National Grid's business model must adapt to meet changing needs, as well as environmental and financial challenges. The breadth of services customers expect from their energy providers has expanded, requiring better customer insights and greater ability to educate customers about their energy usage. Achieving customer satisfaction goals requires National Grid to be seen as a trusted advisor in new technologies. In addition, new revenue models are critical for delivering the services that customers expect and to provide partners' access to customers to further animate markets and deliver new products. In order to meet these needs by delivering innovative customer solutions and in light of resource constraints, partnering with a variety of entities is a desirable approach when a mutual value proposition can be found that is broader than the purchase of goods and services and will enhance customer satisfaction.

Partnering strategy is critical to the success of National Grid's customer programs and is formally coordinated by the Company's Alliance and Vendor Strategy department. The Company was recently recognized for excellence in partnership management by the Association of Strategic Alliance Professionals as winner of their Individual Alliance Excellence Award with Earth Networks-WeatherBug®. National Grid believes that this demonstration project offers the opportunity to build on existing partner relationships while developing new alliances to better serve shared customers.

Based on the expected value that their respective product offerings could deliver to customers, their respective proposed business models, and willingness to engage with other partners, the following vendors were selected as partners for the Clifton Park Demonstration Project:

Sealed, Inc. is a New York-based start-up company that guarantees energy bill savings to customers who pursue home efficiency improvements. Sealed is the first and only company that provides the customer with a contractual energy savings guarantee. Sealed with provide this service for customers that opt up to a Plan over and above the Base Energy Plan.

OPower is one of the leading energy companies that combines a cloud-based platform, big data, and behavioral science to help utilities around the world reduce their customers' energy consumption and improve their relationships with their customers. This helps consumers lower their energy use and costs, and significantly reduces carbon emissions. Opower is transforming the way the world approaches household energy conservation.

Earth Networks is a Maryland-based weather company. They manage one of the largest sensor networks monitoring weather, lightning and greenhouse gases in the world." Big data" from their networks makes it possible for consumers, enterprises and governments to "know before" with Early Warning Systems that provide the most detailed information and the fastest alerts to severe

weather when minutes matter. They also offer home energy management and demand response programs through WeatherBug Home that integrate their weather data. Their weather app includes features that allow customers to better understand the energy usage of their homes.

Honeywell invents and manufactures technologies to address some of the world's toughest challenges initiated by revolutionary macro-trends in science, technology and society. A Fortune 100 company, Honeywell creates solutions to improve the quality of life of people around the globe: generating clean, healthy energy – and using it more efficiently. Honeywell manufactures communicating programmable thermostats and offers direct installation of a variety of energy efficiency measures.

Itron is a world-leading technology and services company dedicated to the resourceful use of energy and water. Itron provides comprehensive solutions that measure, manage and analyze energy and water. Their broad product portfolio includes electricity, gas, water and thermal energy measurement devices and control technology, communications systems, and software, as well as managed and consulting services.

Utilidata is a global software company committed to modernizing the electric grid. Their innovative technologies capture unprecedented, real-time electric grid intelligence that enables utilities to make smarter decisions—increasing efficiency and reliability, integrating distributed energy resources, and protecting the grid.

Silver Spring Networks With more than ten years of experience, Silver Spring Networks is a leader in networking technologies that modernize today's power grid. Silver Spring securely connects consumers and utility providers through powerful and proven energy networks that can be easily expanded as needs evolve. Silver Spring Networks provides networked LED streetlights and controls.

Partner list for the Demonstration Project

Partner	Role	Revenue Model
Sealed Inc.	Bill presentment Savings guarantee Customer engagement	Shared Savings
OPower	Analytics Bill presentment Behavioral norming Alerts and notifications Data presentment	Marketing revenues
Earth Networks	Demand Response AggregatorHome Diagnostic Analytics Provider Mobile App Provider	Shared Savings from DR and EE
Itron	Metering platform	
Water Heater Manufacturer	Water Heaters	Appliance Leasing
Appliance Manufacturer	Appliances	Appliance Leasing
Honeywell	Thermostats Direct Install Provider Marketing	Appliance Leasing Shared Savings
Silver Spring Networks	Networked LED Streetlights and Controls	Connection Fee from Third Parties

Utility Resources and Capabilities

To support this demonstration project, the Company expects to utilize utility staffing from groups throughout the Company including, but not limited to, Regulatory, Rates, Billing, Customer Service, and Customer.

Community Outreach / Community Engagement

Outreach to Affected Communities

(Intentionally Omitted)

Motivating Customers / Communities

(Intentionally Omitted)

Conditions / Barriers

Market rules and standards

National Grid will petition the Commission for specific approval to proceed with the following two elements of this demonstration project:

i.) The opt-out approach as proposed for eligible customers in Clifton Park to participate in this demonstration project will result in certain customer data being released to participating project partners without the advance, express permission of the customer. This is in conflict with the Commission's guidelines regarding customer confidentiality where express customer consent is to be obtained before releasing confidential customer data as first established in the Uniform Business Practices proceeding. National Grid will seek a limited waiver from the Commission to proceed with this demonstration project on an opt-out basis whereby confidential customer data can be shared with project partners absent a customer affirmatively opting in to participation.

ii.) The proposed role of Sealed Inc. in this demonstration project will remove National Grid from a direct billing relationship with its customers as Sealed will be direct billing participating customers as described earlier. Under Public Service Law Section 44 (1), utilities are required to assure that bills for service to residential customers adequately explain the charge for service in a clear and understandable form and language and this is not a delegable responsibility today with the exception of the billing of commodity service by ESCOs who are bound by the Uniform Business Practices and the consumer protections embodied in the Home Energy Fair Practices Act and incorporated in the Uniform Business Practices. Sealed is not an ESCO and is effectively a DER provider in the context of this demonstration project. Moreover, Sealed will be effectively performing consolidated DER provider billing and there are currently no rules that adhere to DER providers in any billing capacity. As such, National Grid will be seeking permission from the Commission for Sealed to be treated as an ESCO provider for the limited purposes of this demonstration project.

Consumer Protections

Residential customers are protected under the Home Energy Fair Practices Act ("HEFPA") which includes special provisions that prohibit utilities from disconnecting service to such customers for non-payment, the requirement to offer deferred payment agreements to customers in arrears, and a stipulated late payment charge amount, among numerous other provisions. All residential customers participating in this demonstration project must be afforded all the protections of HEFPA.

Channel or Market Challenges

The primary market barrier for the Clifton Park demonstration project site has been partner uncertainty around new revenue models. The team has developed several strong partner relationships to deliver the proposed services, however many companies are still unsure about the prospect of providing hardware or investment up front to be paid back by customers on the bill. The pay through the savings model is yet untested and companies view this as a high-risk alternative to successful current business strategies. The Clifton Park demonstration project will provide a powerful signal to future partners as to whether payment through savings program can be applied across residential customers in a way that is profitable to both the Company and its partners.

This demonstration project involves numerous partners, some of which offer similar solutions. While this could impede information exchanges and partnering, the Company has emphasized to these partners that the customer experience must be seamless and efficient for customers. Meetings between the Company and the partners in May and June addressed this channel barrier and minimized redundancies in partner roles for the benefit of the customer. Smooth integration between partners and vendors will require close management throughout the demonstration project.

While the program is primarily focused on owner occupied properties, the Company will attempt to include renters and landlords to participate in the demonstration project program and benefit from its offerings. In a later phase the Company may look to modify the program offerings to better align with renters and landlords.

Financial Elements / Revenue Model

New Utility Revenue Streams

The demonstration project revenue model estimates the number of enrollees in each of the four Energy Plans, each customer's savings and device costs, and the revenue streams for each of the partners and vendors.

The revenue streams for the demonstration project include:

- Behavior Change Savings
- Thermostat Energy Savings
- LED Light bulbs/Water Heater/Appliance Savings
- Solar Installation Savings
- Weatherization Savings
- Adders for each bundled plan
- Savings from voltage and reactive power optimization ("VVO") Savings
- Demand Response Funds

By default, each customer will be enrolled in the Base Energy Plan and will be offered the opportunity to enroll in an 'opt-up' bundle to Silver, Gold, or Platinum, or opt-out of the program altogether. After each customer contract ends, the majority of the savings will be realized by the customers in the form of a reduced levelized bill. A portion of the savings will be retained and applied towards program operations and maintenance expenses.

Based on numerous studies of consumer behavior, the Company assumes that 15% of the Clifton Park customers will not participate ("opt-out") of the program, which is typical of energy programs. In each of the four Energy Plans, the Company's financial model assumes the following enrollment and adders:

Bundle	Enrollment Percentage
Base	63%
Silver	16%
Gold	5.5%
Platinum	0.5%
Opt-Out	15%

The following savings assumptions are used to calculate the customer energy savings in addition to the revenues generated for the demonstration project. All energy savings are calculated based upon average customer account usages and bills in Clifton Park, NY over 2013 - 2014.

- Customer Behavior Change Savings: 1.5%
- Thermostat Savings: 4.8 – 6.0% Gas Savings
- Thermostat Savings: 1.5 – 2.5% Electricity Savings
- Lighting Savings: 1.5 – 3.0% Electricity Savings
- Electric Water Heater Savings: 10% Electricity Savings
- Energy-Efficient Appliance: 2% Electric Savings
- Weatherization Savings: 10% Gas Savings
- Weatherization Savings: 3% Electric Savings

Revenue Streams	Year 1	Year 2	Year 3
Base Energy Plan	$141,999	$283,997	$283,997
Silver Energy Plan	$121,994	$243,988	$243,988
Gold Energy Plan	$385,713	$771,425	$771,425
Platinum Energy Plan	$132,545	$265,089	$265,089
VVO Revenue	-	$263,309	$526,617
Demand Response Revenue	-	$62,910	$62,910

The following cost assumptions are used to calculate Program costs. These costs are estimates and may differ from actual program costs:

- Thermostat Cost: $250 (plus 5% financing over 2 years)
- Thermostat Installation Cost; $150
- Energy Audit Cost: $250
- LED unit Cost: $15
- Water heater Cost: $1,000 (plus 5% financing over 3 years)
- Energy Efficient Appliance Cost: $2,200 (plus 5% financing over 3 years)
- Energy Efficient Appliance Installation Cost: $200
- Weatherization Cost: $4,500 (plus 5% financing over 10 years)

	Year 1	Year 2	Year 3
CapEx Costs	$2,479,783	$3,972,683	$1,600,000
Partner Costs	$1,443,824	$3,133,099	$2,200,424
Silver Bundle Costs	$720,015	$1,026,954	$343,007
Gold Bundle Costs	$553,409	$932,018	$603,729
Platinum Bundle Costs	$115,575	$221,275	$185,676
Company Costs	$2,329,427	$1,752,683	$966,785
Operations & Maintenance	$246,086	$398,965	$398,965

The Company believes that this demonstration project, when scaled, will be profitable since the vast majority of partner costs are fixed costs and will not drastically increase with increased enrollment.

Investments and Returns

1. DR values for the residential and commercial customers
2. Leveraging of energy efficiency funding
3. Data and analytics
4. New opportunities for customers to manage their spending
5. Product and services that appeal to targeted groups
6. Leveraging DER and DG to achieve system level efficiency and reliability
7. Wider and deeper implementation of DER and DG
8. Stacking/maximizing the benefits of DER, DG, storage, and data
9. New business model that is focused on low customer acquisition costs

Returns & Cost Effectiveness

(Intentionally Omitted)

Reporting

Information to be Included in Quarterly Reports to the Commission

Quarterly progress reports on the stakeholder and business model work will be provided to the Department of Public Service ("DPS") Staff. These reports will include at a minimum an overview of project progress against timeline/plan and results as they become available. Additionally, in order to maintain flexibility and maximize the potential for innovation and learning the reports may contain other updates or deviations from the initial details provided in this filing. To further ensure alignment, the Company would also like to meet with DPS Staff to discuss the quarterly progress reports. Any changes related to costs shall remain within the overall revenue requirement cap. Furthermore, as highlighted in the DPS letter dated June 24, 2015,[71] should a situation or activity arise that is not authorized by the Commission the Company

[71] Tammy Mitchell and Marco Padula, "Letter to Utility REV Demonstration Project Representatives," Department of Public Service, via email, June 24, 2015.

would include a description in the quarterly report and request such authorization through a petition to the Commission. Lastly, the Company looks forward to continued collaboration with DPS beyond the formal quarterly reports.

Conclusion

Post-Demonstration Qualitative and Quantitative Benefits

There are numerous post-demonstration benefits that will be realized by customers, the Company and our partners. Customers will have choices on how they meet their individual energy needs. They can choose an energy plan that provides them with the technology they desire and the level of usage that is appropriate for their home and lifestyle, all packaged in one simplified bill. They can make that choice in a more educated manner because they will have the information necessary to understand their energy usage and understand the benefits that technology can afford them in managing that usage. As customers become more knowledgeable and comfortable with energy choices, they will begin to demand additional services and products. The establishment of partnerships in this demonstration project will facilitate the new product development that will be essential to meet the more sophisticated future needs of our customers.

The new information channels that will be established in the demonstration project between customers, our partners and the Company will give customers the knowledge to more actively participate in energy efficiency programs. It will also give the partners and the Company the market information that will enable them to develop innovative energy efficiency offerings that the customer will utilize. This increased participation in energy efficiency programs benefits society as a whole by reducing greenhouse gases and providing customers with health and well-being benefits. Individual customer participation in energy efficiency programs allows customers to reduce their energy usage and costs and gives them ownership of care for the environment.

The demonstration project will employ infrastructure investments including advanced grid devices that will increase system efficiency long after the demonstration project is complete. It will assist the Company in outage knowledge and control by quickly identifying accomplished fairly easily given the partners all have national or regional footprints.

Plans to Scale

Clifton Park is a community with medium-to-high income demographics. Scaling up to other communities with similar demographics could be accomplished fairly easily given the partnerships developed through this demonstration project. The model will need to be tested with a community, from a demographics perspective, in a lower income bracket to determine if customer participation drivers are different.

