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

March 11, 2016

VIA ELECTRONIC DELIVERY

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

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

NATIONAL GRID: COMMUNITY RESILIENCE REV DEMONSTRATION PROJECT IN POTSDAM, NEW YORK - IMPLEMENTATION PLAN

Dear Secretary Burgess:

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

Please direct any questions regarding this filing to:

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

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

Respectfully submitted,

/s/ Janet M. Audunson

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

Enc.

cc: Tammy Mitchell, DPS Staff, w/enclosure (via electronic mail)
Marco Padula, DPS Staff, w/enclosure (via electronic mail)
Denise Gerbsch, DPS Staff, w/enclosure (via electronic mail)
Cathy Hughto-Delzer, w/enclosure (via electronic mail)
Melanie Littlejohn, w/enclosure (via electronic mail)
Edward White, w/enclosure (via electronic mail)
Philip Austen, w/enclosure (via electronic mail)
Dennis Elsenbeck, w/enclosure (via electronic mail)
John Monaghan, w/enclosure (via electronic mail)
Clayton Burns, w/enclosure (via electronic mail)
Richard Burns, w/enclosure (via electronic mail)
Pamela Dise, w/enclosure (via electronic mail)
Carol Teixeira, w/enclosure (via electronic mail)
Jason Eno, w/enclosure (via electronic mail)

300 Erie Blvd. West, A-4, Syracuse, New York 13202
T: 315/428-3411 ■ M: 315/401-7891 ■ Janet.Audunson@nationalgrid.com ■ www.nationalgrid.com

Implementation Plan for

Community Resilience REV Demonstration Project

Potsdam, New York

March 11, 2016

Table of Contents

Executive Summary

This Reforming the Energy Vision ("REV") demonstration project, located in the Village of Potsdam, New York, focuses on improving community resiliency during severe weather events. The Village of Potsdam (the "Village" or "Potsdam") is located in central St. Lawrence County, in the North Country region of New York. According to the 2010 US Census, the Village has a permanent population of 9,428 residents. The Village is also home of the State University of New York at Potsdam ("SUNY Potsdam") and Clarkson University. Potsdam's population almost doubles with the universities' academic-year population increase of about 8,000 students. Potsdam and surrounding St. Lawrence County communities have experienced multi-day power outages as a result of summer microbursts and winter ice storms[1] which in turn affects the availability of emergency services.

The impacts of severe weather events in the North Country and elsewhere may be mitigated by the creation of community resilience microgrids. Clarkson University and Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") have embarked on an ambitious project to develop a community resilience microgrid for Potsdam, using the hybrid utility microgrid ownership model and a proposed, new underground network. As described by the New York Energy Research and Development Authority ("NYSERDA"), the hybrid utility model is a microgrid "where the distribution facilities are owned by the utility but at least some of the microgrid's internal Distributed Energy Resources ("DERs") are owned by a non-utility entity."[2]

The Company is undertaking this REV demonstration to develop and test four new utility services, in support of the Potsdam microgrid project, that may be required for the further deployment of hybrid utility microgrids in New York State. The project provides required coordination and aggregation, with novel rate recovery, to enable a financially sustainable multi-customer microgrid business model.

The four new services to be developed and tested in this REV demonstration are:

1) Tiered recovery for new storm-hardened, underground wires;

2) Central procurement for DER;

3) Microgrid control and operations; and

4) Billing and financial transaction services.

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[1] Including the Ice Storm of 1998 which caused over 10,000 downed utility poles and a 100,000 customer outage throughout the North Country

[2] *Microgrids for Critical Facility Resiliency in New York State*, *Final Report*, New York Energy Research and Development Authority ("NYSERDA"), Report Number 14-36, December 2014 ("NYSERDA Microgrids Report"), at p. 112.

Pre-REV Microgrid Development Efforts in Potsdam

Initial conceptual engineering design, equipment specification, and cost analysis for the proposed hybrid utility microgrid in Potsdam are currently underway via funding through the NYSERDA Program Opportunity Notice ("PON") 2715 - Electric Power Transmission and Distribution (EPTD) Smart Grid Program. The project team under the PON consists of representatives from Clarkson University, General Electric, Nova Energy Specialists, and National Grid. In order to advance beyond a conceptual study, the Company seeks to apply a portion of REV demonstration project funds towards an Audit-Grade Detailed Engineering Design for the proposed hybrid utility microgrid. This Audit-Grade Detailed Engineering Design will serve as the technical basis from which the above services will be developed.

Demonstration Design & Non-Utility Market Participation

Essential to a REV demonstration project is the ability to test new proposed utility services with customers, stakeholders, and non-utility market participants. With the exception of the construction of the underground wires, National Grid believes the other three services noted above may also be provided by non-utility market participants. For practical reasons, the Company believes it is best positioned to provide these services to facilitate the development of community resilience microgrids through the hybrid utility microgrid business model—partnering with technology companies, where necessary, to leverage their expertise. However, National Grid's demonstration project design includes an iterative process for parties to evaluate the Company's proposed contractual and tariff terms as they develop. This will enable the Potsdam stakeholders to compare the Company's proposed services against any that non-utility entities might provide. Included in National Grid's pricing will be utility service fee revenues and appropriate return on invested capital.

"Go/No-Go" Test

The culmination of this REV demonstration project will be final "Go/No-Go" determinations by the proposed Potsdam microgrid customers and community leaders to determine which of the four services they wish to accept from National Grid. The Company believes that results will not only inform future decisions internally, but those of peer utilities, policy makers, and regulators. If any or all of the four hybrid utility microgrid services are deemed a "Go," they will include binding agreements from each of the participating parties.

Costs and Schedule

This REV demonstration project is estimated to cost $1,606,000 in incremental operating expense over the two-year duration. The key milestones include the completion of the conceptual design expected in June 2016, the completion of preliminary service agreements and pricing expected in November 2016, and the final "Go/No-Go" determinations for each of the four proposed services expected in June 2017. Additional details are provided in the Work Plan and Budget Section of this Implementation Plan.

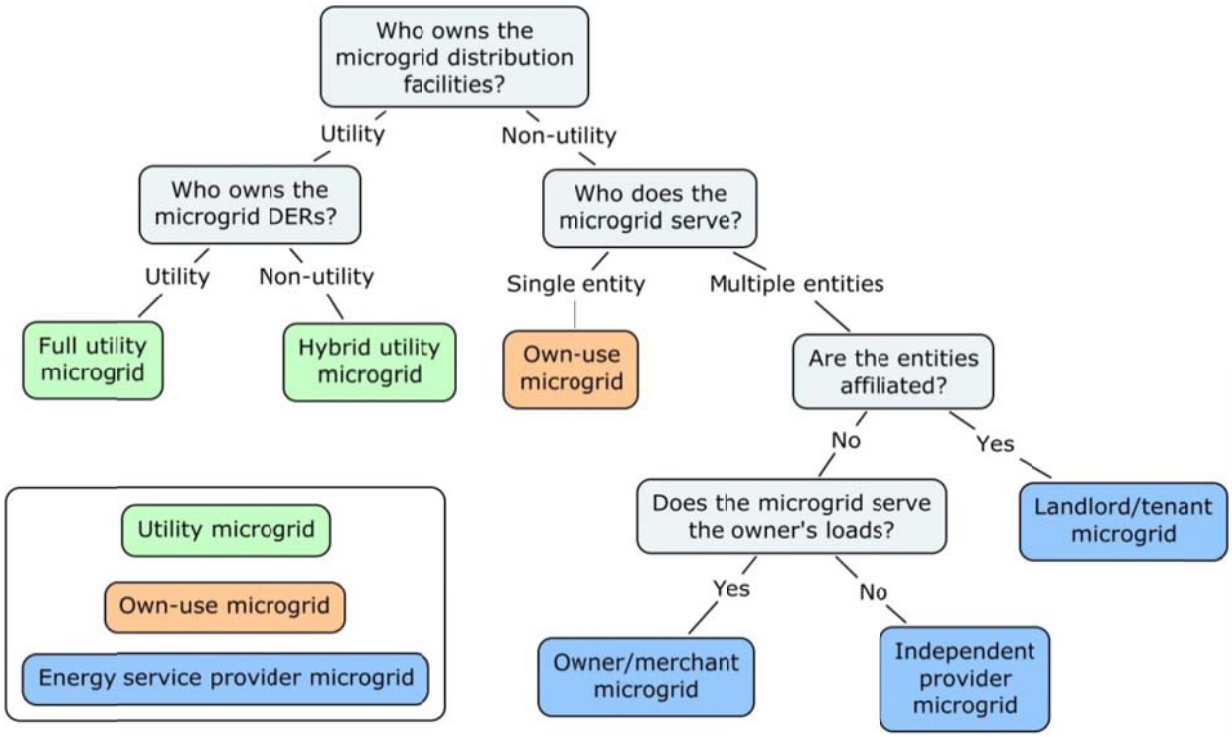
Post-Demonstration Schedule and Activities

Services which are deemed a "Go" will be implemented after the REV demonstration project during the construction phase for the hybrid utility microgrid. A formal evaluation plan for assessing the effectiveness of the services during microgrid operation will be proposed in the quarterly report to the New York Public Service Commission ("Commission") following the results of the final "Go/No-Go" meeting. Microgrid services that are a "Go" may become commercial offerings available to other communities interested in pursuing a hybrid utility microgrid model, depending on the results of the operation evaluation plan.

