

BEFORE THE
STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

In the Matter of

Niagara Mohawk Power Corporation dba National Grid

Cases 17-E-0238 & 17-G-0239

August 2017

Prepared Exhibits of:

Staff Markets and Energy
Efficiency Panel

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Date of Request: May 24, 2017
Due Date: June 5, 2017

Request No. DPS-136 LMR-1
NMPC Req. No. NM-572

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Lisa Rosi

TO: National Grid, Electric Customer Panel

SUBJECT: ***ENERGY EFFICIENCY EVALUATION COSTS***

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

1. Identify, describe, and quantify the cost categories that are included in the EM&V budget currently in the Company's Energy Efficiency Transition and Implementation Plan (ETIP) for both electric and gas.
2. Provide the historical EM&V expenditures for 2012 through and including 2016 for both electric and gas energy efficiency activities.
3. Describe how any under- or over-spending of the EM&V budget would be addressed under the Company's proposal.
4. The Panel states on page 36 of its Pre-Filed Direct Testimony that, "[EM&V] costs are either not directly related to delivery of the energy efficiency portfolio in the ETIP or are scoped to integrate initiatives not limited solely to energy efficiency." Explain how EM&V activities are not directly related to delivery of the energy efficiency portfolio, or are otherwise scoped beyond energy efficiency. To the extent not otherwise discussed, fully explain the basis for the Company's proposal to exclude EM&V costs from the ETIP budget and instead include such costs in base rates.
5. Explain in detail the process that the Company will use to identify and prioritize the EM&V activities that it will conduct, including the frequency of those activities.

Response:

1. Cost categories included in the current evaluation, measurement and verification (“EM&V”) budget include labor, outside consultants, travel expenses, and other miscellaneous costs associated with telecommunications and office supplies.

Internal labor is the cost associated with labor hours worked by the Company’s staff to administer EM&V activities (*e.g.*, developing scope of studies, impact or process evaluations, monitoring, and verification). Outside consultants may be engaged to perform a statistical analysis of the data being studied, complete telephone surveys and interviews, and provide reports on study findings. Travel expenses include conference fees, airfare, hotels, and meals for Company staff. Other miscellaneous expenses include office supplies, equipment, and telecommunications.

The 2017 electric ETIP EM&V budget is \$2,540,178. This includes \$400,162 for internal labor and \$2,140,016 for outside consultant costs associated with the conduct of studies and related travel expenses, supplies, and telecommunications.

The 2017 gas ETIP EM&V budget is \$526,814. This includes \$82,991 for internal labor and \$443,823 for outside consultant costs associated with the conduct of studies and related travel expenses, supplies, and telecommunications.

In the rate filing, the Company made adjustments to move budgeted internal labor costs (including labor associated with EM&V activities) and non-labor related EM&V costs to base rates.

2. See Attachment 1 to DPS-136 LMR-1 for the historic EM&V expenditures from 2012 through and including 2016 for both electric and gas energy efficiency activities.
3. The Company proposes to manage EM&V funds within the rate allowance and is not proposing a reconciliation.
4. As discussed in the testimony of the Electric Customer Panel, the Company proposes to move into base rates costs for activities that help facilitate the energy efficiency portfolio of programs. EM&V costs generally involve back-office activities that support energy efficiency programs. These activities are indirectly related to the actual energy efficiency programs. Further, the Company believes that the scope of some of its current EM&V activities can be expanded to include information valuable to the strategies of the Company’s other clean energy programs. As an example, a program impact study that is currently scoped to look at energy efficiency savings accuracy may be expanded to look at the program’s effect on distributed energy resources (“DER”) potential, as well as DER program impacts. If the Company’s proposal is approved, the Company would modify the scope of such EM&V activities as needed to support other DER offerings, and would reflect such collaborative EM&V activities in its biannual DSIP filings.

Just as the Track One Order in the REV Proceeding notes that energy efficiency contributes benefits to the entire distribution system, and not just achievement of the State's clean energy goals, so too should be the recognition that certain energy efficiency administrative functions, such as EM&V, contribute benefits to the portfolio of DER offerings as well. Along the same vein, not all costs are purely energy efficiency and the Company believes that since multiple DER programs may benefit from the results of such EM&V activities, there should be a common funding source for all EM&V in base rates. With this, the Company intends to review the EM&V needs of various clean energy programs with the objective of finding opportunities to support common goals. For all of these reasons, the Company believes that EM&V costs should be transitioned to base rates instead of recovered through the surcharge.

5. The Clean Energy Guidance document, CE-05,¹ developed by Department of Public Service Staff in consultation with the Clean Energy Advisory Council ("CEAC") as directed by the Commission in the January 21, 2016 Clean Energy Fund Order, provides guidance on the conduct of EM&V activities associated with customer-funded clean energy programs.