Cost Recovery and Incentives

Niagara Mohawk Power Corporation d/b/a National Grid

July 1, 2015

Cost Recovery

The Commission's Order Adopting Regulatory Policy Framework and Implementation Plan issued on February 26, 2015 states that "[u]tilities will be permitted to defer the revenue requirement impacts of the incremental costs of demonstration projects until their next rate plan. Mechanisms other than deferral may be proposed, in consultation with Department of Public Service Staff. Proposals may include recovery within existing net plant reconciliation mechanisms, or surcharges. Ratepayer support for all demonstration projects of a utility, including those authorized in rate plans, will not exceed 0.5 percent of its delivery service revenue requirement or the revenue requirement associated with capital expenditures of $10 million, whichever is greater, unless a higher amount is specifically approved by the Commission.[72]"

The Company believes that concurrent recovery of incremental costs of demonstration projects and corresponding incentives is the appropriate means for the ongoing funding of REV demonstration projects. Concurrent recovery aligns with the Commission's precedent for recovery of costs incurred by the Company in a future test year. This precedent recognizes the importance of matching revenue flow with the cash flow obligations for the Company. Given the importance of the REV demonstration projects, it is necessary for the Commission to approve a recovery mechanism that allows alignment of cost recovery with incurrence.

The recovery components will be calculated based on the revenue requirement associated with any costs expended on the REV demonstration projects and earned incentives. The revenue requirement will be calculated using approved values from the Company's last rate case, as appropriate. The Company will propose in its next proceeding where rates are being considered, the recovery of the initial REV demonstration costs by offsetting other amounts owed to customers and/or a concurrent cost recovery mechanism.

Incentives

Positive incentives are warranted for the demonstration projects. The demonstration projects are innovative and will deliver lessons necessary to ascertain the road to success for REV. The Company's demonstration project proposals reflect a commitment to moving the goals of REV forward and learning from the demonstration projects to do so. Given the innovative elements of these proposals, the demonstration projects will require the Company to stretch outside its normal business operational mode to resolve issues of implementation and adapt to learnings as they happen. Learning from the projects themselves is a success story even if the lessons teach us that the approach is not correct. Thus, all demonstration projects provide value for customers either by demonstrating new ways to serve customers or demonstrating inability of an approach to provide customer benefit.

[72] Case 14-M-0101 – *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* ("REV proceeding"), Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015), at p. 116.

As has Consolidated Edison Company of New York, Inc. ("Con Edison"), National Grid proposes up to a 150 basis point adder for an incentive on each of its demonstration projects[73]. Approval of this incentive would signal the Commission's commitment to innovation and positively promote utilities' pursuit of demonstration projects for the opportunities they present for customers while rewarding shareholders for the allocation of capital funding and other resources in this direction. As Con Edison stated in its petition seeking Commission approval of the Brooklyn/Queens Demand Management Program, the additional incentive serves to enhance the Company's focus and effort to make these non-traditional methods effective for customers[74].

The Company continues to investigate other means of incentive compensation based upon successful implementation of the goals in each demonstration project. Whereas the 150 basis point incentive is a reward for performing the demonstration projects, any additional incentive structure would be valued based upon results from each project. At the time of this filing, the Company has not completed its evaluation of this type of incentive but will file a proposal for the Commission's approval when completed.

[73] Case 15-E-0229 – *Petition of Consolidated Edison Company of New York, Inc. for Implementation of Projects and Programs That Support Reforming the Energy Vision* (April 10, 2015), at pp. 8-9.
[74] Case 14-E-0302 – *Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn/Queens Demand Management Program* (July 15, 2014), at p. 21.

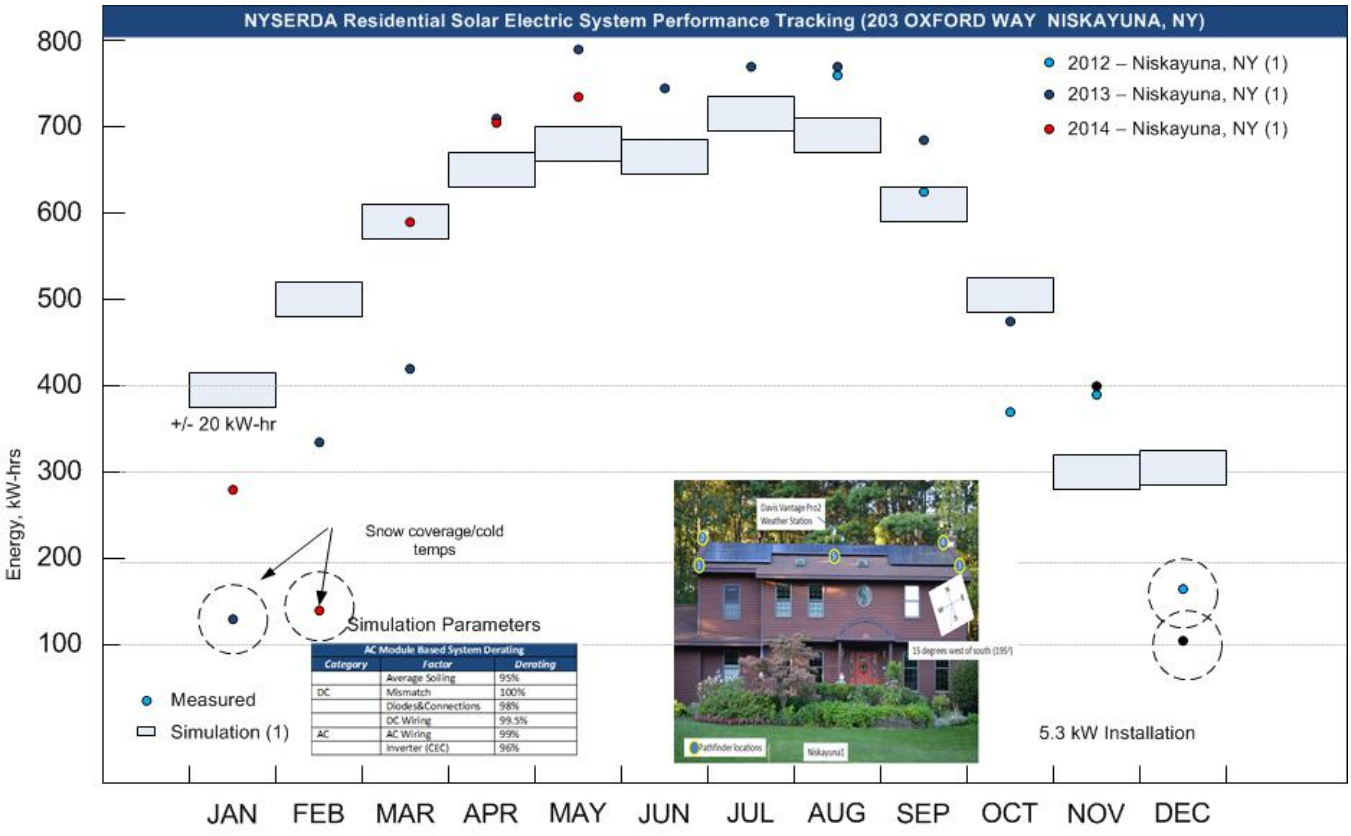
Appendices

Niagara Mohawk Power Corporation d/b/a National Grid

July 1, 2015

Appendix A: BNMC Fruit Belt

Solar Electric Performance Tracking for
GE's 5 kW Micro-Inverter System



(1) Simulation: PVSys 6.01

	PVSyst Simulation	
	LOW	HIGH
Jan	378	418
Feb	480	520
Mar	570	628
Apr	632	668
May	661	700
Jun	643	684
Jul	696	738
Aug	675	710
Sep	595	630
Oct	486	524
Nov	282	318
Dec	288	324
TOTAL	6386	6862

	Actuals		
	2012	2013	2014
Jan	0	135	281
Feb	0	328	146
Mar	0	417	587
Apr	0	707	706
May	0	787	736
Jun	0	745	0
Jul	0	771	0
Aug	775	776	0
Sep	623	685	0
Oct	350	466	0
Nov	388	399	0
Dec	170	106	0
TOTAL		6322	

American Douglas Metals, Inc. A family-owned company, American Douglas Metals, Inc. is a premier manufacturer and processor of aluminum and steel products with three locations in Orlando, FL, Buffalo, NY, and Atlanta, GA. Established in Buffalo by two Western New York Families in 1976, the Company manufactures and designs products utilizing aluminum extrusions and carbon steel for a diverse customer base ranging from local manufactures to Fortune 500 Multinational Corporations. The Buffalo operation has grown from three employees in a leased office space to 32 employees working in company- owned, state of the art manufacturing facility. In the past 15 Months, American Douglas has hired 6 new full-time employees and invested over $3,000,000 into the renovation of the facility. For the purposes of the demonstration, American Douglas Metals, Inc. will manufacture and assemble the solar installation kits for the demonstration at their Buffalo facility.

Buffalo Niagara Medical Campus, Inc. The Buffalo Niagara Medical Campus, Inc. (BNMC Inc.) is a self-sustaining social enterprise successfully combining innovation, job creation, and urban revitalization. The BNMC Inc. serves as the umbrella organization of the anchor institutions that make up the Buffalo Niagara Medical Campus located within a 120-acre campus bordering the Allentown and Fruit Belt neighborhoods of downtown Buffalo. The organization fosters conversation and collaboration among its member institutions, its partners and the community to address critical issues impacting them including energy, entrepreneurship, access / transportation, workforce and procurement, neighborhoods, and healthy communities.

City University of New York (CUNY). Since 2007 Sustainable CUNY has led the implementation of multiple U.S. Department of Energy (DOE) solar initiatives, working with the Office of the Mayor of New York City, NYC Economic Development Corporation, Con Edison, NYSERDA, NYPA and over 30 partners to strategically remove barriers to large scale solar deployment.

Erie County Community College (ECC). Erie Community College has been recognized as a western New York leader in career-focused education and workforce development. The recently opened Green Building Technology Center provides the college with a unique opportunity to train individuals. The 1,700-square-foot training center will be utilized for training in renewable energy and energy efficiency; enhanced, non-credit workforce development pertaining to Western New York's emerging green building technology field.

General Electric Global Research Center (GRC) – Niskayuna, NY. With research concentrations in Manufacturing & Materials Technology, Aero-Thermal Mechanical Systems, Chemistry and Chemical Engineering, Diagnostics & Biomedical Technologies, Electrical Technologies and Systems, Software Sciences and Analytics, and Advanced Technologies, General Electric's GRC the nerve center for innovative work across technologies and collaboration across GE's businesses.

SPARQ Systems, Inc. SPARQ Systems Inc. is the Canadian leader in developing advanced photovoltaic (PV) microinverter products and systems. SPARQ has designed the next generation of smart grid enabled photovoltaic micro-inverter technology, enabling access to the rapidly growing distributed solar market. SPARQ's software-based approach seeks to maximize energy harvesting, while making it compatible with both existing power distribution networks and future smart grid applications.

State University of New York at Buffalo (UB). With more than 100 undergraduate degrees, 205 master's degrees and 94 doctoral and professional degrees. UB has the widest range of academic programs of any public institution in New York or New England. Specifically, staff and students of the School of Engineering and Applied Sciences will participate to leverage the learning opportunity that the demonstration provides.

Appendix C: BNMC Fruit Belt

Letters of Support from Partners

July 1, 2015

Buffalo Niagara Medical Campus, Inc.

GE Global Research

American Douglas Metals

Sparq

Fruit Belt Advisory Council

Orchard Community Initiative

October 15, 2014

Re: *Community Solar Initiative Project Proposal*

On behalf of the Buffalo Niagara Medical Campus, Inc., which represents 9 member institutions and close to 70 public and private companies, we are pleased to lead the proposed *Community Solar Project Initiative* in support of our *5-Year Energy Innovation Plan* and our larger *energizeBNMC* Partnership with National Grid.

The proposed Project supports four key Opportunity Areas identified in the BNMC's *Energy Innovation Plan* for the Campus proper and its surrounding communities: cost-cutting energy efficiency, fostering local economic growth, creation of a Community Learning Hub, and pioneering innovations in health and energy. Through directly engaging and benefiting the residents of the City of Buffalo's Fruit Belt neighborhood, we feel this project would strengthen our over-arching *Four Neighborhoods, One Community* vision through increasing the Community's adoption of energy efficiency in an innovative and sustainable way and creating lasting workforce development benefits for the larger Buffalo-Niagara region.

We are excited for the opportunity to lead this first-of-its-kind project in support of the Fruit Belt Neighborhood and the wider Buffalo-Niagara region.

Sincerely,

Matthew Enstice, CEO
Buffalo Niagara Medical Campus, Inc.

nationalgrid

HERE WITH YOU. HERE FOR YOU.

October 14, 2014

Mr. Matthew Enstice, Chief Executive Officer
Buffalo Niagara Medical Campus, Inc.
640 Ellicott Street
Buffalo, NY 14203

Re: Letter of Support for the Buffalo Niagara Medical Campus Inc.'s *Community Solar Project Proposal*

Dear Matt:

On behalf of National Grid USA, we are pleased to express our on-going support of the Buffalo Niagara Medical Campus, Inc.'s *Community Solar Project Initiative* and our larger *energizeBNMC* partnership, as envisioned in the BNMC's *5-Year Energy Innovation Plan*. The proposed Project supports four key Opportunity Areas identified in the *Plan* for the Campus proper and its surrounding communities: cost-cutting energy efficiency, fostering local economic growth, creation of a Community Learning Hub, and pioneering innovations in health and energy. Through directly engaging and benefiting the residents of the City of Buffalo's Fruit Belt neighborhood, we feel this project would help to increase the Community's adoption of energy efficiency in an innovative and sustainable way, bring about lasting workforce development benefits for the larger Buffalo-Niagara region, and result in valuable insights as to how such a model can contribute to the resiliency and efficiency of the electric grid.

We are excited for the opportunity to co-lead this project with BNMC, Inc. in support of the Fruit Belt Neighborhood and the wider Buffalo-Niagara region. Thank you for your continued effort and leadership in these exciting times.

Sincerely,

Edward White, Vice President, Customer Strategy and Environmental
National Grid USA

GE
Global Research
One Research Circle
Niskayuna, NY 12309
United States

June 25th, 2015
Mr. Matthew Enstice
Chief Executive Officer
Buffalo Niagara Medical Campus, Inc.
640 Ellicott Street
Buffalo, NY 14203

Subject: Letter of support for Residential PV effort at Buffalo Niagara Medical Campus.