Demonstration Design

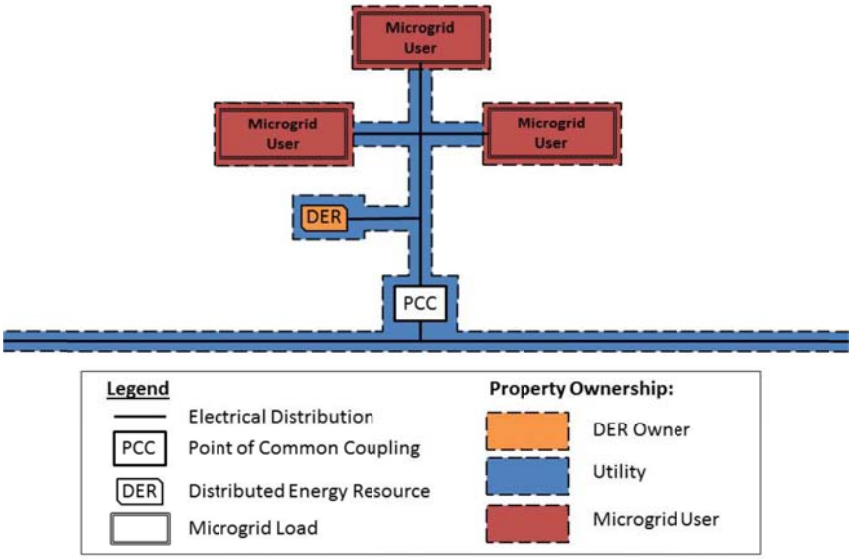
Over the course of this REV demonstration project, the Company will develop and test four new utility services, in support of the Potsdam microgrid project, that may be required for the further deployment of other hybrid utility microgrids in New York State.

This hybrid utility microgrid model[3] was chosen for the community resilience microgrid project in Potsdam using the following decision tree:[4]



[3] *See* NYSERDA Microgrids Report, *supra* note 2.
[4] *Id*., at p. 109.

A simplified version of the hybrid utility microgrid model is depicted in the figure below:[5]



The four new services to be developed and tested in this REV demonstration are:

1) Tiered recovery for new storm hardened, underground wires;

2) Central procurement for DER;

3) Microgrid control and operations; and

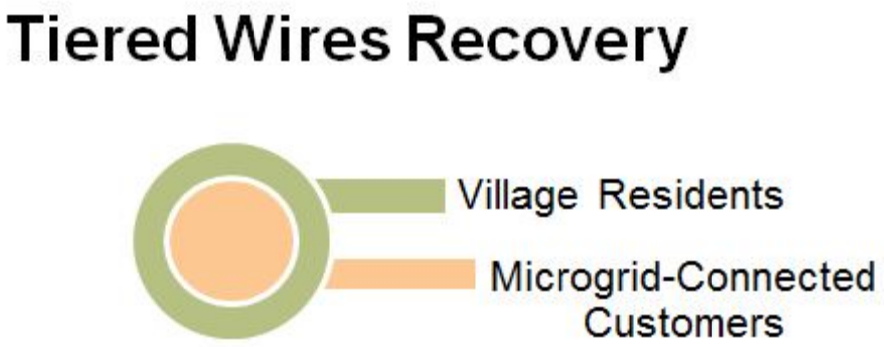
4) Billing and financial transaction services.

1. Tiered recovery for storm-hardened, underground wires

The proposed Potsdam hybrid utility microgrid includes new underground distribution infrastructure capable of withstanding the impacts of severe storms in ways that overhead distribution infrastructure cannot. National Grid believes this component distinguishes the proposed Potsdam system from many other microgrid projects in development in New York State. Given existing franchise rights for distribution assets that cross a public right of way, the Company believes it is the preferred entity to construct, own, and operate this proposed underground network. In order to pay for

[5] *Id.,* Figure 7-6, at p. 113; note that this diagram has been simplified to only show DER assets sited on the utility side of the customer meter. In actually all existing DER assets for this proposed REV demonstration project in Potsdam are sited on the customer side of the meter. This REV demonstration project only concerns itself with siting new, incremental, shared DER assets on the utility side of the customer's meter through use of a central procurement model.

the additional underground wires, the Company proposes a storm-hardening service to be available to potential hybrid utility microgrid customers. Rather than use the traditional rate base approach to pay for this infrastructure investment, the Company proposes a cost allocation model with tiers of cost-sharing based on the customer's level of benefit. The following diagram depicts a conceptual model where those customers physically connected to the microgrid pay for the greatest portion of the wires investment costs, while the group of customers who live within the Village of Potsdam (without being connected to the microgrid) benefit from added community resiliency and therefore pay a smaller portion of the wires investment costs.



Much like the process of traditional ratemaking where the utility's capital costs are recovered at varying proportions across different customer classes, the Company proposes that both direct beneficiaries of the microgrid (those physically connected) and indirect beneficiaries (those who benefit from the availability of critical services enabled by the microgrid, i.e., the residential community at large) may contribute to the utility's cost recovery for the storm-hardened underground wires. The capital cost of the wires investment would be amortized over the life of the wires. The amortized rate provides an annual revenue requirement for the wires, which would then be recovered from the aforementioned microgrid customer classes. At present the capital cost of the underground network is estimated to range between $9.5 Million and $12 Million. However, this estimate is based on Conceptual Design work that remains in progress and may change substantially as the design is refined.

National Grid proposes that microgrid-connected customers will bear the majority of costs for the annual revenue requirement. The remaining minority share of the annual revenue requirement may be socialized to the Village residents. Total cost and the extent of Village government support, on behalf of its constituency, will inform the optimal approach to residential cost-sharing. The Company believes that it is appropriate to consider residential cost-share as it is the residential community at-large that will benefit from the availability of critical services enabled by the microgrid.

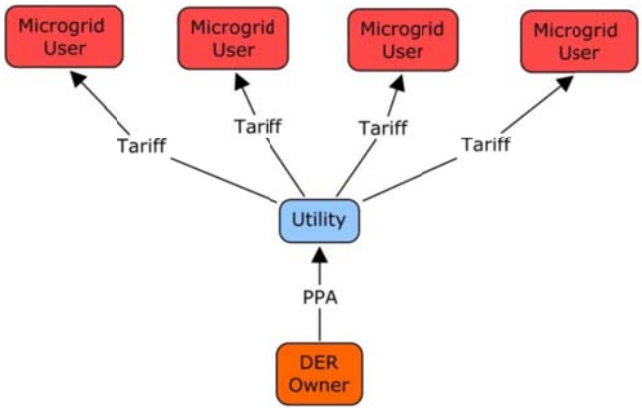
The recovery mechanism for this allocation of costs will be further developed through the REV demonstration project. A distribution surcharge, a revised or new standby rate, or other cost recovery mechanism will be proposed at the Preliminary Service Proposals & Pricing checkpoint and at the final Completion of Financial/Business Plan checkpoint. If the cost recovery mechanism proposal receives the support of the microgrid stakeholders the Company would file a corresponding tariff proposal with the Commission.

2. Central Procurement for DER

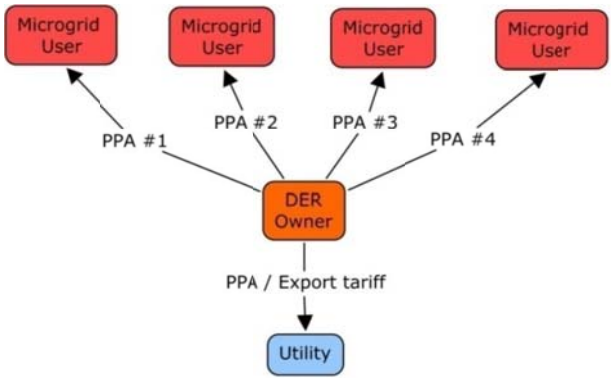
National Grid envisions that the DER required to successfully island the proposed microgrid in Potsdam will include both existing, and potentially new, customer-owned DER (i.e., DER that are sited on the customer's side of the utility meter). Microgrid-connected customers may independently adopt some amount of new DER for which there is a positive return on investment. However, initial indications suggest that an incremental 4 MW of synchronous generation may be required to supply the critical loads in the proposed Potsdam hybrid utility microgrid.[6] In order to ensure that the required incremental DER is developed in Potsdam, National Grid proposes "backstopping" this supplemental DER through central procurement of DER. The Company would serve as the central purchaser of energy output from new DER under a long-term tariff, to ensure that the new DER capacity is developed. In using this model, one may think of the Company as serving as the microgrid DER provider (purchaser) of last resort. Additionally, National Grid does not propose to own the DER asset, but rather proposes buying the energy output from third-party owner(s).