The Company annually prepares a high-level EM&V activity plan outlining the general activities to be pursued in a given year. More detail will be developed for specific EM&V activities within the plan that clearly identify the goals of the activity, the approach to be taken, and the identification of corresponding deliverables and timelines. Development of the annual plan includes a review of the clean energy programs offered by the Company to determine the appropriate planning approach such as identifying data collection needs in the launching of new programs, identifying specific focus areas to be assessed for mature programs, and/or collaborating resources on a statewide or regional basis for market or baseline assessments.

When prioritizing EM&V activities, the Company places a high priority on those activities as outlined in the Clean Energy Guidance document, CE-05, that defer infrastructure investment; are eligible for EAMs; perform above or below expectations; are implemented on a pilot basis; have a high savings variability; have a limited existing knowledge basis; and/or are represented by a significant savings to the overall portfolio.

The frequency of EM&V activities will be assessed when the annual plan is prepared and will take into account the nature of the program, measure, and/or technology that is being evaluated. As appropriate, the timetable may follow a more typical cycle, whereby a process evaluation is conducted in year one followed by an impact evaluation. The Company will also consider shorter and more focused EM&V activities as results are available from evaluations to date, or where information gaps and other areas requiring analysis are identified.

Name of Respondent:
Lisa Tallet

Date of Reply:
June 5, 2017

¹ CE-05, Evaluation, Measurement & Verification Guidance, Version 1.0, New York State Department of Public Service – Office of Clean Energy (dated November 1, 2016).

		Evaluation Spend									
		EEPS						ETIP			
	2012		2013		2014		2015	2016	2016	Total	
Nimo Electric	\$	1,245,566	\$	1,300,596	\$	947,762	\$	745,998	\$ 1,079,487	\$ 262,972	\$ 5,582,380
Nimo Gas	\$	237,131	\$	350,018	\$	332,342	\$	248,918	\$ 73,728	\$ 96,168	\$ 1,338,305

Date of Request: June 1, 2017
Due Date: June 12, 2017

Request No. DPS-202 LMR-5
NMPC Req. No. NM-642

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Lisa Rosi
TO: National Grid, Gas Infrastructure and Operations Panel
SUBJECT: ***ENERGY EFFICIENCY LABOR COSTS***

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

1. For each month in 2016, provide a breakdown of the following information associated with energy efficiency programs:
 - a. The number of full and part-time employees;
 - b. The job title and description associated with each position that relates to the energy efficiency programs; and
 - c. The associated labor expenses, by employee.
2. Describe in detail any changes that the Company is planning to make to the number of employees after labor is included in base rates.

Response:

1. See Attachment 1.
2. The Company plans to continue the current complement of employees and add resources, as necessary, to support the higher targets for savings consistent with the outcomes projected by the Clean Energy Advisory Council (“CEAC”) working group activities.

Name of Respondent:
Lisa Tallet

Date of Reply:
June 12, 2017

Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238
Attachment 1 to DPS-2021 LMR-5
Page 1 of 2