GE Global Research (GE-GR) is pleased to offer this letter of support for the Buffalo Niagara Medical Campus (BNMC) and National Grid in their joint effort for the installation of residential PV in the City of Buffalo's Fruit Belt neighborhood. GE-GR is prepared to support this effort as defined in the attached statement of work, with a Rough Order of Magnitude (ROM) estimate in the amount of $300,000 for the effort. For the avoidance of doubt, GE will not have any responsibility or obligation for the PV installation. This ROM is for discussion only, and is not to be used as a Not-to-Exceed (NTE) budget nor does it bind GE-GR contractually. GE-GR will be pleased to submit a formal proposal upon receipt of a formal Request for Quotation or Request for Proposal. To receive a formal quotation from GE-GR, please send a Request For Quotation referencing this ROM to: Jeff Popielarczyk, Business Development Manager, (popielar@ge.com) (518) 387-6908.

GE-GR views this project as an opportunity to increase customer engagement and model utility ownership of distributed energy resources, as envisioned in the REV proposal. The BNMC is a strong partner for demonstrating new technologies and models for utility ownership of DERs and customer engagement. As distributed PV installations become more widespread, analyzing the role of these installations in providing grid services and developing the controls to integrate them with existing infrastructure is an important objective that this demonstration will support.

GE is maintaining and contributing to the technology and intellectual property portfolio of the proposed project. This portfolio is currently over ten patents and applications. This represents tens of thousands of dollars annually invested to grow and maintain the portfolio. GE has invested over $500k to date on the fundamental micro-inverter technology committed to the proposed project. GE is engaged in the development of the commercial micro-inverter design that will be fielded during the program. This effort is estimated to be in excess of $75k.

GE-GR is excited for this opportunity to be a partner on this project in support of the Fruit Belt Neighborhood and the wider Buffalo-Niagara region.

Jeff Popielarczyk
Business Development Manager

GE
Global Research
One Research Circle
Niskayuna, NY 12309
United States

T 518-387-7357
F 518-387-5449

October 14, 2014

Mr. Matthew Enstice
Chief Executive Officer
Buffalo Niagara Medical Campus, Inc.
640 Ellicott Street
Buffalo, NY 14203

Subject: Letter of support for Residential PV effort at Buffalo Niagara Medical Campus.

GE Global Research (GE-GR) is pleased to offer this letter of support for the Buffalo Niagara Medical Campus (BNMC) and National Grid in their joint effort for the installation of residential PV in the City of Buffalo's Fruit Belt neighborhood. GE Global Research is prepared to support this effort as defined in the attached statement of work, with a Rough Order of Magnitude (ROM) estimate in the amount of $300,000 for the effort. GE may have additional scope for the program with other organizations in GE, including GE Ventures. For the avoidance of doubt, GE will not have any responsibility or obligation for the PV installation.

GE-GR views this project as an opportunity to increase customer engagement and model utility ownership of distributed energy resources, as envisioned in the REV straw proposal. The BNMC is a strong partner for demonstrating new technologies and models for utility ownership of distributed energy resources and customer engagement.

This ROM is for discussion only, and is not to be used as a Not-to-Exceed (NTE) budget nor does it bind GE-GR contractually. GE-GR will be pleased to submit a formal proposal upon receipt of a formal Request for Quotation or Request for Proposal.

To receive a formal quotation from GE-GR, please send a Request For Quotation referencing this ROM to: Matt Nicholls, Business Development Manager, (nicholls@ge.com) (518) 387-6107.

Kelly Fletcher
GE Energy Business Programs Manager

GE Global Research Scope of Work for BNMC Fruit Belt Solar Proposal
Demonstration of Control Platform and Use Cases

This statement of work encompasses GE Global Research scope to develop and demonstrate a control capability and use cases for residential PV, for National Grid and Buffalo Niagara Medical Campus.

Task 2 –Feeder Network Modeling: GE Global Research will perform the following sub-tasks:

Sub-Task 2.1 – Data collection post PV installation and architecture tradeoffs

This task will involve collecting data from the National Grid substation and PV microinverters. The data will be used to perform architecture tradeoffs. The architecture options will be simulated in a hardware in the loop setup in GE's RTDS (real time digital simulator) to estimate benefits and ensure robustness and reliability before other project partners deploy the system

The tradeoffs will include looking at the following architecture options:

- The default option is to set the inverters to P priority and unity power factor

-The second option would be to enable the microinverters to output VARs in response to feeder voltage variations

-The third option would be to send commands to the home hubs from the substation central control to centrally manage Volt/VAR coordination. The commands should take into account which homes have more Q capacity. The hub itself will have the intelligence to determine which microinverters have more Q capacity and dispatch accordingly

Sub-Task 2.2– Substation central control

This task will involve the development of substation level Volt/VAR control that monitors the feeder voltage profile, the Q capacity available per home from the home hubs and intelligently dispatches the Q command to each home hub taking into account the maximization of PV active power. The central control will based on GE's 'RenewablesIQ' platform.

Sub-Task 2.3 – Reverse power flow management

This task will involve the development of central substation controls that monitor the net power flow on the feeder and intelligently sends a curtailment command to each home hub depending on their P capacity. Internally within the home, the hub will also intelligently curtail the microinverters according to their P capacity to ensure maximum PV production.

Task 6 –Performance Assessment: GRC will perform the following sub-tasks:

Sub-Task 6.1 – Data collection and baseline establishment

This task will involve collecting data from the National Grid substation and any downstream data acquisition to establish the baseline feeder characteristics (losses and voltage profile)

Sub-Task 6.2 Final data collection, control refinement and analysis

Following the implementation of the final architecture and controls, data will be collected to establish the new baseline and quantify benefits

AMERICAN DOUGLAS METALS

4265 McEver Industrial Drive
Acworth, GA 30101
P // 770.529.0261
F // 770.974.9825

99 Bud Mil Drive
Buffalo, NY 14206
P // 716.877.5257
F // 716.877.3456

783 Thorpe Road
Orlando, FL 32824
P // 407.855.6590
F // 407.857.3290

www.americandouglasmetals.com

October 7, 2014

Mr. Matthew Enstice, Chief Executive Officer
Buffalo Niagara Medical Campus, Inc. (BNMC, Inc.)
640 Ellicott Street
Buffalo, NY 14203

Re: Letter of Support for the Buffalo Niagara Medical Campus Inc.'s *Community Solar Project Initiative*

Dear Mr. Enstice:

On behalf of American Douglas Metals, Inc., we are pleased to express our support of the Buffalo Niagara Medical Campus, Inc.'s *Community Solar Project Initiative* that seeks to engage and benefit the residents of the City of Buffalo's Fruit Belt neighborhood adjacent to the BNMC. Through the installation of (100) residential PV systems on a sub-set of homes, the proposed project aims to accelerate the Community's adoption of energy efficiency in an innovative way, generate workforce development benefits for the larger Buffalo-Niagara region, and to contribute to the resiliency of the electric grid.

American Douglas Metals, Inc. is a premier manufacturer and processor of aluminum and steel products that operates three manufacturing facilities in Buffalo, New York, Orlando, Florida and Atlanta, Georgia. With our headquarters and roots in Buffalo, American Douglas Metals, Inc., recognizes the critical need for revitalizing Buffalo's urban neighborhoods and sees this initiative as instrumental to that effort. As the manufacturer who would assemble and transport the installation kit that would be utilized for the project's proposed PV system, we would welcome the opportunity to directly contribute to our local community, which has been our business model since our company's inception in 1976.

We are excited for the opportunity to partner with the BNMC, Inc. and the proposal partners on this project in support of the Fruit Belt Neighborhood, and the wider Buffalo-Niagara region. If you require additional information, please do not hesitate to contact me at our Buffalo facility.

Sincerely,

Kevin Blake
General Manager
American Douglas Metals, Inc.

June 24, 2015

Edward White, VP of New Energy Solutions
National Grid
40 Sylvan Road
Waltham, MA 02451-1120

Dear Mr. White:

Sparq Systems is pleased to have the opportunity to participate in the BNMC solar project. We view this as a great way for solar to not only expand in the future but as a winning proposition for all the participants.

We are eager to be a partner in this project as we believe it will be a model that can be replicated by other utilities. We see it as not only making sense not only in the Buffalo area, but across New York State. We also believe that if it is successful as we envision, then we can see many utilities across the US would also take advantage of this idea to serve low-income communities, improve the grid, and save the ratepayer money at the same time. For Sparq, we hope by participating and learning from this project, we will be able to evolve our products to be ideal for these deployments, giving us new markets to pursue and the revenue that would come with success there.
As part of our contribution, Sparq will be doing significant semi-custom work on our Hardware and Software to make sure it is optimized for this program. This includes the AC Module configuration to allow easy and safe installation by having AC power and the solar built in a standardized way that a utility would be best able to take advantage of, to the interactive software to control grid functions like reactive power to improve local grid performance and efficiency. Enabling this would be a first of its kind in residential solar as it is not offered by the existing solar providers today. We believe this contribution will demonstrate how solar can do more than simply just coexist with the grid, but in fact improve it in a way that benefits the consumer as well as the utility, opening up new models for the future deployment of solar even in low income areas. Our estimate at this time is $2 million of HW & SW product development and an additional $1.5 Million of prototyping, testing and certification to get to a solution that will be scalable for this project and beyond. This is in addition to the $2.5M already in the budget from the sale of these products.

We sincerely appreciate your consideration. Please do not hesitate to let me know if you have any questions as you plan out the next stage of the project.

Thank you,

Mike Fister
President & CEO, Sparq Systems

October 14, 2014

Mr. Matthew Enstice, Chief Executive Officer
Buffalo Niagara Medical Campus, Inc. (BNMC, Inc.)
640 Ellicott Street
Buffalo, NY 14203

Re: Letter of Support for the Buffalo Niagara Medical Campus Inc.'s *Community Solar Project Initiative*

Dear Mr. Enstice:

On behalf of SPARQ Systems, Inc., we are pleased to support the Buffalo Niagara Medical Campus, Inc.'s proposed *Community Solar Project initiative* that seeks to engage and benefit the residents of the City of Buffalo's Fruit Belt neighborhood adjacent to the BNMC. Through the installation of (100) residential PV systems on a sub-set of homes, the proposed project aims to accelerate the Community's adoption of energy efficiency in an innovative way, generate workforce development benefits for the larger Buffalo-Niagara region, and to contribute to greater resiliency of the electric grid.

SPARQ Systems, Inc. is a recognized industry leader in the development of smart grid-enabled photovoltaic (PV) microinverter products and systems. Through our active collaboration with academia and researchers housed at Queen's University Innovation Park in Kingston, Ontario, Canada, we have developed a universal, software-based, plug and play microinverter system that utilizes power electronics topology in the place of electrolytic capacitors and optical isolators to increase overall grid efficiency and power density. We welcome the opportunity this project presents to not only further commercialize this technology but to encourage greater solar adoption among low-to-moderate income electric utility customers.

We appreciate the opportunity to partner with the BNMC, Inc. and the proposal partners on this project in support of the Fruit Belt Neighborhood, and the wider Buffalo-Niagara region. If you require additional information, please do not hesitate to contact me.

Sincerely,

Praveen Jain
Chairman and CTO
pjain@sparqsys.com

Pastor Alan R. Core
First Centennial M.B. Church
273 High Street
Buffalo, NY 14203

October 9, 2014

Matthew K. Enstice
Buffalo Niagara Medical Campus
640 Ellicott Street
Buffalo, NY 14203

Re: Letter of Support for the Buffalo Niagara Medical Campus Inc.'s *Community Solar Project Proposal*

Dear Mr. Enstice:

On behalf of Fruit Belt Advisory Council, we are pleased to share our support of the Buffalo Niagara Medical Campus, Inc.'s *Community Solar Project initiative* that seeks to engage and benefit the residents of the City of Buffalo's Fruit Belt neighborhood adjacent to the BNMC. Through the installation of (100) residential PV systems on a sub-set of homes, the proposed project aims to accelerate the Community's adoption of energy efficiency in an innovative way, generate workforce development benefits for the larger Buffalo-Niagara region, and to contribute to the resiliency of the electric grid.

The Fruit Belt Advisory Council was established in 2013 by Councilmember President Darius Pridgen. It consists of a 19 member board that is representative of churches, residential homeowners, not-for-profits, businesses, tenants, schools. These community stakeholders have come together to provide community input and advice to the Buffalo Common Council on decisions affecting the community.

We are excited for the opportunity to partner with the BNMC, Inc. and the proposal partners on this project in support of the Fruit Belt Neighborhood, and the wider Buffalo-Niagara region. If you require additional information, please do not hesitate to contact me.

Sincerely,

Pastor Alan R. Core

President

Fruit Belt Advisory Council

Orchard Community Initiative

Matthew Enstice, President
Buffalo Niagara Medical Campus
640 Ellicott Street
Buffalo, NY 14203

Re: Letter of Support for the Buffalo Niagara Medical Campus Inc.'s *Community Solar Project Proposal*

Dear Mr. Enstice:

On behalf of the Orchard Community Initiative, we would like to express our support of the Buffalo Niagara Medical Campus, Inc.'s *Community Solar Project initiative* that seeks to engage and benefit the residents of the City of Buffalo's Historic Fruit Belt neighborhood adjacent to the BNMC. Through the installation of (100) residential PV systems on a sub-set of homes, the proposed project aims to accelerate the Community's adoption of energy efficiency in an innovative way, generate workforce development benefits for the larger Buffalo-Niagara region, and to contribute to the resiliency of the electric grid.

The Orchard Community Initiative was established in 2012 by a group of 24 leaders who completed a leadership training program for stakeholders within the Fruit Belt neighborhood. It consists of forward thinking members whose mission is to create a better quality of life for all Fruit Belt residents by providing a collective community environment to be established for and by the residents and those with a vested interest in the Fruit Belt Community.

We welcome the opportunity to further discussions with the BNMC, Inc. and the proposal partners on this project in support of the Fruit Belt Neighborhood, and the wider Buffalo-Niagara region. If you require additional information, please do not hesitate to contact me.