[6] Conceptual design study in process, led by Clarkson University under NYSERDA PON 2715.

The central procurement model is depicted in the following figure:[7]



The central procurement business model to be tested in this proposed REV demonstration project serves as an alternative to the individual power purchase agreement ("PPA") contracting model as depicted in the following figure:[8]



At present, the individual PPA contracting model would likely be the only viable option for the customers to consider in the absence of this REV demonstration.

[7] NYSERDA Microgrids Report, Figure 7-12, at p. 129, National Grid would propose to employ a long-term tariff rather than a PPA for the DER energy procurement.
[8] *Id*., Figure 7-11, at p. 128.

The Company believes that the central procurement model, as opposed to other non-utility or market-based models such as the individual (bilateral) PPA model, has a number of advantages to bring needed supplemental DERs to the microgrid. These advantages include:

- Increased customer convenience as a result of less time and money spent on bilateral contracting;
- Reduction of customer risk and cost for customers through avoidance of large upfront capital investment as a result of a long-term tariff-based payment plan;
- Risk reduction for DER developers by ensuring a long-term revenue stream via a creditworthy counterparty; and the
- Ability to leverage the utility's unique ability to propose new tariffs.

Included in the tariff will be a modest surcharge for utility revenue for providing this service.

3. Microgrid control and operations

A microgrid, like the bulk power grid, requires some form of centralized control, dispatch and operations. While the New York Independent System Operator ("NYISO") and utility transmission operators have their clear roles within the bulk power system, a similar paradigm does not yet exist for hybrid utility microgrids. The Company proposes creating a microgrid control and operations service to address the control, dispatch and operations requirements for a microgrid. National Grid expects to offer these services to microgrid customers with the help of leading-edge technology partners, pairing the utility's broad operational skill sets with the deeper expertise of technology companies specializing in this emerging market. Contracts for microgrid control and operations will include new utility revenue in the form of service fees.

4. Billing and financial transaction services

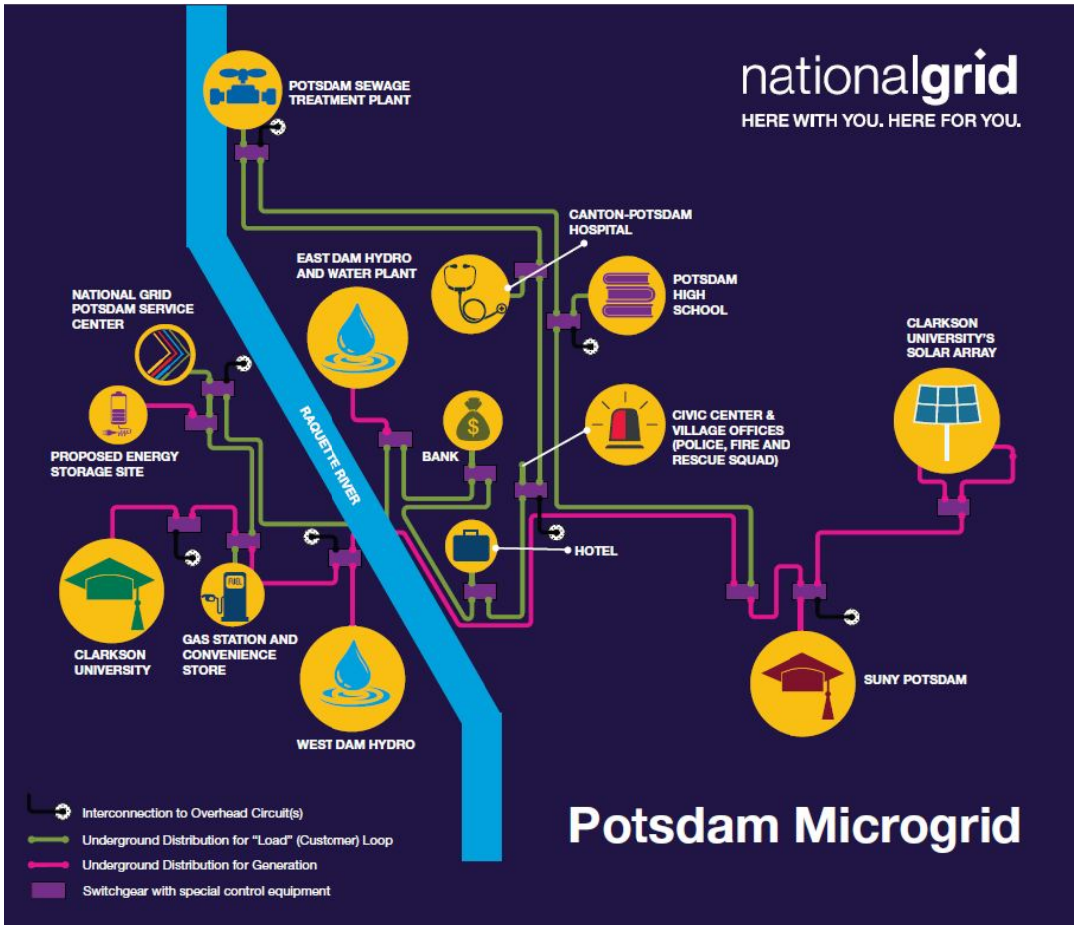
The compensation for existing customer-sited DER, as well as any new utility-sited DER, requires metering hardware for recording usage, a billing engine to calculate a customer's required payment, and a means to execute a bill and collect payment. While a third-party service provider could offer these services to microgrid participants, these services are largely duplicative of the ones that National Grid provides today for its customers. Through a similar arrangement to the one proposed here, the Company presently offers consolidated utility billing service to energy services companies ("ESCOs"). The Company proposes offering a similar service for microgrid customers in

order to facilitate the required microgrid billing and financial transactions between microgrid generators and microgrid loads. This service would also include new utility revenue in the form of service fees.

Pre-REV Microgrid Development Efforts in Potsdam

Initial conceptual engineering design, equipment specification, and cost analysis for the proposed hybrid utility microgrid in Potsdam are currently underway via NYSERDA PON 2715. The project team consists of representatives from Clarkson University, General Electric, Nova Energy Specialists, and National Grid. In order to advance beyond a conceptual study, the Company seeks to apply a portion of REV Demonstration funds towards an Audit-Grade Detailed Engineering Design for the microgrid. This Audit-Grade Detailed Engineering Design will serve as the technical basis from which the four microgrid services, 1) Tiered recovery for new storm hardened, underground wires; 2) Central procurement for DER; 3) Microgrid control and operations; and 4) Billing and financial transaction services, will be developed.

Below is an infographic of the initial mockup of the microgrid:[9]



Demonstration Design & Non-Utility Market Participation

Essential to a REV demonstration project is the ability to test new proposed utility services with customers, stakeholders, and non-utility market participants. With the exception of the construction of the underground wires, National Grid believes the other three services noted above may also be provided by non-utility market participants. For practical reasons, the Company believes it is best positioned to provide these services to facilitate the development of community resilience microgrids through the hybrid utility microgrid business model—partnering with technology companies, where necessary, to leverage their expertise. However, the Company's demonstration project design

[9] Infographic based on the conceptual design detailed in Clarkson University's NYSERDA PON 2715 application, February 12, 2014.

includes an iterative process for parties to evaluate the Company's proposed contractual and tariff terms as they develop. This will enable the Potsdam stakeholders to compare the Company's proposed services against any that non-utility entities might provide. Included in the Company's pricing will be utility service fee revenues and appropriate return on invested capital.

"Go/No-Go" Test

The culmination of the REV demonstration project will be final "Go/No-Go" determinations by the proposed Potsdam microgrid customers and community leaders, to determine which of the four services they wish to accept from National Grid.[10] The Company believes that results will not only inform future decisions internally, but those of peer utilities, policy makers, and regulators. If any or all of the four hybrid utility microgrid services are deemed a "Go," they will include binding agreements from each of the participating parties.

[10] Additional details regarding the "Go/No-Go" determinations can be found in the Test Scenario section of this Implementation Plan.

Test Statements

This REV demonstration project aims to demonstrate new utility services to help overcome commercial barriers to the development of multi-customer hybrid utility microgrids. The predominant microgrid model today is a single-customer model, serving clusters of buildings on a single campus (e.g., corporate, military, or university). Multi-customer microgrids require a substantially higher degree of coordination, due to the required aggregation and optimization of customer load and DER, with a financial structure that appropriately shares the burden of incremental cost and benefit. This demonstration project seeks to test utility services that provide the required coordination and aggregation, with novel rate recovery, to enable a financially sustainable multi-customer microgrid business model. The demonstration can be summarized by a single overarching test statement, below.