Sincerely,

Zaid B. Islam
President
Orchard Community Initiative

ROM Estimate for STS 1059676			
CSS Changes		600Hours	
Total Technical estimate (IBM & Tariff ModelingOnly)		600Hours	$60,000.00
Project Management	15%	90 Hours	$9,000.00
Business Analyst	10%	60 Hours	$6,000.00
Solution Architect	10%	60 Hours	$6,000.00
Total effort		810 Hours	$81,000.00
Total $ amount to be approved			$81,000.00

Buffalo Niagara Medical Campus

nationalgrid

MEMORANDUM OF UNDERSTANDING AND COLLABORATION AGREEMENT

THIS MEMORANDUM OF UNDERSTANDING AND COLLABORATION AGREEMENT (this "Agreement") dated as of June 1, 2011 and effective as of June 1, 1 2011 (the "Effective Date"), by and between BUFFALO NIAGARA MEDICAL CAMPUS, INC., a not-for-profit corporation duly organized and existing under the laws of the State of New York, having an office at 640 Ellicott Street, Buffalo, New York 14203 ("BNMC" or the "Campus"), and NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID, a corporation duly organized and existing under the laws of the State of New York, having an office at 300 Erie Boulevard West, Syracuse, New York 13202 ("National Grid"), each hereinafter referred to individually as "Party" or both referred to collectively as the "Parties."

WHEREAS, BNMC seeks to pursue energy innovation as a strategic growth area for the medical campus and surrounding neighborhoods, alongside the other two strategic pillars of wellness and entrepreneurship; and

WHEREAS, National Grid seeks to deliver unparalleled safety, reliability, and efficiency to its customers, and is committed to being an innovative, sustainable leader in energy and to safeguarding our global environment for future generations; and

WHEREAS, in response to BNMC's desire to develop an energy innovation strategy, National Grid is able to respond to this market demand and leverage its energy expertise to work with BNMC to formulate this strategy; and

WHEREAS, the collaboration between BNMC and National Grid will enable the development of an integrated, innovative, forward-looking energy plan, including the exploration of smart grid, smart metering, micro-grid, utility asset utilization (inclusive of reliability and quality), alternative fuel vehicles and associated fueling infrastructure, renewable energy sources, economic development initiatives, energy efficiency practices (retrofit and new build), engineering education integration, commercialization of new technologies, pioneering of new business models, collaboration with third parties, and job creation, herein collectively referred to as the "Integrated Energy Plan"; and

WHEREAS in order to effectively engage with the resident institutions on the Campus and collaborate with third parties and other stakeholders that may present synergies to the further development of the Integrated Energy Plan, BNMC and National Grid would like to establish an Energy Innovation Council (the "Council") of which BNMC and National Grid would be the sole leaders and co-chairs (the "Co-Chairs"), with further membership of the Council to be defined at a future date as the Integrated Energy Plan is developed; and

WHEREAS, one of the first projects that the Co-Chairs are working on is a state-of-the-art parking facility (the "Facility") to be located at 134 High Street, Buffalo, New York 14203, within the boundaries of the Campus, and

WHEREAS, the Co-Chairs have determined that the Facility shall be equipped with certain technologies, energy sources, and/or amenities that will be designed to support energy efficiency products, renewable energy sources, alternative energy transportation devices, electric vehicle ("EV") charging stations, metering and potential for electric storage capability amongst other innovations; and

WHEREAS, the Co-Chairs are also currently working on a public right-of-way federally funded infrastructure project to set up a model for a public right-of-way for alternative fuel vehicles (*e.g.*, EVs and compressed natural gas ("CNG") vehicles); and

WHEREAS, BNMC continues to support the development of new and/or renovated facilities and work with Institutions that are joining the Campus or adding capacity to the Campus, and as such National Grid will need to evaluate the changing energy needs of the Campus; and

WHEREAS, in the context of this growth the Co-Chairs desire to identify and develop other energy initiatives that would have the potential to be incorporated into the Integrated Energy Plan that may be extended to surrounding neighborhoods, the Western New York community in general, and beyond, with a goal of the Co-Chairs becoming recognized leaders in designing and demonstrating an integrated, innovative, forward-looking energy plan; and

WHEREAS, the Co-Chairs aim to demonstrate new business models, new approaches, and new technologies through thoughtful innovation, measurement, and verification, in partnership with appropriate technical, business, and academic stakeholders; and

WHEREAS, the Co-Chairs desire to enter into this Agreement to create a framework for each Party to both take a leadership role in the creation of the Integrated Energy Plan and to define the scope and financial and technical impacts and requirements of this Integrated Energy Plan.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

1. Collaboration. National Grid and BNMC agree to work jointly for the sole benefit of the Integrated Energy Plan.

2. Term and Termination. The term of this Agreement shall begin on the Effective Date and shall continue for a period of five (5) years (the "Term"). This Agreement may be terminated at any time, for any reason, by any Party, after providing a 30-day advance notice of intent to terminate.

3. Amendment of Agreement. No amendment, modification or change hereof shall be binding on any Party hereto unless set forth in writing, dated subsequent hereto and executed by both Parties.

4. Independent Contractor. Each Party acknowledges and agrees that the relationship of the Parties hereto is that of independent contractors. None of the terms herein is intended to create nor will be construed to create an agency, partnership or employment relationship among or between the Parties. No Party, nor any its respective officers, members, or employees, will be deemed to be the agent, employee, or representative of the other Party. Each Party agrees to be wholly responsible for and to pay when due all federal, state, and local taxes and contributions for unemployment insurance, Social Security, income tax, and other lawful obligations by virtue of the performance of services hereunder and further agrees to fully comply with all applicable statutes, rules, regulations, and orders of any competent governmental authority.

5. Confidentiality. Each Party covenants and agrees that it shall have the affirmative obligation to hold proprietary information exchanged between and among the Parties in connection with the Integrated Energy Plan (hereinafter, the "Confidential Information") in the strictest of confidence and to protect the Confidential Information from disclosure to any third party. Confidential Information provided by one Party to the other Party shall be clearly marked or otherwise designated "Confidential." Each Party shall take all steps necessary to protect the Confidential Information from impermissible disclosure and shall implement internal procedures to

guard against such disclosure by its employees, agents, and/or assigns. Each Party is entitled to equitable relief, by injunction or otherwise, to enforce its rights under this provision to prevent the release of Confidential Information without bond or proof of damages, and may seek other remedies available at law or in equity for breach of this provision. The Confidential Information shall be used only for the Integrated Energy Plan. The provisions of this article shall survive the termination or expiration of this Agreement.

6. Notices. Any notice required or permitted to be given under this Agreement shall be sufficient if in writing, and if sent by registered mail to each Party's place of business to the following:

BNMC:
Mr. Matthew K. Enstice
President & Chief Executive Officer
Buffalo Niagara Medical Campus
Innovation Center
640 Ellicott Street
Buffalo, NY 14203

National Grid:
Mr. Dennis W. Elsenbeck
Regional Executive
National Grid
144 Kensington Avenue
Buffalo, NY 14214

7. Assignment. This Agreement, and its terms and conditions, shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and permitted assigns. This Agreement may only be assigned by either Party with the written consent of the other Party, which consent shall not be unreasonably withheld, conditioned or denied. Any attempted assignment that violates this section is void and ineffective. Assignment shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason thereof.

8. Limitation of Liability. Neither Party shall be liable to the other Party under this Agreement, except to the extent such liability is caused by the Party's gross negligence or willful misconduct which liability shall not exceed $50,000.00. In no event shall either Party be liable to the other Party for any indirect, special, consequential or punitive damages.

9. Indemnity. To the extent permitted by law, each Party agrees to defend, indemnify and hold harmless the other Party and its affiliates, and its and its affiliates' employees, officers, directors and agents from and against any and all claims, damages, losses and expenses (including reasonable attorneys' fees and costs incurred to enforce this indemnity) (collectively, "Claims) by third parties arising out of this Agreement to the extent caused the negligence or willful misconduct of the indemnifying Party or anyone for whom the indemnifying Party is legally responsible.

10. Insurance. Both Parties agree to maintain insurance coverage at levels that are sufficient to cover their liabilities arising out of this Agreement. If further activities, such as construction of a state-of-the-art parking facility, are contemplated that are beyond the scope of this Agreement, both Parties agree that insurance requirements will be implemented at that point.

11. Governing Law. This Agreement shall be governed by the laws of the State of New York without regard to its conflicts of law principles.

12. No Third Party Beneficiaries. This Agreement is intended for the benefit of the Parties hereto and does not grant any rights to any third parties.

13. Entire Agreement. This Agreement constitutes the entire agreement between the Parties and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this Agreement.

14. Multiple Counterparts. This Agreement may be executed in two or more counterparts, each of which is deemed as the original but all constitute one and the same instrument.

15. Severability. If any provision of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction, such portion or provision shall be deemed separate and independent and the remainder of this Agreement shall remain in full force and effect.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the day and year first above written.

BUFFALO NIAGARA MEDICAL CAMPUS, INC.

By: _____

Name: Matthew K. Enstice

Title: President and CEO

Date: 6/6/11

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID

By: _____

Name: Neil Proudman

Title: Vice President, Operations Support

Date: 6/13/11

Appendix F: Clifton Park Customer Convenience

Memorandum of Understanding

July 1, 2015

Earth Networks, Inc.
Honeywell Smart Grid Solutions
Opower, Inc.
Sealed, Inc.
Silver Spring Networks, Inc.
Utilidata, Inc.

MEMORANDUM OF UNDERSTANDING

NY REV DEMONSTRATION PROJECT

This Memorandum of Understanding (this "MOU") is effective as of June 30, 2015 ("Effective Date"), by and between Earth Networks, Inc. a Delaware corporation ("Earth Networks") and Niagara Mohawk Power Corporation d/b/a National Grid, a New York corporation ("National Grid" or "Company"). Each referred to herein as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, on February 26, 2015, the New York Public Services Commissions (NYPSC) issued a Reforming the Energy Vision order ("REV Order") adopting a regulatory policy framework and implementation plan; and

WHEREAS, National Grid and Earth Networks seek to collaborate their efforts in order to conduct demonstration projects to animate the energy markets and bring new solutions to customers as required by the REV Order in collaboration with Earth Networks; and

WHEREAS, the Parties would demonstrate and test new energy pricing plans as well as the adoption of distributed energy resources for customers in Clifton Park, New York ("Project"); and

WHEREAS, the objective of the Project is to demonstrate new business models, new approaches, and new technologies through thoughtful innovation, measurement, and verification, in partnership with appropriate technical, business, and academic stakeholders.

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, The Company and Earth Networks have the following understanding:

1. Purpose The purpose of this MOU is to set forth the Parties' mutual understanding of the:

(a) roles and responsibilities of each Party in regards to the design and implementation of the Reforming Energy Vision (REV) demo project in Clifton Park,

(b) intent of the Parties with respect to working together to execute Project; and

(c) scope of work of the Project

2. Project. The Parties agree to work together to execute the Project.

(a) Responsibilities of National Grid:

(i) Subject to confidentiality protections and obligations under a Non-Disclosure Agreement between the Parties, National Grid will provide access to systems, data and customers who choose to participate in services provided by Earth Networks to allow Earth Networks to perform the services described below.

(b) Responsibilities of Earth Networks

With respect to the WeatherBug Home suite of offerings:

(i) Earth Networks will integrate into National Grid systems to obtain, analyze and display smart meter data once the Clifton Park meters are installed. National Grid will provide 15 minute delayed data so Earth Networks can provide near real-time views into energy usage and analytics based on each home's thermodynamic model. This information will be provided to the engagement partner to inform consumers on how their usage compares to their like-sized neighbors and why and how they use energy on any given day, week and month. Earth Networks will disaggregate usage data into base, variable and HVAC loads, and will provide this data

to the engagement partner for the purpose of monthly usage alerts. Earth Networks will integrate into standard National Grid systems and data formats to complete this task. Earth Networks will integrate, optimize, analyze and display connected thermostats, water heaters and appliances for demand response and potentially energy efficiency. This includes, but is not limited to, automated weather optimization and personalized thermostat tips and neighbor comparisons to be developed in collaboration with the engagement partner. In addition, Earth Networks will reduce peak load via demand response on the thermostats, using derived thermodynamic house models, pre-cooling algorithms and demand response optimization algorithms to maximize demand response capacity while minimizing occupant discomfort. Earth Networks will also use the tips and alerting functionality of our mobile app for customer outreach and to reinforce positive energy efficiency ("EE") and demand response ("DR") behaviors, which will be developed by and coordinated with the engagement partner. Earth Networks may receive a share of the incentive payments that are due to the Clifton Park customer who deliver EE savings beyond the baseline for EE savings established by National Grid. Earth Networks will display data and analytics from connected appliances that are part of the project to educate customers on the energy use of those appliances, encourage efficient behavior, and notify customers when the devices are in DR mode. Earth Networks may integrate into New York Independent System Operator ("NYISO") systems and processes to bid Clifton park DR capacity into the New York energy and capacity markets. Earth Networks will maximize the value of the DR capacity in the market, and may receive incentive payments for delivering DR revenue above an established baseline mutually agreed upon by Earth Networks and National Grid.

(ii) Earth Networks will integrate with other Clifton Park Project partners to provide the results of our analytics to them so they can perform their duties more efficiently. For example:

- Earth Networks will integrate with thermostat OEMs to use their thermostats for demand response, and to provide energy efficiency set point optimization.
- Earth Networks will integrate with the engagement partner and marketing partners to provide WBH analytics results for use in the behavioral and community engagement aspects of the project
- Earth Networks will integrate with other device manufacturers that National Grid specifies to show usage information in the WeatherBug mobile app, to perform DR, and to encourage energy efficient behavior.

3. Resources. The Parties agree to allocate the necessary technical and business resources for the implementation of the Project in a timely manner. National Grid agrees to allocate one (1) Program Manager and an appropriate team which will be under the direction of National Grid. Earth Networks agrees to allocate an appropriate team which shall be under the direction of the Earth Networks Project Manager.

4. Equipment and Financial Contributions. The Parties will cooperate to identify the specific equipment needed and each Party's financial contributions needed for the successful implementation and completion of Project. Specifically, Earth Networks' financial contribution to the Project may include:

(a) To ensure adequate weather station coverage in the Clifton Park area, in the spirit of partnership, Earth Networks may donate one weather station for each station that National Grid purchases. Through the National Grid weather station donation program, National Grid and Earth Networks have demonstrated the community goodwill and engagement that comes with donating weather station system to local schools and community centers. This engagement will be invaluable as National Grid embarks in fundamentally changing the way Clifton Park residents engage with National Grid.

(b) May provide access to the Earth Networks StreamerRT weather visualization tool for Clifton Park emergency management and school district personnel for access to local, real-time weather conditions and forecast to improve their weather related decision-making. This access is part of the community outreach part of the Project.

(c) Earth Networks may contribute advertising inventory in our WeatherBug online and desktop properties geo-targeted to Clifton Park to support the program and engage the Clifton Park community in the project.

Earth Networks may support community outreach with in-kind media and marketing support.

(d) Earth Networks may pursue a "pay for performance" revenue model whereby annual payments are based upon achievement of DR and /or energy efficiency savings beyond an established baseline.

5. Execution of Definitive Agreements. The Parties will continue to cooperate after the execution of this MOU to establish a definitive agreement that will govern the relationship within sixty (60) days after the Company receives NYPSC approval to move forward with the Project.

6. Confidential Information and Publicity. The Parties' obligations with respect to Confidential Information shall be governed by a Non-Disclosure Agreement to be entered into by the Parties.

7. Costs. All costs and expenses incurred by a Party in connection with the Project, including, without limitation, the negotiation and execution of this MOU, any due diligence review and/or the negotiations related to the Project, shall be borne solely by the Party that incurred such costs or expenses, unless otherwise agreed upon in writing by the Parties.

8. Term and Termination. This MOU may be terminated at any time, for any reason, by either Party, after providing to the other Party a sixty (60) days advance written notice of intent to terminate.

9. No Joint Venture. By execution of this MOU, the Parties are not creating any joint venture, agency, or fiduciary obligations between the Parties. Rather, the Parties are independent contractors and neither Party has any power to bind the other Party for any purpose.

10. Amendments. This MOU may only be amended or modified by a written agreement signed by both Parties.

11. Legal Effect. Each Party acknowledges and agrees that the Binding Provisions (as set forth in Section 21 below are intended to be and shall be legally binding and enforceable. Except for the matters specifically set forth as the Binding Provisions, this MOU (including specifically the Recitals) is not intended to, and does not, create any legally binding obligations or liabilities on the Parties of this MOU

12. Notices. Any notice, request or other communication required or permitted to be given under this MOU must be in writing and will be sent by one of the following means: electronic mail, facsimile transmission, hand delivery or courier to the other Party at the addresses set forth below:

Earth Networks, Inc.:	Earth Networks, Inc. Daniel W. O'Connell SVP & General Counsel 12410 Milestone Center Dr. Germantown, MD 20876 Phone: 301-250-4145 Email: doconnell@earthnetworks.com
National Grid:	Niagara Mohawk Power Corporation d/b/a National Grid Mr. Carlos Nouel Director of Alliances and Vendor Strategy National Grid 40 Sylvan Road, Waltham, MA 02451 Phone: (781) 907-1785 Email: carlos.nouel@nationalgrid.com

Any such notice, request or other communication shall be deemed to have been duly given or made and to have become effective at the time of receipt thereof if received during normal business hours in the place of receipt, or otherwise at the opening of business on the business day in the place of receipt, immediately following the day of receipt. Notices given hereunder by electronic mail or facsimile, followed by the signed original hardcopy, will be deemed to have been effectively given the day indicated on the confirmation accompanying the electronic submission or facsimile. Any Party may, by written notice to another Party, change the address to which notices, requests or other communications to such Party are to be delivered.

13. Counterparts. This MOU may be executed in any number of counterparts with the same effect as if each Party had signed the same document. All counterparts shall be construed together and constitute one and the same instrument. This MOU may be executed by delivery of facsimile or electronic signatures.

14. Third Party Beneficiaries. Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

15. Assignment. This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other non-assigning Party, which consent may be withheld at the discretion of the non-assigning Party; *provided*, either National Grid may assign this MOU to one of its Affiliates without notice.

16. No Waiver. Failure by a Party to exercise, or any delay on the part of a Party in exercising, any right, remedy, power or privilege under this MOU shall not operate as a waiver of any such right, remedy, power or privilege. No single or partial exercise of any right, remedy, power or privilege hereunder shall preclude any other or further exercise of the same or of any other right, remedy, power or privilege.

17. Headings. The headings of the Sections of this MOU are inserted for convenience only and do not constitute a part hereof or affect in any way the meaning or interpretation of this MOU.

18. Governing Law. THIS MOU SHALL BE GOVERNED BY, CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO ANY CONFLICTS OF LAWS RULE THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

19. Forum. Any dispute (other than to enforce a judgment) must be brought in state or federal court in New York City, New York; each Party hereby irrevocably waives any right to trial by jury.

20. Entire Agreement. This MOU constitutes the entire understanding between the Parties hereto with respect to the subject matter herein and supersede and cancel any prior written understandings, agreements, representations, warranties, or communications, whether oral or written, between the Parties relating to the subject matter herein.

21. Binding Provisions. The Parties agree that Sections 6, 7, 11 and 18 are legally binding ("Binding Provisions").

22. Definitions. For purposes of this MOU, the following capitalized terms shall have the following meanings:

"Affiliate" shall mean, when used with respect to a specified Person at any time, any other Person that directly or indirectly, through one or more intermediaries, Controls, is Controlled by, or is under common Control with, such specified Person at such time.

"Control" shall mean, when used with respect to any specified Person, (i) the possession, directly or indirectly, of the power or authority to direct or cause the direction of the management and policies of such specified Person (which, in the case of a publicly traded master limited partnership, means such power or authority with

respect to the general partner thereof), whether through the ownership of voting securities, as a trustee, by contract, or otherwise, or (ii) the ownership of more than 50% of the voting ownership interest in such specified Person.

"Person" shall mean any natural person, firm, individual, corporation, business trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.

[*Signatures are on the following page.*]

This MOU is signed to by the Parties as of the Effective Date.

Earth Networks, Inc.

By: _____
Name: DANIEL W. O'CONNELL
Title: VP & GENERAL COUNSEL

Niagara Mohawk Power Corporation d/b/a National Grid

By: _____
Name: EDWARD H. WHITE JR
Title: VICE PRESIDENT

Signature Page to Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING

NY REV DEMONSTRATION PROJECT

This Memorandum of Understanding (this "MOU") is effective as of June 30, 2015 ("Effective Date"), by and between Honeywell International Inc. d/b/a Honeywell Smart Grid Solutions division ("Honeywell") a Delaware corporation and Niagara Mohawk Power Corporation d/b/a National Grid, a New York corporation ("National Grid" or "Company"). Each referred to herein as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, on February 26, 2015, the New York Public Services Commissions (NYPSC) issued a Reforming the Energy Vision order ("REV Order") adopting a regulatory policy framework and implementation plan; and

WHEREAS, National Grid and Honeywell seek to collaborate their efforts in order to conduct demonstration projects to animate the energy markets and bring new solutions to customers as required by the REV Order in collaboration with Honeywell ; and

WHEREAS, the Parties would demonstrate and test new energy pricing plans as well as the adoption of distributed energy resources for customers in Clifton Park, New York ("Project"); and

WHEREAS, the objective of the Project is to demonstrate new business models, new approaches, and new technologies through thoughtful innovation, measurement, and verification, in partnership with appropriate technical, business, and academic stakeholders; and

WHEREAS, Honeywell has provided National Grid with a proposal (dated April 25, 2015) whereby it proposed a program approach that offered marketing and installation services of weatherization and wi-fi thermostat products to National Grid's residential customers of Clifton Park, New York; and

WHEREAS, Honeywell recognizes that this Project's SOW is still fluid and may change given National Grid's customer feedback, the Project modeling, NYPSC review and feedback, as well as discussions amongst National Grid and its current Project partner's final SOW considerations.

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, The Company and Honeywell have the following understanding:

1. Purpose The purpose of this MOU is to set forth the Parties' mutual understanding of the:

(a) proposed roles and responsibilities of each Party in regards to the design and implementation of the Reforming Energy Vision (REV) demo project in Clifton Park,

(b) intent of the Parties with respect to working together to execute Project; and

(c) proposed scope of work ("SOW") of the Project

2. Project. The Parties agree to work in good faith, using commercially reasonable efforts to develop a plan that supports the Project.

(a) proposed Responsibilities of National Grid:

(i) Overall Project design, process flow and management, interface with the NYPSC, interface with other Project partners, marketing plan/collateral material approval, customer service script and Project forms approval, energy audit and measure installation material and process approvals, data base and reporting co-design and approvals, Evaluation, Measurement and Verification (EM&V) design and implementation, and distribution of Partner compensation.

(b) Proposed Responsibilities of Honeywell:

(i) As supported by our proposal, Honeywell is prepared to provide Project marketing, customer interface including enrollment and appointment scheduling; as well as supply materials and perform weatherization and wi-fi thermostat installations. Furthermore, Honeywell could collect data and/or produce other initial Partner work orders for appliance replacement, solar PV installation, battery storage installation, and electric vehicle charge station feasibility. Additionally, Honeywell can provide our ContractorPro Portal to link HVAC contractors in the Clifton Park area with those customers participating in the Project so that the customer's HVAC systems can be monitored 24/7 for performance, early degradation or system attention needs, thus ensuring optimal system efficiency. Finally, Honeywell is prepared to provide work order management, inventory control, customer service call support, and other administrative services as necessary.

3. Resources. The Parties agree to allocate the necessary technical and business resources to fulfill the objectives listed under Section 1 and 2 above for the implementation of the Project in a timely manner. National Grid agrees to allocate one (1) Program Manager and an appropriate team which will be under the direction of National Grid. Honeywell agrees to allocate an appropriate team which shall be under the direction of the Project Manager (PM) to be named in the definitive agreement.

4. Equipment and Financial Contributions. The Parties will cooperate to propose the specific equipment needed and each Party's financial contributions needed that may be used towards the successful implementation and completion of Project. Honeywell's proposed financial contribution to the Project will include:

(a) the provision of products and services offered to Clifton Park residents through a compensation mechanism that pursues non-traditional revenue models which may include: a model where customers pay for installed products and services on their monthly energy bill from the energy savings generated by those products and services, the monetizing of Project savings, revenue and margin sharing with National Grid and more. A compensation plan will be completed in conjunction with the final Project fiscal model and shall be mutually agreed upon between National Grid and Honeywell.

5. Execution of Definitive Agreements. The Parties will continue to cooperate in good faith using commercially reasonable efforts after the execution of this MOU towards the establishment of a definitive agreement that will govern the relationship within sixty (60) days after the Company receives NYPSC approval to move forward with the Project.

6. Confidential Information and Publicity. The Parties' obligations with respect to Confidential Information shall be governed by the Non-Disclosure Agreement to be entered into by the Parties.

7. Costs. All costs and expenses incurred by a Party in connection with the Project, including, without limitation, the negotiation and execution of this MOU, any due diligence review and/or the negotiations related to the Project, shall be borne solely by the Party that incurred such costs or expenses, unless otherwise agreed upon in writing by the Parties.

8. Term and Termination. This MOU may be terminated at any time, for any reason, by either Party, after providing to the other Party a sixty (60) days advance written notice of intent to terminate.

9. No Joint Venture. By execution of this MOU, the Parties are not creating any joint venture, agency, or fiduciary obligations between the Parties. Rather, the Parties are independent contractors and neither Party has any power to bind the other Party for any purpose.

10. Amendments. This MOU may only be amended or modified by a written agreement signed by both Parties.

11. Legal Effect. Each Party acknowledges and agrees that the Binding Provisions (as set forth in Section 21 below are intended to be and shall be legally binding and enforceable. Except for the matters specifically

set forth as the Binding Provisions, this MOU (including specifically the Recitals) is not intended to, and does not, create any legally binding obligations or liabilities on the Parties of this MOU

12. Notices. Any notice, request or other communication required or permitted to be given under this MOU must be in writing and will be sent by one of the following means: electronic mail, facsimile transmission, hand delivery or courier to the other Party at the addresses set forth below:

Honeywell International Inc. d/b/a under its Honeywell Smart Grid Solutions division:	Honeywell International Inc. d/b/a Honeywell Smart Grid Solutions division Wayne Interchange Plaza I 145 Route 46 West Wayne, NJ 07470 Attn: Dave Holland Phone: (973) 890-9500 Facsimile: (973) 890-1531 Email: dave.holland@honeywell.com
National Grid:	Niagara Mohawk Power Corporation d/b/a National Grid Mr. Carlos Nouel Director of Alliances and Vendor Strategy National Grid 40 Sylvan Road, Waltham, MA 02451 Phone: (781) 907-1785 Facsimile: N/A Email: carlos.nouel@nationalgrid.com

Any such notice, request or other communication shall be deemed to have been duly given or made and to have become effective at the time of receipt thereof if received during normal business hours in the place of receipt, or otherwise at the opening of business on the business day in the place of receipt, immediately following the day of receipt. Notices given hereunder by electronic mail or facsimile will be deemed to have been effectively given the day indicated on the confirmation accompanying the electronic submission or facsimile. Any Party may, by written notice to another Party, change the address to which notices, requests or other communications to such Party are to be delivered.

13. Counterparts. This MOU may be executed in any number of counterparts with the same effect as if each Party had signed the same document. All counterparts shall be construed together and constitute one and the same instrument. This MOU may be executed by delivery of facsimile or electronic signatures.

14. Third Party Beneficiaries. Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

15. Assignment. This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other non-assigning Party, which consent may be withheld at the discretion of the non-assigning Party; *provided*, either National Grid may assign this MOU to one of its Affiliates without notice.

16. No Waiver. Failure by a Party to exercise, or any delay on the part of a Party in exercising, any right, remedy, power or privilege under this MOU shall not operate as a waiver of any such right, remedy, power or

privilege. No single or partial exercise of any right, remedy, power or privilege hereunder shall preclude any other or further exercise of the same or of any other right, remedy, power or privilege.

17. Headings. The headings of the Sections of this MOU are inserted for convenience only and do not constitute a part hereof or affect in any way the meaning or interpretation of this MOU.

18. Governing Law. THIS MOU SHALL BE GOVERNED BY, CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO ANY CONFLICTS OF LAWS RULE THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

19. Forum. Any dispute (other than to enforce a judgment) must be brought in state or federal court in New York City, New York; each Party hereby irrevocably waives any right to trial by jury.