Overarching Test Statement	**If…**	**Then…**
The utility can effectively enable a community resilience microgrid through the design of hybrid utility microgrid services that allocate incremental costs primarily to those who benefit from the services.	**Hypothesis 1:** National Grid's proposed microgrid services can enable more convenient, effective backup service for critical facility loads (vs. individual facility backup options), at a modest incremental cost to current service costs	Prospective microgrid-connected customers and other stakeholders will support the continued development of National Grid's proposed microgrid services at specified demonstration checkpoints
	Hypothesis 2: National Grid's proposed utility microgrid services offer higher value than any comparable services available to Potsdam customers from non-utility market participants	Prospective microgrid-connected customers and Village residents (not connected to the microgrid) will agree to service scope and pricing

Prospective microgrid customers and stakeholders will be able to continuously evaluate Hypothesis 1 using the best-available information, including both conceptual design results and the Company's preliminary service proposals and pricing, once available. Parties will evaluate Hypothesis 2 at the end of the demonstration, with final "Go/No-Go" determinations for each of the four proposed utility services:

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

The following supporting test statements allow for a more focused evaluation of the four proposed services in the demonstration:

Supporting Test Statements	**If…**	**Then…**
Proposed service 1: A tiered cost allocation can recover a majority of incremental distribution infrastructure costs from prospective microgrid customers and beneficiaries	Infrastructure will enable critical load customers to operate for up to two (2) weeks after a prolonged outage event	Those customers will see improved business continuity and ability to provide critical emergency services
	A tiered approach allocates the utility's revenue requirement proportionally to those who receive value of business continuity, emergency services and restoration benefit	Required stakeholders will agree to tiered recovery tariff terms that correspond to the anticipated value
Proposed service 2: A utility central procurement model for DER can enable the development of incremental, cost-effective capacity needed for a multi-customer microgrid	National Grid offers a long-term tariff for the purchase of energy from new generation and/or storage capacity, with an associated service fee	This model will overcome the barriers of time/effort and capital/cost encountered in bilateral contracting for the required incremental DER capacity
		Prospective microgrid customers and other beneficiaries will bear any above-market costs associated with the new generation (if required)

Supporting Test Statements	If…	Then…
Proposed service 3: The utility is well-suited for the control and operations of a hybrid utility microgrid	National Grid offers microgrid control and operations service (maintaining frequency, voltage, and power quality) with an associated service fee	Prospective microgrid customers and stakeholders will select National Grid as the most qualified and cost-effective entity to provide this service
Proposed service 4: Current utility capabilities offer the optimal solution for hybrid utility microgrid billing and financial transaction services	National Grid leverages existing utility services including metering, billing, credit and collections for microgrid customers, with an associated service fee	Prospective microgrid customers and stakeholders will select National Grid as the most qualified and cost-effective company to provide this service

Test Population

The Village of Potsdam is located in central St. Lawrence County, in the North Country region of New York. According to the 2010 US Census, the Village has a permanent population of 9,428 residents, of which half live in households with incomes below $40,000.[11] The Village is also the home of SUNY Potsdam and Clarkson University. Potsdam's population almost doubles with the universities' academic-year population increase of approximately 8,000 students.

Potsdam and surrounding St. Lawrence County communities have experienced multi-day power outages as a result of summer microbursts and winter ice storms. These multi-day power outages in turn affect the availability of emergency services such as emergency responders, medical facilities, and others. With this REV demonstration project, National Grid aims to work with commercial customers, including private businesses, universities, and municipal facilities, to test community willingness to pay for increased resiliency, bringing 21st century solutions to combat the effects of 21st century storms.

The Company has identified interested participants in the roles of microgrid-connected critical load customers and participating generators. With resiliency and availability of emergency services to the residential community-at-large enabled by a microgrid, a group of indirect beneficiaries have been identified as well.

Prospective Microgrid-Connected Customers

Prospective microgrid-connected customers include the following "critical load" customers:

- Universities
    - SUNY Potsdam
    - Clarkson University
- Village of Potsdam Municipal Buildings
    - Police Department
    - Fire Department and Civic Center
    - Wastewater Treatment Plant

[11] Internal data.

    - Water Treatment Plant
- Potsdam High School
- The Clarkson Inn
- Canton-Potsdam Hospital
- Stewart's Shops (convenience store and gasoline)
- KeyBank
- National Grid Service Center

These critical load customers would see improved business continuity and ability to provide critical emergency services during an extreme weather event. In light of these benefits, National Grid expects customers physically connected to the microgrid to pay for the greatest portion of the required underground wires investment.

Microgrid Generation Sources

Microgrid generation will come from both existing and new generating sources. Existing generators will participate by opting into tariffs for distributed generation, developed over the course of this demonstration project.

Existing generation sources include:

- Village of Potsdam
    - East Dam Hydro
    - West Dam Hydro
- SUNY Potsdam
    - Combined Heat and Power
- Clarkson University
    - Combined Heat and Power
    - Solar Photovoltaic

New generation sources are expected to be required for the microgrid. Critical load customers will evaluate the business case for independently adding new generation. If this does not yield the required generation to successfully island the microgrid, National Grid will centrally procure DER to ensure the incremental required capacity.

Village of Potsdam Residents

With the envisioned microgrid in place, the Village and surrounding areas will see more certain availability of community and emergency services enabled by the microgrid including banking, grocery, gas, water treatment, waste water treatment, medical services, and police and fire services, among others. Potsdam will also have a greater ability to serve as a regional staging ground for emergency responders and electric restoration crews.

In light of the added resiliency from the hybrid utility microgrid, the Company expects that Village residents will agree to pay an additional share of the total costs. This approach to residential cost share will be determined both by the total cost of the annual revenue requirement as well as by the level of support from the Village government (speaking on behalf of its constituency).

Test Scenarios

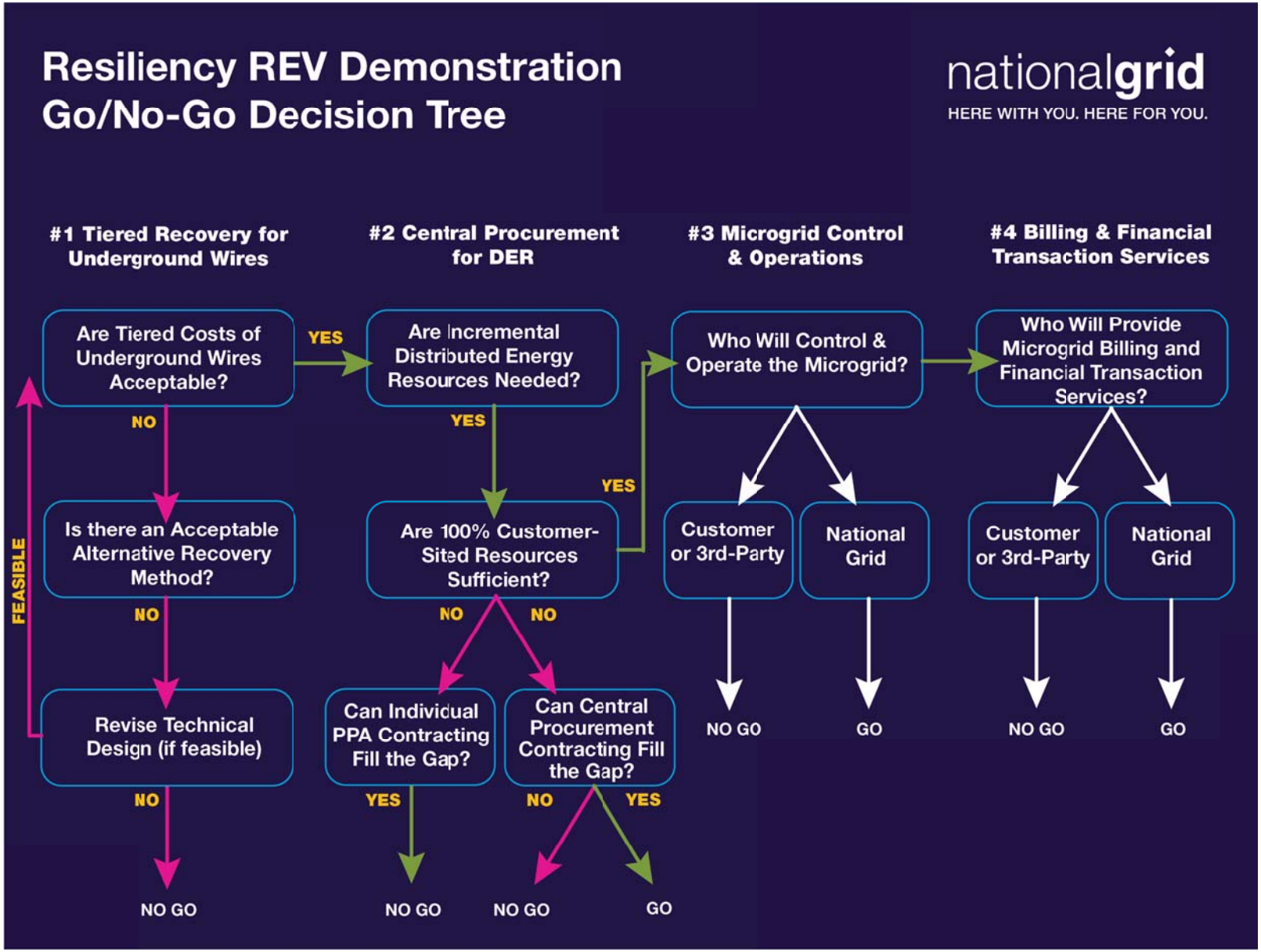
Essential to a REV demonstration project is the ability to test new proposed business arrangements with customers, stakeholders, and non-utility market participants. Other REV demonstration projects may seek to prove the value of a new product or service through "market tests" with a sizable number of customers, employing formal experimental design principles such as the use of a control group. The proposed utility demonstration in Potsdam does not lend itself to quite the same approach, since the community in Potsdam is proposing to undertake one microgrid development process (rather than two), and the natural complexity of the undertaking introduces a significant number of variables. However, National Grid believes that a structured project approach can foster concrete learnings from the demonstration, not only at the end (with final "Go/No-Go" determinations by participants), but also at key milestones along the way.