20. Entire Agreement. This MOU constitutes the entire understanding between the Parties hereto with respect to the subject matter herein and supersede and cancel any prior written understandings, agreements, representations, warranties, or communications, whether oral or written, between the Parties relating to the subject matter herein.

21. Binding Provisions. The Parties agree that Sections 6, 7, 11 and 18 are legally binding ("Binding Provisions").

22. Definitions. For purposes of this MOU, the following capitalized terms shall have the following meanings:

"Affiliate" shall mean, when used with respect to a specified Person at any time, any other Person that directly or indirectly, through one or more intermediaries, Controls, is Controlled by, or is under common Control with, such specified Person at such time.

"Control" shall mean, when used with respect to any specified Person, (i) the possession, directly or indirectly, of the power or authority to direct or cause the direction of the management and policies of such specified Person (which, in the case of a publicly traded master limited partnership, means such power or authority with respect to the general partner thereof), whether through the ownership of voting securities, as a trustee, by contract, or otherwise, or (ii) the ownership of more than 50% of the voting ownership interest in such specified Person.

"Person" shall mean any natural person, firm, individual, corporation, business trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.

[Signatures are on the following page.]

This MOU is agreed to by the Parties as of the Effective Date.

Honeywell International Inc. d/b/a under its Honeywell Smart Grid Solutions division
By: _____
Name: Stan VanDemoot
Title: Senior Contracts Manager

Niagara Mohawk Power Corporation d/b/a National Grid

By: _____
Name: EDWARD H. WHITE JR.
Title: VICE PRESIDENT

Signature Page to Memorandum of Understanding

Appendix F

MEMORANDUM OF UNDERSTANDING

NY REV DEMONSTRATION PROJECT

This Memorandum of Understanding (this "MOU") is effective as of June 30, 2015 ("Effective Date"), by and between Opower, Inc. a Delaware corporation ("Opower") and Niagara Mohawk Power Corporation d/b/a National Grid, a New York corporation ("National Grid" or "Company"). Each referred to herein as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, on February 26, 2015, the New York Public Services Commissions ("NYPSC") issued a Reforming the Energy Vision order ("REV Order") adopting a regulatory policy framework and implementation plan; and

WHEREAS, National Grid and Opower seek to collaborate their efforts in order to conduct demonstration projects to animate the energy markets and bring new solutions to customers as required by the REV Order in collaboration with Opower; and

WHEREAS, the Parties would demonstrate and test new energy pricing plans as well as the adoption of distributed energy resources for customers in Clifton Park, New York ("Project"); and

WHEREAS, the objective of the Project is to demonstrate new business models, new approaches, and new technologies through thoughtful innovation, measurement, and verification, in partnership with appropriate technical, business, and academic stakeholders; and

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, The Company and Name of the Opower have the following understanding:

1. Purpose. The purpose of this MOU is to set forth the Parties' mutual understanding of the:

(a) roles and responsibilities of each Party in regards to the design and implementation of the Reforming Energy Vision ("REV") Project,

(b) intent of the Parties with respect to working together to execute Project;

(c) scope of work of the Project.

2. Project. The Parties agree to work together to execute the Project.

(a) Responsibilities of National Grid:

(i) To provide access to data as allowed by the NYPSC and provide internal staff resources sufficient to meet Project objectives as the partners with further define in the statement of work ("SOW").

(b) Responsibilities of Opower:

(i) To provide data analytics platform, web portal, and customer communications and marketing resources sufficient to meet Project objectives, including to support National Grid's program goals and as further defined in the SOW:

- to educate customers on and transition them to levelized bills;
- to drive adoption of energy efficiency retrofits, appliances that can be used as demand response resources, and residential solar technologies;
- to show customers the value of their energy efficiency retrofits, appliances, and solar investments after the purchase;
- to transform the web, email and paper billing experiences into valuable and engaging "REV-like" customer communication channels to enable use of those communication opportunities to drive pilot results; and
- to demonstrate sufficient value from the Pilot that its components can be successfully implemented on a broader scale.

3. Resources. The Parties agree to allocate the necessary technical and business resources for the implementation of the Project in a timely manner. National Grid agrees to allocate one (1) Program Manager and an appropriate team which will be under the direction of National Grid. Opower agrees to allocate an appropriate team, which shall be under the direction of an Opower Program Manager.

4. Equipment and Financial Contributions. The Parties will cooperate to identify the specific equipment needed and each Party's financial contributions needed, if any, for the successful implementation and completion of the Project, which will be finally agreed upon as part of the Definitive Agreement, as defined below. Specifically, Opower's financial contribution to the Project may include:

(a) discounted product development and delivery costs for new uses of the Opower platform, and

(b) discounted platform and solution licenses and communication fees for customer communications.

5. Execution of Definitive Agreements. The Parties will continue to cooperate after the execution of this MOU to establish a definitive agreement consisting of a SOW describing the specific terms of the Project and the existing Implementation and Licensing Agreement, signed by the Parties and dated as of June 18, 2009, ("Definitive Agreement") that will govern the relationship within sixty (60) days after the Company receives NYPSC approval to move forward with the Project.

6. Confidential Information and Publicity. The Parties' obligations with respect to Confidential Information shall be governed by the Non-Disclosure Agreement dated September 24, 2010.

7. Costs. All costs and expenses incurred by a Party in connection with the negotiation and execution of this MOU, any due diligence review and/or the negotiations related to the Project, shall be borne solely by the Party that incurred such costs or expenses, unless otherwise agreed upon in writing by the Parties.

8. Term and Termination. This MOU may be terminated at any time, for any reason, by either Party, after providing to the other Party a sixty (60) days advance written notice of intent to terminate.

9. No Joint Venture. By execution of this MOU, the Parties are not creating any joint venture, agency, or fiduciary obligations between the Parties. Rather, the Parties are independent contractors and neither Party has any power to bind the other Party for any purpose.

10. Amendments. This MOU may only be amended or modified by a written agreement signed by both Parties.

11. Legal Effect. Each Party acknowledges and agrees that the Binding Provisions (as set forth in Section 21 below are intended to be and shall be legally binding and enforceable. Except for the matters specifically

set forth as the Binding Provisions, this MOU (including specifically the Recitals) is not intended to, and does not, create any legally binding obligations or liabilities on the Parties of this MOU.

12. Notices. Any notice, request or other communication required or permitted to be given under this MOU must be in writing and will be sent by one of the following means: electronic mail, facsimile transmission, hand delivery or courier to the other Party at the addresses set forth below:

Opower:	Opower, Inc. 1515 North Courthouse Rd., 8th Floor Arlington, VA 22201 Attn: General Counsel Phone: 703 778 4544 Facsimile: 703 778 4547 Email: legal@opower.com
National Grid:	Niagara Mohawk Power Corporation d/b/a National Grid Mr. Carlos Nouel Director of Alliances and Vendor Strategy National Grid 40 Sylvan Road, Waltham, MA 02451 Phone: (781) 907-1785 Email: carlos.nouel@nationalgrid.com

Any such notice, request or other communication shall be deemed to have been duly given or made and to have become effective at the time of receipt thereof if received during normal business hours in the place of receipt, or otherwise at the opening of business on the business day in the place of receipt, immediately following the day of receipt. Notices given hereunder by electronic mail or facsimile will be deemed to have been effectively given the day indicated on the confirmation accompanying the electronic submission or facsimile. Any Party may, by written notice to another Party, change the address to which notices, requests or other communications to such Party are to be delivered.

13. Counterparts. This MOU may be executed in any number of counterparts with the same effect as if each Party had signed the same document. All counterparts shall be construed together and constitute one and the same instrument. This MOU may be executed by delivery of facsimile or electronic signatures.

14. Third Party Beneficiaries. Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

15. Assignment. This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other non-assigning Party, which consent may be withheld at the reasonable discretion of the non-assigning Party; *provided*, National Grid may assign this MOU to one of its Affiliates on notice to Partner.

16. No Waiver. Failure by a Party to exercise, or any delay on the part of a Party in exercising, any right, remedy, power or privilege under this MOU shall not operate as a waiver of any such right, remedy, power or privilege. No single or partial exercise of any right, remedy, power or privilege hereunder shall preclude any other or further exercise of the same or of any other right, remedy, power or privilege.

17. Headings. The headings of the Sections of this MOU are inserted for convenience only and do not constitute a part hereof or affect in any way the meaning or interpretation of this MOU.

18. Governing Law. THIS MOU SHALL BE GOVERNED BY, CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO ANY CONFLICTS OF LAWS RULE THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

19. Forum. Any dispute (other than to enforce a judgment) must be brought in state or federal court in New York City, New York; each Party hereby irrevocably waives any right to trial by jury.

20. Entire Agreement. This MOU constitutes the entire understanding between the Parties hereto with respect to the subject matter herein and supersede and cancel any prior written understandings, agreements, representations, warranties, or communications, whether oral or written, between the Parties relating to the subject matter herein.

21. Binding Provisions. The Parties agree that Sections 6, 7, 11 and 18 are legally binding ("Binding Provisions").

22. Definitions. For purposes of this MOU, the following capitalized terms shall have the following meanings:

"Affiliate" shall mean, when used with respect to a specified Person at any time, any other Person that directly or indirectly, through one or more intermediaries, Controls, is Controlled by, or is under common Control with, such specified Person at such time.

"Control" shall mean, when used with respect to any specified Person, (i) the possession, directly or indirectly, of the power or authority to direct or cause the direction of the management and policies of such specified Person (which, in the case of a publicly traded master limited partnership, means such power or authority with respect to the general partner thereof), whether through the ownership of voting securities, as a trustee, by contract, or otherwise, or (ii) the ownership of more than 50% of the voting ownership interest in such specified Person.

"Person" shall mean any natural person, firm, individual, corporation, business trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.

[*Signatures are on the following page.*]

This MOU is agreed to by the Parties as of the Effective Date.

Opower, Inc.

By: _____
Name: Thomas G. Kramer
Title: Chief Financial Officer

Niagara Mohawk Power Corporation d/b/a National Grid

By: _____
Name: EDWARD H. WHITE JR.
Title: VICE PRESIDENT

Appendix F

MEMORANDUM OF UNDERSTANDING

NY REV DEMONSTRATION PROJECT

This Memorandum of Understanding (this "MOU") is effective as of July 1, 15 ("Effective Date"), by and between Sealed Inc. ("Sealed"), a Delaware corporation and Niagara Mohawk Power Corporation d/b/a National Grid, a New York corporation ("National Grid" or "Company"). Each referred to herein as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, on February 26, 2015, the New York Public Services Commissions (NYPSC) issued a Reforming the Energy Vision order ("REV Order") adopting a regulatory policy framework and implementation plan; and

WHEREAS, National Grid and Sealed seek to collaborate their efforts in order to conduct demonstration project to animate the energy markets and bring new solutions to customers as required by the REV Order in collaboration with Sealed; and

WHEREAS, the Parties would demonstrate and test new energy pricing plans as well as the adoption of distributed energy resources for customers in Clifton Park, New York ("Project"); and

WHEREAS, the objective of the Project is to demonstrate new business models, new approaches, and new technologies through thoughtful innovation, measurement, and verification, in partnership with appropriate technical, business, and academic stakeholders.

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, The Company and Sealed have the following understanding:

1. Purpose The purpose of this MOU is to set forth the Parties' mutual understanding of the:

(a) roles and responsibilities of each Party in regards to the design and implementation of the Reforming Energy Vision (REV) demo project in Clifton Park, New York;

(b) intent of the Parties with respect to working together to execute Project; and

(c) scope of work of the Project.

2. Project. The Parties agree to work together to execute the Project.

(a) Responsibilities of National Grid:

(i) Company may provide upfront capital required to execute the Project for twelve (12) months, with the option to extend for up to twenty-four (24) months following the approval by the New York Public Service Commission of Company's REV filing, or when the Company deems the Project's pilot period to be complete. If Company does not provide all upfront capital, Company will work with Sealed to identify alternative funding sources.

(ii) Company will provide to Sealed the specific (i) Company financial return requirements for revenue resulting from the Project and (ii) the formula for the monetary benefit that the Company will retain for claiming energy savings from Project performance.

(iii) Company will allow Sealed to leverage Company's name and logo in connection with Sealed's energy savings guarantee and any related financial products as approved by the Company. Sealed will be able to reference a direct partnership with Company. Sealed understands that it shall not use the National Grid name and logo and/or marketing materials without prior written approval.

(iv) Company will utilize existing marketing channels and any other marketing resources set aside for the Project to contact customers for the purpose of Project participation and will direct interested customers directly to Sealed.

(v) Company will provide Sealed with electric and/or natural gas meter data for all residential customers in the Project service territory on an anonymized basis according to any and all applicable rules set by the New York State Public Service Commission for the purpose of supplementing Sealed's existing data sets that aim to accurately calculate expected energy savings.

(vi) Company will provide Sealed with personally identifiable electric and/or natural gas meter data as well as any other available data relevant for residential customers in Clifton Park who opt-in to the program or choose to share their data with Sealed for the purpose of guaranteeing savings and providing information for those customers as well as the Company and any other Project partners approved by the Company to receive that data.

(vii) Company will, within two weeks of submission by Sealed, approve, and provide any necessary edits that would be approved, for all Sealed communications that include the National Grid name and logo.

(viii) Company has the right to claim any energy savings resulting from the Project with the New York Public Service Commission and/or any other body it deems appropriate.

(ix) Company has the right to guarantee savings above and beyond what Sealed is able and willing to guarantee.

(x) Company has the right to offer customers additional products and services via the Sealed Energy Bill regardless of branding decisions, but subject to the Parties reaching mutual written agreement in good faith to promote these products and services.

(xi) Under the Project, Company has the right to inspect homes and/or directly contact customers or hire a third parties to perform these services on the Company's behalf to determine the customers' experience and satisfaction with Sealed.

(xii) Company retains the right to disqualify any Sealed proposed partner from participation in the Project. All Sealed partners and subcontractors must be approved by Company and adhere to any Company standards and requirements for contractors.

(b) Responsibilities of Sealed:

(i) Sealed may offer and provide an energy savings guarantee for all Company customers in the Project territories that meet minimum eligibility thresholds;

(ii) Sealed and Company will jointly agree on the energy-saving home improvements for which the energy savings guarantee will apply and as well as the associated savings calculations for these energy-saving home improvements;

(iii) The Sealed energy savings guarantee may be implemented as an energy savings guarantee to the Company, with all customer-facing communications and bill materials branded as the Company;

(iv) Sealed will identify, vet, and manage construction partners associated with Project improvements such as insulation, air sealing, heating system, cooling system, health, safety and/or appliance work.

(v) Sealed will offer all of the products and services provided by other Project partners to eligible customers as requested by Company in the context of the Project designs and goals.

(vi) Sealed will provide, within reason, any requested training, assistance and support for Company staff and/or Project partner staff implementing the Project.

(vii) Sealed will provide any and all services requested by Company to execute the energy savings guarantee, which may include directly billing customers, collecting customer payments, paying customers' actual energy bills in a billing agent capacity, and paying partner bills.

(viii) Sealed will, if requested, customize the Sealed Energy Bill software to include branding requested by Company, which may include the National Grid name and logo and/or other brands requested by National Grid, with any subsequent changes subject to Parties reaching agreement in good faith.

(ix) Sealed will customize and update the Sealed Efficiency Sales Software as necessary to offer Project products and services in customers' homes.

(x) Sealed will provide customer enrollment in the energy savings guarantee, including obtaining any required utility company billing agent authorization and/or auto-debit authorization.

(xi) Sealed will include customized messages from Company in the Sealed Energy Bills as requested by Company subject to the Parties reaching agreement in good faith.

(xii) Sealed will not, in the Sealed Energy Bills or otherwise, convey any messages, offers from third parties, referrals or recommendations to any customers without Company's prior written consent.

(xiii) Sealed will provide any information, data, or customer access in the context of the evaluation of the Project that are requested by Company and/or any third parties the Company directs to cooperate with.

(xiv) Sealed will follow any and all data collection or other procedures prescribed by Company and/or Project partners necessary to ensure scalability of financing solutions related to the Project.

(xv) Sealed will provide Company with a calculation of measured savings based on Sealed's actuarial models on or before the end of the Project, with any and all back-up requested by the Company, the Public Service Commission, and/or other third parties designated by the Company.

(xvi) Sealed will sign the Company's Non-Disclosure Agreement with the attached Information Security Addendum which shall protect, and restrict the use and disclosure of confidential, proprietary and nonpublic information, including without limitation, customer information and personally identifiable information.

3. Resources. The Parties agree to allocate the necessary technical and business resources for the implementation of the Project in a timely manner. National Grid agrees to allocate one (1) Program Manager and an appropriate team which will be under the direction of National Grid. Sealed agrees to allocate an appropriate team, which shall be under the direction of Andrew Frank.

4. Equipment and Financial Contributions. The Parties will cooperate to identify the specific equipment needed and each Party's financial contributions needed for the successful implementation and completion of Project. Specifically, Sealed financial contribution to the Project will include:

(i) Sealed will forego any profit from the Project not related to measured energy savings received directly from customers.

(ii) Sealed will devote commercially reasonable resources necessary to develop, deploy, and manage the Project.

(iii) Sealed will leverage and further develop core energy savings analytics that benefit the Project at no cost to the Company.

(iv) Sealed will devote any and all internal resources from existing employees necessary to train persons hired by Sealed to execute the Project.

5. Execution of Definitive Agreements. The Parties will continue to cooperate after the execution of this MOU to establish a definitive agreement that will govern the relationship within sixty (60) days after the Company receives NYPSC approval to move forward with the Project.

6. Confidential Information and Publicity. The Parties' obligations with respect to confidential information shall be governed by a Non-Disclosure Agreement and the Information Security Addendum ("ISA") to be entered into by the Parties. The ISA protects the Company's disclosure to Sealed, and Sealed's use, of personally identifiable information.

7. Intellectual Property. No license or other rights to the intellectual property of the Company or Sealed is granted or implied in this Agreement.

8. Costs. All costs and expenses incurred by a Party in connection with the Project, including, without limitation, the negotiation and execution of this MOU, any due diligence review and/or the negotiations related to the Project, shall be borne solely by the Party that incurred such costs or expenses, unless otherwise agreed upon in writing by the Parties.

9. Term and Termination. This MOU may be terminated at any time, for any reason, by either Party, after providing to the other Party a sixty (60) days advance written notice of intent to terminate.

10. No Joint Venture. By execution of this MOU, the Parties are not creating any joint venture, agency, or fiduciary obligations between the Parties. Rather, the Parties are independent contractors and neither Party has any power to bind the other Party for any purpose.

11. Amendments. This MOU may only be amended or modified by a written agreement signed by both Parties.

12. Legal Effect. Each Party acknowledges and agrees that the Binding Provisions (as set forth in Section 21 below are intended to be and shall be legally binding and enforceable. Except for the matters specifically set forth as the Binding Provisions, this MOU (including specifically the Recitals) is not intended to, and does not, create any legally binding obligations or liabilities on the Parties of this MOU

13. Notices. Any notice, request or other communication required or permitted to be given under this MOU must be in writing and will be sent by one of the following means: electronic mail, facsimile transmission, hand delivery or courier to the other Party at the addresses set forth below:

Sealed:	Sealed Inc. Attn: Mr. Andrew Frank 1270 Broadway, Suite 502 New York, NY 10001 Phone: 347-609-3508 Facsimile: 347-983-7557 Email: andy.frank@sealed.com
National Grid:	Niagara Mohawk Power Corporation d/b/a National Grid Mr. Carlos Nouel Director of Alliances and Vendor Strategy National Grid 40 Sylvan Road, Waltham, MA 02451 Phone (781) 907-1785 Email: carlos.nouel@nationalgrid.com

Any such notice, request or other communication shall be deemed to have been duly given or made and to have become effective at the time of receipt thereof if received during normal business hours in the place of receipt, or otherwise at the opening of business on the business day in the place of receipt, immediately following the day of receipt. Notices given hereunder by electronic mail or facsimile will be deemed to have been effectively given the day indicated on the confirmation accompanying the electronic submission or facsimile. Any Party may, by written notice to another Party, change the address to which notices, requests or other communications to such Party are to be delivered.

14. Counterparts. This MOU may be executed in any number of counterparts with the same effect as if each Party had signed the same document. All counterparts shall be construed together and constitute one and the same instrument. This MOU may be executed by delivery of facsimile or electronic signatures.

15. Third Party Beneficiaries. Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

16. Assignment. This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other non-assigning Party, which consent may be withheld at the discretion of the non-assigning Party; *provided*, either National Grid may assign this MOU to one of its Affiliates without notice.

17. No Waiver. Failure by a Party to exercise, or any delay on the part of a Party in exercising, any right, remedy, power or privilege under this MOU shall not operate as a waiver of any such right, remedy, power or privilege. No single or partial exercise of any right, remedy, power or privilege hereunder shall preclude any other or further exercise of the same or of any other right, remedy, power or privilege.

18. Headings. The headings of the Sections of this MOU are inserted for convenience only and do not constitute a part hereof or affect in any way the meaning or interpretation of this MOU.

19. Governing Law. THIS MOU SHALL BE GOVERNED BY, CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO ANY CONFLICTS OF LAWS RULE THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

20. Forum. Any dispute (other than to enforce a judgment) must be brought in state or federal court in New York City, New York; each Party hereby irrevocably waives any right to trial by jury.

21. Entire Agreement. This MOU constitutes the entire understanding between the Parties hereto with respect to the subject matter herein and supersede and cancel any prior written understandings, agreements, representations, warranties, or communications, whether oral or written, between the Parties relating to the subject matter herein.

22. Binding Provisions. The Parties agree that Sections 6, 7, 8, 12 and 19 are legally binding ("Binding Provisions").

23. Definitions. For purposes of this MOU, the following capitalized terms shall have the following meanings:

"Affiliate" shall mean, when used with respect to a specified Person at any time, any other Person that directly or indirectly, through one or more intermediaries, Controls, is Controlled by, or is under common Control with, such specified Person at such time.

"Control" shall mean, when used with respect to any specified Person, (i) the possession, directly or indirectly, of the power or authority to direct or cause the direction of the management and policies of such specified Person (which, in the case of a publicly traded master limited partnership, means such power or authority with respect to the general partner thereof), whether through the ownership of voting securities, as a trustee, by contract, or otherwise, or (ii) the ownership of more than 50% of the voting ownership interest in such specified Person.

"Person" shall mean any natural person, firm, individual, corporation, business trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.

[*Signatures are on the following page.*]

This MOU is agreed to by the Parties as of the Effective Date.

Sealed Inc.

By: _____
Name: Andrew Frank
Title: Founder and President

Niagara Mohawk Power Corporation d/b/a National Grid

By: _____
Name: Edward H. White Jr.
Title: Vice President

Appendix F

MEMORANDUM OF UNDERSTANDING

NY REV DEMONSTRATION PROJECT

This Memorandum of Understanding (this "MOU") is effective as of June 30th, 2015 ("Effective Date"), by and between Silver Spring Networks, Inc., a Delaware corporation ("Silver Spring") and Niagara Mohawk Power Corporation d/b/a National Grid, a New York corporation ("National Grid" or "Company"). Each referred to herein as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, on February 26, 2015, the New York Public Services Commissions (NYPSC) issued a Reforming the Energy Vision order ("REV Order") adopting a regulatory policy framework and implementation plan; and

WHEREAS, National Grid and Silver Spring seek to collaborate their efforts in order to conduct demonstration projects to animate the energy markets and bring new solutions to customers as required by the REV Order in collaboration with Silver Spring; and

WHEREAS, the Parties would demonstrate and test new energy pricing plans as well as the adoption of distributed energy resources for customers in Clifton Park, New York ("Project"); and

WHEREAS, the objective of the Project is to demonstrate new business models, new approaches, and new technologies through thoughtful innovation, measurement, and verification, in partnership with appropriate technical, business, and academic stakeholders; and

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, The Company and Name of the Silver Spring have the following understanding:

1. Purpose The purpose of this MOU is to set forth the Parties' mutual understanding of the:

(a) roles and responsibilities of each Party in regards to the design and implementation of the Reforming Energy Vision (REV) demo project in Clifton Park,

(b) intent of the Parties with respect to working together to execute Project; and

(c) scope of work of the Project

2. Project. The Parties agree to work together to execute the Project.

(a) Responsibilities of National Grid:

(i) To be set forth in the "Proof of Concept Agreement," a non-binding proposed version of which is attached as Exhibit A

(b) Responsibilities of Silver Spring:

(i) To be set forth in the Proof of Concept Agreement.

3. Resources. The Parties agree to allocate the necessary technical and business resources for the implementation of the Project in a timely manner. National Grid agrees to allocate one (1) Program Manager and an appropriate team which will be under the direction of National Grid. Silver Spring agrees to allocate an appropriate team which shall be under the direction of the Silver Spring.

4. Equipment and Financial Contributions. The Parties will cooperate to identify the specific equipment needed and each Party's financial contributions needed for the successful implementation and completion

of Project. Specifically, National Grid will make the financial contribution set forth in Proof of Concept Agreement unless the project referenced in the Proof of Concept Agreement is not approved, in part or in whole, by the NYPSC.

5. Execution of Definitive Agreements. The Parties will continue to cooperate after the execution of this MOU to establish a definitive agreement that will govern the relationship within sixty (60) days after the Company receives NYPSC approval to move forward with the Project.

6. Confidential Information and Publicity. The Parties' obligations with respect to Confidential Information shall be governed by a Non-Disclosure Agreement to be executed by the Parties.

7. Costs. All costs and expenses incurred by a Party in connection with the Project, including, without limitation, the negotiation and execution of this MOU, any due diligence review and/or the negotiations related to the Project, shall be borne solely by the Party that incurred such costs or expenses, unless otherwise agreed upon in writing by the Parties.

8. Term and Termination. This MOU may be terminated at any time, for any reason, by either Party, after providing to the other Party a sixty (60) days advance written notice of intent to terminate.

9. No Joint Venture. By execution of this MOU, the Parties are not creating any joint venture, agency, or fiduciary obligations between the Parties. Rather, the Parties are independent contractors and neither Party has any power to bind the other Party for any purpose.

10. Amendments. This MOU may only be amended or modified by a written agreement signed by both Parties.

11. Legal Effect. Each Party acknowledges and agrees that the Binding Provisions (as set forth in Section 21 below are intended to be and shall be legally binding and enforceable. Except for the matters specifically set forth as the Binding Provisions, this MOU (including specifically the Recitals) is not intended to, and does not, create any legally binding obligations or liabilities on the Parties of this MOU

12. Notices. Any notice, request or other communication required or permitted to be given under this MOU must be in writing and will be sent by one of the following means: electronic mail, facsimile transmission, hand delivery or courier to the other Party at the addresses set forth below:

Silver Spring:
Silver Spring Networks, Inc.
555 Broadway
Redwood City, CA 94063
Attn: CEO
Phone: 650-839-4000 x5099
Facsimile:
Email: tshay@silverspringnet.com
with copy to: General Counsel at address above

National Grid:
Niagara Mohawk Power Corporation d/b/a National Grid
Mr. Carlos Nouel
Director of Alliances and Vendor Strategy
National Grid
40 Sylvan Road, Waltham, MA 02451
Phone: (781) 907-1785
Facsimile:
Email: carlos.nouel@nationalgrid.com

Any such notice, request or other communication shall be deemed to have been duly given or made and to have become effective at the time of receipt thereof if received during normal business hours in the place of receipt, or otherwise at the opening of business on the business day in the place of receipt, immediately following the day of receipt. Notices given hereunder by electronic mail or facsimile will be deemed to have been effectively given the day indicated on the confirmation accompanying the electronic submission or facsimile. Any Party may, by written notice to another Party, change the address to which notices, requests or other communications to such Party are to be delivered.

13. Counterparts. This MOU may be executed in any number of counterparts with the same effect as if each Party had signed the same document. All counterparts shall be construed together and constitute one and the same instrument. This MOU may be executed by delivery of facsimile or electronic signatures.

14. Third Party Beneficiaries. Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

15. Assignment. This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other non-assigning Party, which consent may be withheld at the discretion of the non-assigning Party; *provided*, either National Grid may assign this MOU to one of its Affiliates without notice.