The Company proposes to develop and test 4 new services in the demonstration:

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

National Grid envisions that its demonstration will enable a "market test" of these services by allowing prospective customers and stakeholders to compare the Company's proposed services against any services that non-utility entities might provide. With the exception of item 1) above, National Grid believes the other three services could also be provided by non-utility market participants. For practical reasons described earlier in the Demonstration Design section of this Implementation Plan, the Company believes it is best positioned to provide these services (likely in partnership with third-party technology companies or service providers). However, National Grid is also committed to enabling prospective customers to evaluate these utility solutions against other available service providers.

The decision-tree diagram below illustrates the high-level process by which prospective microgrid customers and required stakeholders may reach the final "Go/No-Go" determination for each of the four component services.


Resiliency REV Demonstration
Go/No-Go Decision Tree
nationalgrid
HERE WITH YOU. HERE FOR YOU.
#1 Tiered Recovery for Underground Wires
#2 Central Procurement for DER
#3 Microgrid Control & Operations
#4 Billing & Financial Transaction Services
Are Tiered Costs of Underground Wires Acceptable?
YES
Are Incremental Distributed Energy Resources Needed?
Who Will Control & Operate the Microgrid?
Who Will Provide Microgrid Billing and Financial Transaction Services?
NO
YES
YES
FEASIBLE
Is there an Acceptable Alternative Recovery Method?
Are 100% Customer-Sited Resources Sufficient?
Customer or 3rd-Party
National Grid
Customer or 3rd-Party
National Grid
NO
NO
NO
Revise Technical Design (if feasible)
Can Individual PPA Contracting Fill the Gap?
Can Central Procurement Contracting Fill the Gap?
NO GO
GO
NO GO
GO
NO
YES
NO
YES
NO GO
NO GO
NO GO
GO

Checkpoints/Milestones

There are several points in the proposed REV demonstration, at which prospective microgrid customers and other stakeholders should be able to evaluate National Grid's proposed services against other entities' capabilities, and REV demonstration evaluators should be able to review REV demonstration project results, including:

- **Completion of Conceptual Design** - *Expected June 2016*
    - This will be the point when initial design and cost ranges for new underground wires, controller, existing generation, and new incremental DER (capacity and type), are available to the REV demonstration team.
    - This will be an opportunity for the REV demonstration team to identify any significant modifications to the technical design that would affect the scope of services envisioned in this demonstration project.
    - This will also be the point at which microgrid stakeholders in Potsdam may provide the results of the conceptual design to any other potential partners they wish to compare against National Grid.
- **Preliminary Service Proposals & Pricing** - *Expected November 2016*
    - This will be the point at which National Grid presents its preliminary service proposals and indicative pricing to Potsdam microgrid customers, including proposed cost allocation to prospective connected customers and beneficiaries in the Village.
    - Microgrid stakeholders in Potsdam would then be able to compare these proposals with any available from non-utility entities.
- **Completion of Financial/Business Plan** - *Expected June 2017*
    - This will be the point at which microgrid stakeholders in Potsdam would conclude their evaluation of National Grid's final proposed service agreements and determine whether to execute definitive agreements with National Grid or a non-utility entity (or none at all).[12] This is envisioned to be the final "Go/No-Go" determination for each of the proposed services.

[12] Such agreements may still be contingent on additional conditions, such as the Commission's approval of a proposed National Grid tariff filing, or financial closing by new DER developers.

National Grid notes that the timing of these checkpoints will depend, in part, upon the outcomes of efforts by outside parties, including the conceptual design study led by Clarkson University under the NYSERDA PON.

Check Point	**Description**	
Conceptual Design Completion	Measure	Initial design and cost ranges for new underground wires and controller Definition of critical loads, existing DER, and new DER required (capacity &type) Initial stakeholder engagement and community outreach
	How and When	Expected June 2016, at conclusion of NYSERDA PON study
	Resources	PON study participants REV demonstration project team Initial prospective microgrid customers and stakeholders
	Expected Target	$12M of underground cost 4 MW of incremental DER required 2-week expected microgrid resiliency Interest in tiered recovery tariff from Village and other stakeholders, based on initial engagement and outreach
	Strategy in case of results below expectations	Scale down size of microgrid to reduce underground costs and DER capacity required

Check Point	Description	
Preliminary Service Proposals & Pricing	Measure	Preliminary National Grid service proposals and indicative pricing, reflecting proposed cost allocation from prospective connected customers and beneficiaries in the Village and surrounding areas.
	How and When	Expected November 2016, following initial recovery plan for underground cost and initial tariff design, and reflecting stakeholder feedback to date
	Resources	REV demonstration project team All prospective microgrid customers and relevant stakeholders
	Expected Target	Prospective customer and stakeholder support for continued development
	Strategy in case of results below expectations	Expand allocation pool to include larger utility customer base Explore additional options for community funding Reduce utility service fees Scale down size of microgrid to reduce underground cost and DER capacity required

Check Point	Description	
Completion of Financial/Business Plan	Measure	Final “Go/No-Go” determination for the four new utility services by prospective microgrid customers and stakeholders
	How and When	Expected June 2017, following customer and stakeholder evaluation of National Grid’s final proposed service agreements and pricing
	Resources	REV demonstration project team All prospective microgrid customers and relevant stakeholders
	Expected Target	Positive finding: “Go” determination on multiple utility microgrid services
	Strategy in case of results below expectations	Pursue NY Prize Phase 3 funding for build-out and construction Identify cost gap and consider socializing costs to all National Grid customers Identify customers who remain interested in resiliency and work on non-microgrid individual resiliency solutions

Project Structure and Governance

Project Team

National Grid: Utility Skill Sets

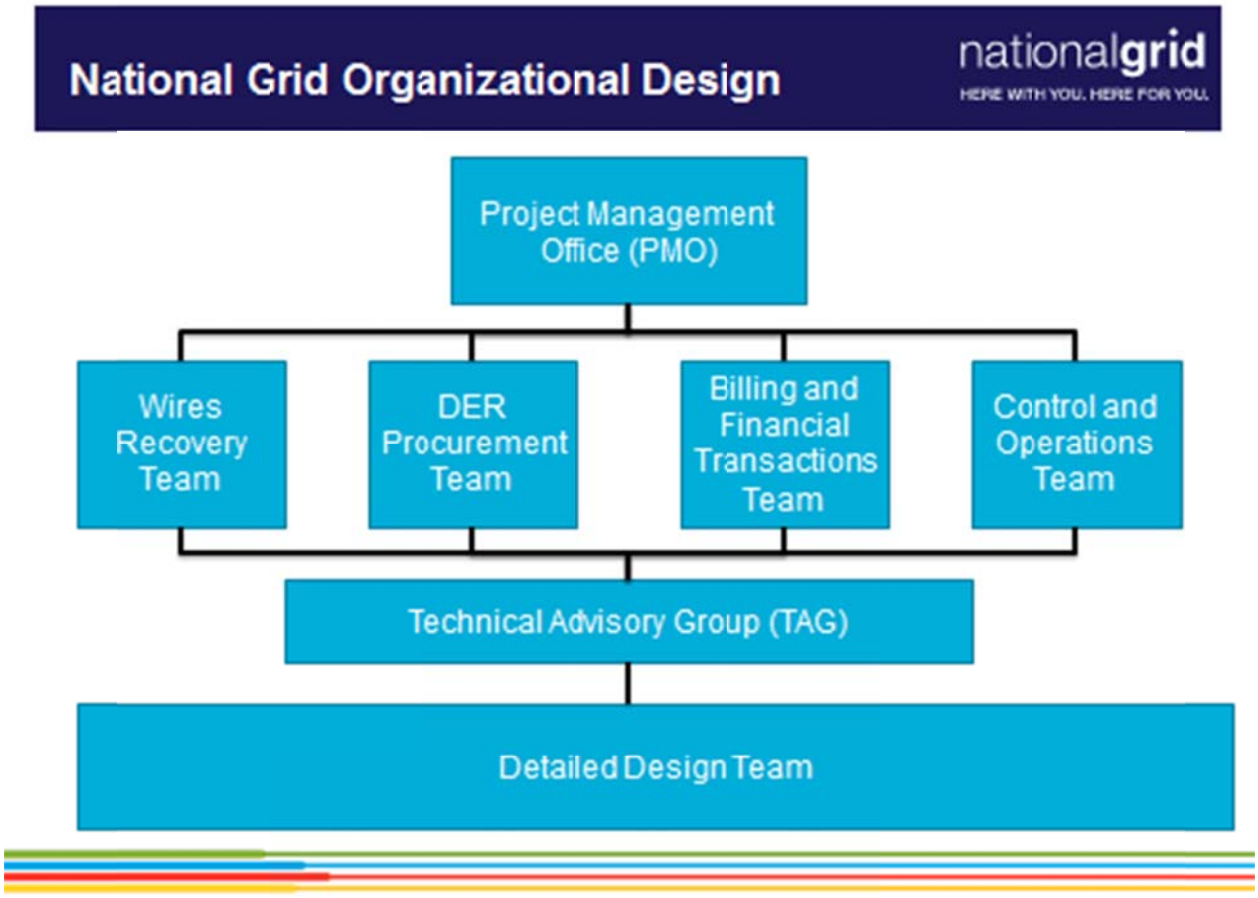
- Engineering
- Tariff Design
- Contracting
- Stakeholder engagement
- Communications, media relations, and marketing to larger community
- Government relations