16. No Waiver. Failure by a Party to exercise, or any delay on the part of a Party in exercising, any right, remedy, power or privilege under this MOU shall not operate as a waiver of any such right, remedy, power or privilege. No single or partial exercise of any right, remedy, power or privilege hereunder shall preclude any other or further exercise of the same or of any other right, remedy, power or privilege.

17. Headings. The headings of the Sections of this MOU are inserted for convenience only and do not constitute a part hereof or affect in any way the meaning or interpretation of this MOU.

18. Governing Law. THIS MOU SHALL BE GOVERNED BY, CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO ANY CONFLICTS OF LAWS RULE THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

19. Forum. Any dispute (other than to enforce a judgment) must be brought in state or federal court in New York City, New York; each Party hereby irrevocably waives any right to trial by jury.

20. Entire Agreement. This MOU constitutes the entire understanding between the Parties hereto with respect to the subject matter herein and supersede and cancel any prior written understandings, agreements, representations, warranties, or communications, whether oral or written, between the Parties relating to the subject matter herein.

21. Binding Provisions. The Parties agree that Sections 6, 7, 11 and 18 are legally binding ("Binding Provisions").

22. Definitions. For purposes of this MOU, the following capitalized terms shall have the following meanings:

"Affiliate" shall mean, when used with respect to a specified Person at any time, any other Person that directly or indirectly, through one or more intermediaries, Controls, is Controlled by, or is under common Control with, such specified Person at such time.

"Control" shall mean, when used with respect to any specified Person, (i) the possession, directly or indirectly, of the power or authority to direct or cause the direction of the management and policies of such specified Person (which, in the case of a publicly traded master limited partnership, means such power or authority with respect to the general partner thereof), whether through the ownership of voting securities, as a trustee, by contract, or otherwise, or (ii) the ownership of more than 50% of the voting ownership interest in such specified Person.

"Person" shall mean any natural person, firm, individual, corporation, business trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.

[*Signatures are on the following page.*]

This MOU is agreed to by the Parties as of the Effective Date.

Approved by Legal:

Marc Pappalardo

Silver Spring Networks, Inc.

By:

Name: Anthony Shay

Title: VP MASER ACCOUNTS

Niagara Mohawk Power Corporation d/b/a National Grid

By:

Name: EDWARD H. WHITE JR.

Title: VICE PRESIDENT

MEMORANDUM OF UNDERSTANDING

NY REV DEMONSTRATION PROJECT

This Memorandum of Understanding (this "MOU") is effective as of June 25, 2015 ("Effective Date"), by and between Utilidata, Inc., a Delaware corporation ("Utilidata"), and Niagara Mohawk Power Corporation d/b/a National Grid, a New York corporation ("National Grid" or "Company"). Each referred to herein as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, on February 26, 2015, the New York Public Services Commissions (NYPSC) issued a Reforming the Energy Vision order ("REV Order") adopting a regulatory policy framework and implementation plan; and

WHEREAS, National Grid and Utilidata seek to collaborate their efforts in order to conduct demonstration projects to animate the energy markets and bring new solutions to customers as required by the REV Order in collaboration with Utilidata; and

WHEREAS, the Parties would demonstrate and test new energy pricing plans as well as the adoption of distributed energy resources for customers in Clifton Park, New York ("Project"); and

WHEREAS, the objective of the Project is to demonstrate new business models, new approaches, and new technologies through thoughtful innovation, measurement, and verification, in partnership with appropriate technical, business, and academic stakeholders; and

NOW, THEREFORE, in consideration of the mutual covenants set forth herein, the Company and Utilidata have the following understanding:

1. Purpose The purpose of this MOU is to set forth the Parties' mutual understanding of the:

(a) roles and responsibilities of each Party in regards to the design and implementation of the Reforming Energy Vision (REV) demo project in Clifton Park,

(b) intent of the Parties with respect to working together to execute Project;

(c) scope of work of the Project

2. Project. The Parties agree to work together to execute the Project.

(a) Responsibilities of National Grid:

(i) See Statement of Work attached hereto as Exhibit A

(b) Responsibilities of Utilidata:

(i) See Statement of Work attached hereto as Exhibit A

3. Resources. The Parties agree to allocate the necessary technical and business resources for the implementation of the Project in a timely manner. National Grid agrees to allocate one (1) Program Manager and an appropriate team which will be under the direction of National Grid. Utilidata agrees to allocate an appropriate team which shall be under the direction of Utilidata.

4. Equipment and Financial Contributions. The Parties will cooperate to identify the specific equipment needed and each Party's financial contributions needed for the successful implementation and completion of Project. Specifically, Utilidata's financial contribution to the Project will include:

(a) Utilidata's cost for Professional Services and Support – approximately 1/3 of the total project cost – will be paid over time and will only be paid subject to specific energy reduction targets being achieved.

5. Execution of Definitive Agreements. The Parties will continue to cooperate after the execution of this MOU to establish a definitive agreement that will govern the relationship within thirty (30) days after the Company receives NYPSC approval to move forward with the Project.

6. Confidential Information and Publicity. The Parties' obligations with respect to Confidential Information shall be governed by the Non-Disclosure Agreement dated June 26 attached hereto as Exhibit B.

7. Costs. All costs and expenses incurred by a Party in connection with the Project, including, without limitation, the negotiation and execution of this MOU, any due diligence review and/or the negotiations related to the Project, shall be borne solely by the Party that incurred such costs or expenses, unless otherwise agreed upon in writing by the Parties.

8. Term and Termination. This MOU may be terminated at any time, for any reason, by either Party, after providing to the other Party a sixty (60) days advance written notice of intent to terminate.

9. No Joint Venture. By execution of this MOU, the Parties are not creating any joint venture, agency, or fiduciary obligations between the Parties. Rather, the Parties are independent contractors and neither Party has any power to bind the other Party for any purpose.

10. Amendments. This MOU may only be amended or modified by a written agreement signed by both Parties.

11. Legal Effect. Each Party acknowledges and agrees that the Binding Provisions (as set forth in Section 21 below are intended to be and shall be legally binding and enforceable. Except for the matters specifically set forth as the Binding Provisions, this MOU (including specifically the Recitals) is not intended to, and does not, create any legally binding obligations or liabilities on the Parties of this MOU

12. Notices. Any notice, request or other communication required or permitted to be given under this MOU must be in writing and will be sent by one of the following means: electronic mail, facsimile transmission, hand delivery or courier to the other Party at the addresses set forth below:

Utilidata:
Utilidata, Inc.
Mr. Michael Wynne, Controller
245 Chapman Street, Suite 200
Providence, RI 02905
Phone: (401) 383-5800
Facsimile: (401) 383-1468
Email: mwynne@utilidata.com

National Grid:
Niagara Mohawk Power Corporation d/b/a National Grid
Mr. Carlos Nouel
Director of Alliances and Vendor Strategy
National Grid
40 Sylvan Road, Waltham, MA 02451

Any such notice, request or other communication shall be deemed to have been duly given or made and to have become effective at the time of receipt thereof if received during normal business hours in the place of receipt, or otherwise at the opening of business on the business day in the place of receipt, immediately following the day of receipt. Notices given hereunder by electronic mail or facsimile will be deemed to have been effectively given the day indicated on the confirmation accompanying the electronic submission or facsimile. Any Party may, by written

notice to another Party, change the address to which notices, requests or other communications to such Party are to be delivered.

13. Counterparts. This MOU may be executed in any number of counterparts with the same effect as if each Party had signed the same document. All counterparts shall be construed together and constitute one and the same instrument. This MOU may be executed by delivery of facsimile or electronic signatures.

14. Third Party Beneficiaries. Nothing in this MOU is intended or shall be construed to confer any rights or remedies on any Person other than the Parties and their respective successors and permitted assigns.

15. Assignment. This MOU shall inure to the benefit of and be binding upon the Parties' respective successors and permitted assigns. No Party shall assign any of its rights or obligations under this MOU to any Person without the prior written consent of the other non-assigning Party, which consent may be withheld at the discretion of the non-assigning Party; *provided*, either National Grid may assign this MOU to one of its Affiliates without notice.

16. No Waiver. Failure by a Party to exercise, or any delay on the part of a Party in exercising, any right, remedy, power or privilege under this MOU shall not operate as a waiver of any such right, remedy, power or privilege. No single or partial exercise of any right, remedy, power or privilege hereunder shall preclude any other or further exercise of the same or of any other right, remedy, power or privilege.

17. Headings. The headings of the Sections of this MOU are inserted for convenience only and do not constitute a part hereof or affect in any way the meaning or interpretation of this MOU.

18. Governing Law. THIS MOU SHALL BE GOVERNED BY, CONSTRUED AND ENFORCED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF NEW YORK WITHOUT REGARD TO ANY CONFLICTS OF LAWS RULE THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

19. Forum. Any dispute (other than to enforce a judgment) must be brought in state or federal court in New York City, New York; each Party hereby irrevocably waives any right to trial by jury.

20. Entire Agreement. This MOU constitutes the entire understanding between the Parties hereto with respect to the subject matter herein and supersede and cancel any prior written understandings, agreements, representations, warranties, or communications, whether oral or written, between the Parties relating to the subject matter herein.

21. Binding Provisions. The Parties agree that Sections 6, 7, 11 and 18 are legally binding ("Binding Provisions").

22. Definitions. For purposes of this MOU, the following capitalized terms shall have the following meanings:

"Affiliate" shall mean, when used with respect to a specified Person at any time, any other Person that directly or indirectly, through one or more intermediaries, Controls, is Controlled by, or is under common Control with, such specified Person at such time.

"Control" shall mean, when used with respect to any specified Person, (i) the possession, directly or indirectly, of the power or authority to direct or cause the direction of the management and policies of such specified Person (which, in the case of a publicly traded master limited partnership, means such power or authority with respect to the general partner thereof), whether through the ownership of voting securities, as a trustee, by contract, or otherwise, or (ii) the ownership of more than 50% of the voting ownership interest in such specified Person.

"Person" shall mean any natural person, firm, individual, corporation, business trust, joint venture, association, company, limited liability company, partnership or other organization or entity, whether incorporated or unincorporated, or any governmental entity.

This MOU is agreed to by the Parties as of the Effective Date.

Utilidata, Inc.

By: _____
Name: WILLIAM M. PRATT
Title: SALES EXECUTIVE.

Niagara Mohawk Power Corporation d/b/a National Grid

By: _____
Name: EDWARD H. WHITE JR.
Title: VICE PRESIDENT

Exhibit A: Utilidata / National Grid Statement of Work for Clifton Park VVO Project

1.1 Utilidata-Provided Materials

AdaptiVolt™ Software Licenses

- AdaptiVolt™ Volt/VAR Optimization software and licenses for 11 circuits.

AdaptiVolt™ VVO Controller Hosting Appliance

One (1) AdaptiVolt™ Signal Intelligence Engine Server (2U – 19" rack mountable)

- Operating licenses for all system software components

Utilidata® Line Voltage Monitors

Eleven (11) Utilidata® Line Voltage Monitors (LVM) for deployment at designated locations. Please note that the final LVM count may change based on the actual field conditions.

1.2 Utilidata-Provided Engineering Services

Engineering, design, configuration, assembly and testing services to provide the AdaptiVolt™ system and related equipment.

- Coordination with National Grid to identify installation locations for the Utilidata-provided Line Voltage Monitors
- Integration, configuration, installation assistance and guidance for National Grid based on VVO project best practices
- Installation support, supervision and guidance for all Utilidata-provided equipment
- Field commissioning and start-up support for all Utilidata-provided equipment, as required, up to eight (8) hours per day
- Measurement and Verification (M&V) Analysis Services
    - Analysis of energy savings using Automated CVR Protocol #1 (the "Protocol"), or other analysis method as agreed upon by the parties
    - Coordination with National Grid on design and conduct of experiment, in accordance with methodologies outlined in the Protocol, including definition of reporting metrics

1.3 Utilidata-Provided Engineering Deliverables

- Integration protocol profiles for all Utilidata-provided equipment
- Final M&V Report, including (but not limited to) the following:
    - A full description of the analysis methods and procedures
    - Summary of conservation metrics including:
        - Voltage reductions
        - Energy consumption
        - Graphical representation of the circuit performance
- Files of raw data used for analysis

1.4 National Grid-Provided Materials

The following materials will be provided by National Grid or a specified 3rd Party:

- Communication modems, media and network connectivity for all National Grid and Utilidata-provided equipment, including field, substation and backhaul networks
- Communications-capable on-load tap changer controllers
- Power sources and power for all Utilidata-provided equipment (to be specified in project specifications)
- Miscellaneous hardware and accessories for all National Grid - and Utilidata-provided equipment

1.5 National Grid-Provided Services

The following materials will be provided by National Grid or a specified 3rd Party:

- Safety Training for all Utilidata employees for on-site access and labor
- Installation for all National Grid and Utilidata-provided equipment
- Engineering design of the selected communications telemetry systems
- Configuration of all National Grid -provided field devices, including (but not limited to): substation meters, on-load tap changer controls and communications devices
- Testing of all National Grid -provided communication networks prior to commissioning and start-up of the Utilidata-provided AdaptiVolt™ system
- (Optional) Integration of the AdaptiVolt™ system into EMS/DMS/SCADA
- M&V Support Services

- Coordination with Utilidata on design and conduct of experiment, in accordance with methodologies outlined in the Protocol, including definition of reporting metrics
- Post commissioning operation of the AdaptiVolt™ system in accordance with the defined M&V experiment

1.6 National Grid-Provided Deliverables

The following materials will be provided by National Grid or a specified 3rd Party:

- Location coordinates of proposed Line Voltage Monitor Locations
- Integration protocol profiles for all National Grid -provided equipment and systems
- Configuration settings for all National Grid -provided equipment (as available)
- Asset topology connectivity for all control elements included in the project
- System single-line diagrams
- M&V Deliverables
  - Raw data files for AdaptiVolt™ system operation to Utilidata for analysis purposes
  - Historical energy usage data, feeder data and customer demographic information for all target circuits included in this project
  - Right to use the data anonymously for marketing, research and development and AdaptiVolt™ system improvement
    - Note: Utilidata will not use data publicly for any purpose without prior authorization by National Grid