Partner Skill Sets

- Data analytics
- Stakeholder engagement
- DER asset operation

In light of the skill set requirements, the project will be staffed as follows:

National Grid Project Staff



Project Management Office	
John Monaghan, National Grid Project Manager	John.Monaghan@nationalgrid.com
Janet Audunson, Legal – NY Regulatory	Janet.Audunson@nationalgrid.com
Pamela Dise, NY Pricing & Regulation	Pamela.Dise@nationalgrid.com
Deborah Thoener, Finance and Reporting	Deborah.Thoener@nationalgrid.com
Brian Cronin, Communications: Marketing, Outreach & Education	Brian.Cronin@nationalgrid.com
Dennis Elsenbeck, Stakeholder Engagement	Dennis.Elsenbeck@nationalgrid.com
Rich Burns, Stakeholder Engagement	Richard.Burns@nationalgrid.com
Clayton Burns, Conceptual Design Lead	Clayton.Burns@nationalgrid.com

Carol Teixeira, Wires Recovery Team Lead	Carol.Teixeira@nationalgrid.com
Karsten Barde, DER Procurement Team Lead	Karsten.Barde@nationalgrid.com
Jeff Martin, Billing and Financial Transactions Team Lead	Jeff.Martin@nationalgrid.com
Joseph Farella, Control and Operations Team Lead	Joseph.Farella@nationalgrid.com
TBD, Technical Advisory Group (TAG) Team Lead	TBD
Wires Recovery Team	
Carol Teixeira, Wires Recovery Team Lead	Carol.Teixeira@nationalgrid.com
Darrell Jakubowski, Distribution Engineering and TAG Liaison	Darrell.Jakubowski@nationalgrid.com
DER Procurement Team	
Karsten Barde, DER Procurement Team Lead	Karsten.Barde@nationalgrid.com
TBD, TAG Liasion	TBD
Jason Eno, Tariff Design and Pricing	Jason.Eno@nationalgrid.com
Margaret Janzen, Energy Supply	Margaret.Janzen@nationalgrid.com
Billing and Financial Transactions Team	
Jeff Martin, Billing and Financial Transactions Team Lead	Jeff.Martin@nationalgrid.com
John Maupin, Meter Data Services and TAG Liaison	John.Maupin@nationalgrid.com
Michele Wilder, Billing	Michele.Wilder@nationalgrid.com
Carol Teixeira, Pricing	Carol.Teixeira@nationalgrid.com
Control and Operations Team	
Joseph Farella, Control and Operations Team Lead and TAG Liaison	Joseph.Farella@nationalgrid.com
Carol Teixeira, Pricing	Carol.Teixeira@nationalgrid.com

Technical Advisory Group	
TBD[13], Team Lead	
Clayton Burns, Conceptual Design Lead	Clayton.Burns@nationalgrid.com
Darrell Jakubowski, Distribution Engineering	Darrell.Jakubowski@nationalgrid.com
TBD, Retail Connections Engineering	
John Maupin, Meter Data Services	John.Maupin@nationalgrid.com
Joseph Farella, Control Center	Joseph.Farella@nationalgrid.com
Mukund Ravipaty, Digital Risk and Security	Mukund.Ravipaty@nationalgrid.com
TBD, Information Systems (IS)	
TBD, Telecom Engineering	
TBD, Lab & Test (metering)	
Michael De Matteo, Forecasting and Analytics	Michael.DeMatteo@nationalgrid.com
Babak Enayati, Engineering	Babak.Enayati@nationalgrid.com
Communications Auxiliary Team: Marketing, Outreach and Education	
Brian Cronin, Communications Team Lead	Brian.Cronin@nationalgrid.com
Virginia Limmiatis, Media Relations	Virginia.Limmiatis@nationalgrid.com
Kerry Burns, Strategic Communications	Kerry.Burns@nationalgrid.com
Stakeholder Engagement Auxiliary Team	
Rich Burns, Stakeholder Engagement – Local and Team Lead	Richard.Burns@nationalgrid.com
Dennis Elsenbeck, Stakeholder Engagement – State	Dennis.Elsenbeck@nationalgrid.com
Alberto Bianchetti, Government Relations	Alberto.Bianchetti@nationalgrid.com
Melanie Littlejohn, Executive Director, Community and Customer Management for Upstate NY	Melanie.Littlejohn@nationalgrid.com

[13] Roles where staffing are to-be-determined ("TBD") should be filled by the project's first quarterly report to the Public Service Commission.

Detailed Design Team/Partner Staff[14]

Thomas Ortmeyer, Conceptual Study Project Lead, Clarkson University	tortmeye@clarkson.edu
Jie Li, Electrical Engineering, Clarkson University	jieli@clarkson.edu
Lei Wu, Electrical Engineering, Clarkson University	lwu@clarkson.edu
Philip Barker, Power Distribution Design, Nova Energy	pbarker@novaenergyspecialists.com
Bahman Daryanian, GE Energy Consulting GE Lead for Conceptual and Detailed Design	bahman.daryanian@ge.com
Herman Wiegman, GE Lead for Microgrid Controller Project, GE Global Research	wiegman@ge.com

[14] Additional information as to partner staff and organizational design for external parties will be added after the release of the NY Prize Stage 2 RFP and the subsequent completion of the detailed design scoping process. The detailed design scoping process is expected to require three to four months to complete.

Roles & Responsibilities

Roles and responsibilities in this document focus on the REV demonstration project, and do not fully detail related activities such as the conceptual design study (NYSERDA PON-funded). Subsequent phases of Construction and Ongoing Operation & Maintenance are also not included below.

National Grid REV Demonstration Team

Role / Responsibility	Description
Support conceptual design and lead detailed design	Provide necessary data, and expertise for the distribution design work
Set up REV demonstration project PMO	Create project PMO to assist with coordination of REV Demo, NY Prize, and other grant funded research activities
Initial stakeholder engagement and community outreach	Gather qualitative data and interview stakeholders regarding expectations for the four proposed solutions
Tiered recovery for new storm-hardened, underground wires (capital costs)	Create the tiered recovery model with and without residential cost sharing for the preliminary service proposal milestone
Tariff Design for Central Procurement Contracting (and Tariff, if required)	Create the generation developer RFP and Tariff for needed incremental DERs; use RFP pricing results to inform tariff design
Stakeholder feedback and additional community outreach	Coordinate between technical team and stakeholders on the design work and costs, address affordability and other concerns at each milestone
Draft contracts for “Go/No-Go” meetings with refined tariffs and business cases	Draw up contracts and tariffs based on the results of stakeholder feedback from the preliminary service proposal milestone and additional detailed design results

Microgrid Connected Customers

Role / Responsibility	Description
Conceptual Design	Complete conceptual design study (with GE Consulting and Nova Energy)
Financial and Business Planning, non-utility participants	Solicit interest from possible third-party service providers as alternative to National Grid proposals
Rev Demo Preliminary Services Proposal feedback	Evaluate National Grid preliminary service proposals and pricing, and compare to any third-party alternatives
Complete Financial/Business Plan	Contribute any necessary information or feedback as well as any third-party solicitations
"Go/No-Go" participation	Conduct "Go/No-Go" Determination for National Grid proposed service and execute contracts with National Grid, for services that are a "Go"

Village of Potsdam

Role / Responsibility	Description
Feedback on preliminary services proposal	Evaluate National Grid tariff proposals, as applicable
Represent residential community at-large	Represent residential constituency and serve as customer advocate for potential residential cost share in the tiered recovery of storm-hardened, underground wires
Conduct "Go/No-Go" Determination for National Grid proposed tariffs	Conduct "Go/No-Go" Determination for National Grid proposed service and execute contracts with National Grid, for services that are a "Go"

New York State Department of Public Service/Public Service Commission

Role / Responsibility	Description
Provide feedback on quarterly reports	Review progress against project objectives and recommend any corrective actions
Evaluate National Grid tariff proposals, as applicable	Review tariff proposals or revisions from National Grid
Provide feedback to National Grid on proposals	Recommend adjustments to Company's tariff proposals as needed to achieve demonstration objectives
Approve final tariff proposals	Provide final approval to enact any new tariffs or tariff changes

Governance

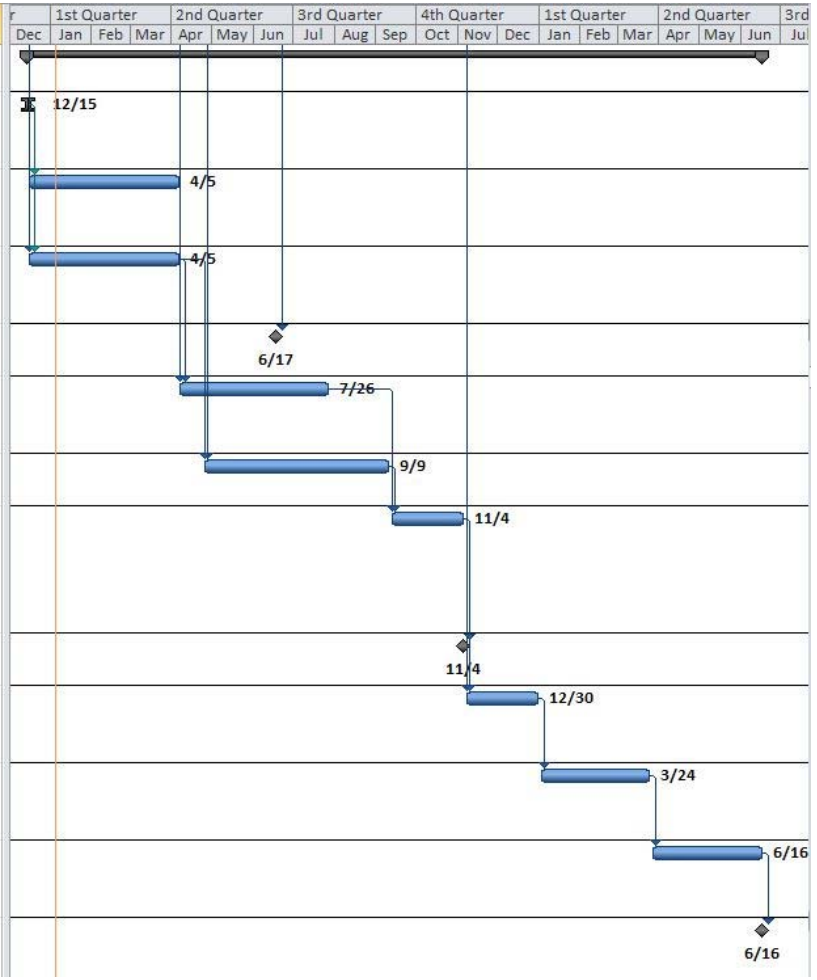
Demonstration Steering Committee	
Utility Participation	**Partner Participants**
Ed White Vice President, New Energy Solutions	Dr. Tom Ortmeyer, Project Lead Clarkson University
Philip Austen Director, Solutions Delivery	Dean William Jemison Clarkson University
John Monaghan Senior Program Manager, Solutions Delivery	James “Tony” DiTullio SUNY Potsdam
Dennis Elsenbeck Director, Stakeholder and Policy Engagement	Mayor Ron Tischler Village of Potsdam
Melanie Littlejohn Executive Director, Community and Customer Management for Upstate NY	Bahman Daryanian Technical Director, Smart Power and Power Economics, GE Energy Consulting
	Philip Barker Founder and Principal Engineer, Nova Energy Specialists

Decision Making Logistics	
Meeting Format	**Meeting Frequency**
Conference Calls or In-Person Meetings	Monthly

Monthly conference calls, and in-person meetings at milestone points, to report on project schedule, identified risks, microgrid service development status, and the projected costs and benefits of microgrid services under development.

Work Plan[15]

	Task Name	Duration	Start	Finish	Predecessors
10	**REV Demonstration**	**394 days?**	**Tue 12/15/15**	**Fri 6/16/17**	
11	Demonstration Approval	1 day	Tue 12/15/15	Tue 12/15/15	
12	Set up project PMO	4 mons	Wed 12/16/15	Tue 4/5/16	11
13	Initial stakeholder engagement and community outreach	4 mons?	Wed 12/16/15	Tue 4/5/16	3,11
14	Conceptual Design Complete Milestone	0 days	Fri 6/17/16	Fri 6/17/16	6
15	Initial Engineering Design Recovery Plan (Capital Costs)	4 mons	Wed 4/6/16	Tue 7/26/16	13,4
16	Initial Tariff Design (Commodity Costs)	5 mons	Mon 4/25/16	Fri 9/9/16	5,13
17	Stakeholder feedback on initial cost estimates and recovery/payment plan & additional community outreach	2 mons	Mon 9/12/16	Fri 11/4/16	15,16
18	Preliminary Service Proposals & Pricing	0 days	Fri 11/4/16	Fri 11/4/16	17
19	Coordinate and incorporate stakeholder feedback with NY Prize Design Study team	2 mons?	Mon 11/7/16	Fri 12/30/16	17,8
20	Revise tariffs based on possible changes to NY Prize technical study	3 mons?	Mon 1/2/17	Fri 3/24/17	19
21	Draft contracts for Go/No-Go meeting with refined tariffs and business cases	3 mons	Mon 3/27/17	Fri 6/16/17	20
22	Financial/Business Plan & Contracting ("Go/No-Go")	0 days	Fri 6/16/17	Fri 6/16/17	21



[15] Note that this initial project schedule assumed a December 2015 release for the NY Prize Stage 2 RFP. Detailed design scoping will commence upon receipt of the Stage 2 RFP. It is anticipated that the detailed design scoping process will take three to four months to complete. Upon completion of the detailed design scoping process the project schedule will be updated to reflect any "downstream" scheduling impacts for developing and pricing the microgrid services.

Project Budget

Operating Expenses	Year 1	Year 2	Total
Project Administration and Planning (PMO)	$104,000	$27,000	$131,000
Stakeholder and Community Engagement, Marketing and Communications	$100,000	$100,000	$200,000
Implementation (Including Legal and Economic Modeling Support)	$150,000	$125,000	$275,000
Audit-Grade Detailed Engineering Design of Microgrid	$1,000,000	$0	$1,000,000
Total Incremental Operating Expenses	$1,354,000	$252,000	$1,606,000

Budget and Resources assigned to Project Tasks

	Task Name	Duration	Start	Finish	Pre	Resource Names	Cost	Cost Notes	Funding Source
10	**REV Demonstration**	**394 days?**	**Tue 12/15/15**	**Fri 6/16/17**			**$606,000.00**		
11	Demonstration Approval	1 day	Tue 12/15/15	Tue 12/15/15		Department of Public Service	$0.00		
12	Set up project PMO	4 mons	Wed 12/16/15	Tue 4/5/16	11	John Monaghan	$104,000.00	This includes travel costs for Ngrid Employees for whole project and incremental labor for the PM	REV Demo
13	Initial stakeholder engagement and community outreach	4 mons?	Wed 12/16/15	Tue 4/5/16	3,11	Rich Burns,Virginia Limmiatis,Al Bianchetti,Dennis Elsenbeck	$50,000.00	This includes incremental labor as well as marketing materials, meeting costs, and local outreach to	REV Demo
14	Conceptual Design Complete Milestone	0 days	Fri 6/17/16	Fri 6/17/16	6		$0.00		
15	Initial Engineering Design Recovery Plan (Capital Costs)	4 mons	Wed 4/6/16	Tue 7/26/16	13,4	Carol Teixeira	$75,000.00	Incremental labor and/or external consulting	REV Demo
16	Initial Tariff Design (Commodity Costs)	5 mons	Mon 4/25/16	Fri 9/9/16	5,13	Carol Teixeira	$75,000.00	Incremental labor and/or external consulting	REV Demo
17	Stakeholder feedback on initial cost estimates and recovery/payment plan & additional community outreach	2 mons	Mon 9/12/16	Fri 11/4/16	15,16	Rich Burns,Virginia Limmiatis,Al Bianchetti,Dennis Elsenbeck	$50,000.00	Incremental labor and any community based marketing, outreach and education that is needed	REV Demo
18	Preliminary Service Proposals & Pricing	0 days	Fri 11/4/16	Fri 11/4/16	17		$0.00		
19	Coordinate and incorporate stakeholder feedback with Detailed Design Study team	2 mons?	Mon 11/7/16	Fri 12/30/16	17,8	John Monaghan,Rich Burns,Clay Burns	$27,000.00	Costs reflect PMO expenses in year 2	
20	Revise tariffs based on possible changes to NY Prize technical study	3 mons?	Mon 1/2/17	Fri 3/24/17	19	Carol Teixeria	$50,000.00	If changes to the tariff design are needed then the funds for initial tariff design will also be used here.	REV Demo
21	Draft contracts for Go/No-Go meeting with refined tariffs and business cases	3 mons	Mon 3/27/17	Fri 6/16/17	20	Janet Audunson	$75,000.00	Incremental labor and/or external legal counsel	REV Demo
22	Financial/Business Plan & Contracting ("Go/No-Go")	0 days	Fri 6/16/17	Fri 6/16/17	21	John Monaghan	$100,000.00	Costs include all stakeholder and community engagement as well as marketing and communications	

Reporting Structure:

Quarterly reporting template

Last Project Milestone:

Next Project Milestone:

Completed Project Tasks Since Last Report:

Changes or Impacts to Schedule since Last Report:

Lessons Learned:

Coordination with other work streams: (e.g., NY Prize, Clarkson University research activities, etc.)

Identified Risks:

Risk Mitigation Plan:

Finance

Total Incremental Spend to Date:

Target Incremental Spend:

Actual Incremental Spend:

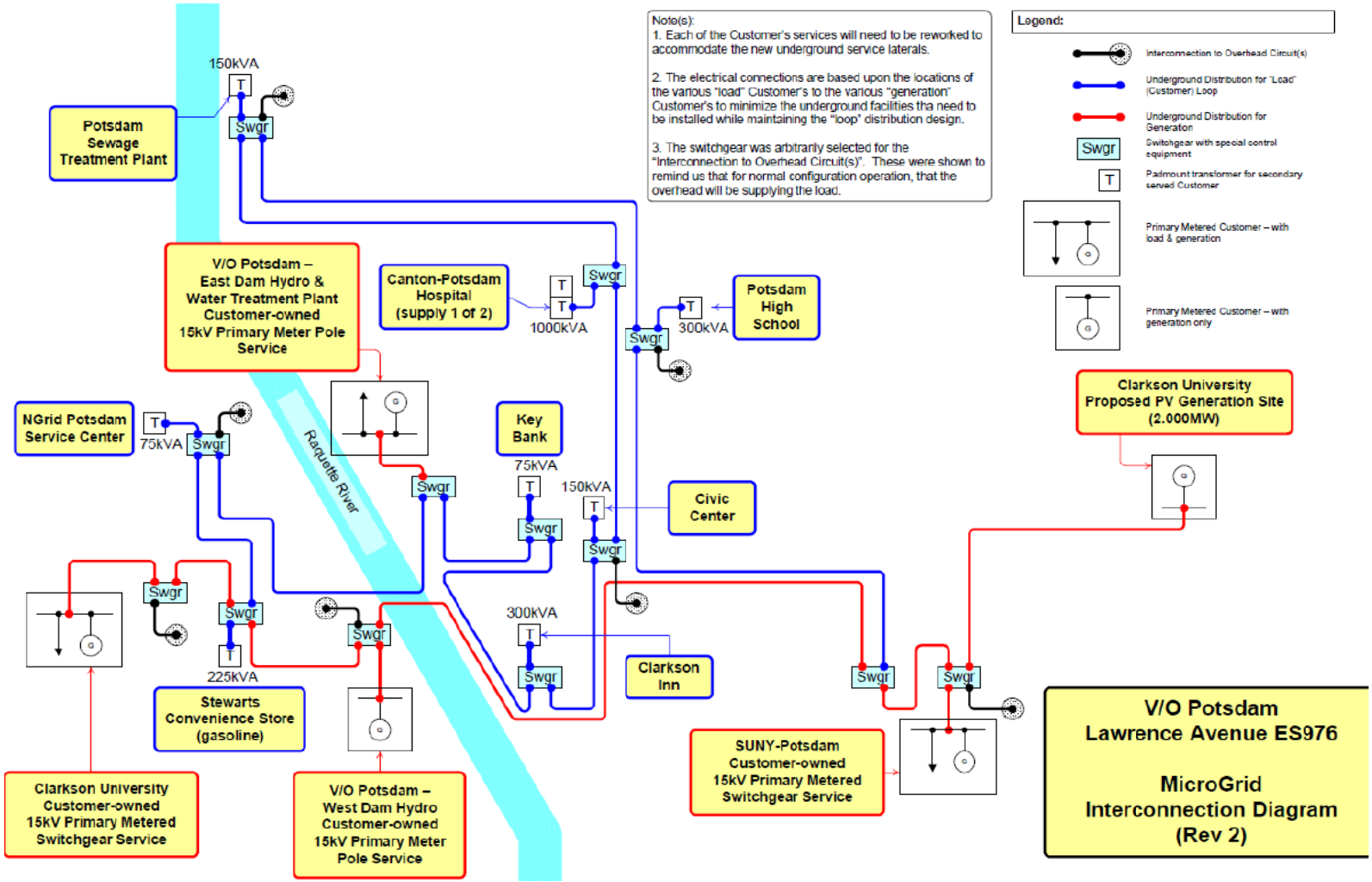
Incremental Spend Variance:

Non-Incremental Spend:

In-kind and grant support (specifically for REV Demo):

Appendix

Figure 1 – Conceptual Microgrid Design



Attachment 1 – Potsdam Engagement/Marketing Plan

Any stakeholder engagement plan should be augmented with Marketing and Communications Development for multiple uses by all stakeholders following a mutually (NG/NY State/County/Town/Village, Officials/ Partners & Vendors) agreed-upon timeline.

Awareness - Leveraging a mix of face-to-face ("F2F"), direct/e-mail, dedicated website, social media, radio, print or out of home (billboard) communications for the first phase should be focused on raising awareness of the microgrid project for all parties involved in development, planning and installation. Approach the communications/key messages/talking points/collateral copy to answer the basic WHAT, WHY, WHEN, WHO & HOW with supporting detail for each outlining the following components:

- Benefits -to/for Community Residents, Businesses & Supporting Partners
- Impacts - to Community/Businesses including Cost/Construction/Service Interruptions
- Cost - Preliminary proposal of how cost will be shared by Utility, Partners, State, and Customers including timing of cost impacts- new rate structure.
- Defined Partners/Roles- Utility, Partners, State, County, Town, Village
- Call to Action – What does each stakeholder NEED to do if anything

Planning – Developing, where appropriate, communications to all stakeholders outlining information related to the current state of planning, design process to keep everyone informed of any changes or additional information either uncovered or inadvertently missed in the initial awareness phase. Keeping all parties informed with a regular communications/engagement will be essential in maintaining transparency which bolsters trust, maintains project momentum and assists in any unforeseen project changes that alter benefits/impacts/costs/timing that may result in negative perceptions or changes in support from any or all stakeholders.

- Calendar of regular communications through face to face, dedicated website, call center talking points, social media, direct/email, bill inserts, radio, billboard and or print

Implementation – With clear timeline developed, milestones should be created with key communications touch points defined to engage all stakeholders via integrated engagement/marketing plan that leverages a mix of similar tactics in awareness/planning with improvements applied to inform all stakeholders:

- Impacts - to Community/Business's including Construction/Service Interruptions
- Call to Action – What does each stakeholder NEED to do if anything through this phase with clear directions on where all can go for additional information (website, dedicated two-way email channel, call centers or any planned F2F meetings)
- Develop a strategy for identifying complaints with a clear expectation of follow up/resolution to mitigate negative sentiment

Activation – A special community-based event and set of communications in coordination with all supporting players announcing the completion of this important project giving special thanks to the community, city, county & state for their cooperation throughout all phases. With a commitment to maintain open communications throughout a mutually agreed upon timeframe to keep all parties informed of:

- System Performance
- System Improvements
- With special communications planned for major storm events:
  - Prior to – inform community of sites serviced by microgrid if outages occur
  - During – supplementing normal storm communications (ETR's) with seeded reminders of where power is still on
  - After – Open and honest communications of system performance, highlighting success's as well as areas of improvements with language of commitment to constant improvement from event to event

Summary - All of the above is a draft plan subject to change with a concentrated effort to update for improvements based on feedback from all parties involved. Communication to all is an essential piece of this project's success and should be treated as an open forum between all to maintain forward momentum and continued support from all stakeholders.