Segment	Personnel ID	Personnel Job Title	L03 Originating Cost Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYLEC	7000500	Dr Sales	160-Customer	160-Sales & Program Operations	Full Time	\$202												\$202
NYLEC	7000593	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$2,177	\$610	\$403	\$601	\$689	\$1,599	\$1,133	\$757	\$1,269	\$967	\$768	\$1,336	\$12,108
NYLEC	7000806	Manager	160-Customer	160-Market Development	Full Time	\$664	\$1,235	\$901	\$1,371	\$977	\$1,582	\$1,173	\$1,164	\$631	\$1,170	\$1,399	\$943	\$0
NYLEC	70001476	VP Sharing Our Future	200-Exec Director-US	200-Sharing the Future	Full Time													\$0
NYLEC	70001476	Manager	160-Customer	160-Customer Engagement	Full Time	\$153	\$357	\$51	\$276			\$51		\$89	\$100	\$445	\$455	\$1,889
NYLEC	70001662	Prin Specialist	160-Customer	160-Customer Assurance	Full Time	\$693	\$329	\$750	\$959	\$835	\$876	\$750	\$771	\$771	\$846	\$901	\$836	\$9,315
NYLEC	70003432	Lead Engineer	160-Customer	160-Market Development	Full Time	\$616										\$29	\$435	\$1,050
NYLEC	70006163	Lead Analyst	180-New Energy Solutions	160-Market Development	Full Time												\$869	\$869
NYLEC	70006809	Manager	160-Customer	160-Customer Assurance	Full Time	\$603	\$638	\$303	\$622	\$573	\$678	\$340	\$539	\$631	\$599	\$599	\$432	\$5,122
NYLEC	70006172	Sr Analyst	320-US Finance	160-Customer Assurance	Full Time	\$495	\$434	\$387	\$537	\$505	\$335	\$305	\$420	\$489	\$486	\$560	\$494	\$5,447
NYLEC	70009333	220-Jurisdictions-MA	220-Maint & Const MA Elec	310-HR SVP	Full Time												\$876	\$0
NYLEC	70009601	Lead Engineer	160-Customer	160-Market Development	Full Time	\$5,153	\$8,097	\$8,833	\$9,254	\$6,678	\$7,940	\$8,833	\$8,581	\$9,224	\$7,186	\$7,723	\$6,221	\$93,724
NYLEC	70011390	Lead Consultant	330-Total US IS	330-US IS	Full Time	\$575	\$364	\$521	\$407	\$214	\$300	\$266	\$193	\$321	\$278	\$321	\$257	\$3,588
NYLEC	70011699	Sr Analyst	160-Customer	160-Customer Assurance	Full Time	\$12	\$7	\$16	\$14	\$3	\$173	\$2	\$2	\$2	\$2	\$3	\$3	\$249
NYLEC	70015747	Lead Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$333	\$467	\$700	\$767	\$477	\$533	\$567	\$596	\$591	\$559	\$729	\$373	\$6,962
NYLEC	70016431	Dr Account Mgt	160-Customer	160-Sales & Program Operations	Full Time	\$2,129	\$1,981	\$2,327	\$2,179	\$1,684	\$1,585	\$990	\$1,618	\$1,074	\$878	\$765	(\$12)	\$2,401
NYLEC	70017004	Lead Analyst	160-Customer	160-Market Development	Part Time									\$2,284	\$5,833	\$4,347	\$1,699	\$53,178
NYLEC	70017226	Principal Economist	160-Customer	160-Advanced Data & Analytics	Full Time										\$21	\$21	\$21	\$21
NYLEC	70017228	Sr Representative	160-Customer	160-Customer Assurance	Full Time	\$824	\$375	\$432	\$173	\$115	\$86	\$445	\$118	\$118	\$118	\$326	\$335	\$2,804
NYLEC	70017339	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$259	\$493	\$463	\$545	\$457	\$45	\$5	\$27	\$5	\$3	\$3	\$3	\$86
NYLEC	70018853	Prin IT Engineer	330-Total US IS	330-IS Disrupt Risk & Security	Full Time	\$1,085	\$1,356											\$2,441
NYLEC	70019218	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$840	\$5,986											\$6,826
NYLEC	70019394	Manager	160-Customer	160-Sales & Program Operations	Full Time		\$6,616	\$7,246	\$5,776	\$6,826	\$5,041	\$4,974	\$6,667	\$5,397	\$6,618	\$5,921	\$67,908	\$1,382
NYLEC	70019448	Dir IT Business Relations	330-Total US IS	330-US IS	Full Time		\$77			\$155	\$191	\$120	\$73			\$75	\$75	\$383
NYLEC	70019489	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$2,212	\$0	(\$180)		\$430	\$191	\$120	\$73					\$814
NYLEC	70019563	Lead Program Representative	160-Customer	210-IDx Executive-NY	Full Time	\$4,661	\$5,593	\$2,747	\$5,994	\$6,080	\$6,059	\$6,952	\$7,021	\$7,704	\$6,144	\$5,510	\$75,900	\$1,023
NYLEC	70019625	Sr Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$932	\$2,486	\$3,263	\$3,573	\$2,952	\$1,864	\$1,864	\$962	\$1,443	\$2,244	\$1,847	\$25,429	\$2,683
NYLEC	70020761	Not assigned	160-Customer	160-Sales & Program Operations	Full Time	\$2,453	\$230	\$230	\$2,268	\$2,084	\$2,268	\$1,824	\$2,112	\$2,304	\$3,366	\$2,020	\$24,098	\$2,683
NYLEC	70020958	Lead Program Representative	160-Customer	160-Sales & Program Operations	Full Time	\$1,701	\$1,701	\$1,984	\$1,406	\$2,268	\$1,984	\$2,268	\$1,417	\$1,984	\$1,615	\$1,984	\$1,984	\$19,852
NYLEC	70021211	Lead Engineer	160-Customer	160-Sales & Program Operations	Full Time	\$5,909	\$5,757	\$6,060	\$6,969	\$6,060	\$9,979	\$6,836	\$9,979	\$6,836	\$9,979	\$6,836	\$9,979	\$78,054
NYLEC	70021444	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$968	\$921	\$555	\$1,087	\$591	\$709	\$971	\$972	\$696	\$852	\$1,202	\$505	\$9,849
NYLEC	70022445	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$25,980
NYLEC	70022824	Lead Program Manager	160-Customer	160-Market Development	Full Time	\$4,110	\$2,302	\$3,329	\$6,042	\$3,288	\$2,466	\$1,973	\$1,782	\$729	\$1,254	\$836	\$209	\$28,320
NYLEC	70024438	Service Representative C	210-Jurisdictions-NY	210-Customer Mktg Services-NY	Full Time						\$72	\$205	\$177	\$88				\$1,600
NYLEC	70024656	Sr Data Scientist	200-Exec Director-US	200-Advanced Data & Analytics	Full Time				\$112	\$169	(\$25)	\$322						\$542
NYLEC	70025488	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,981	\$6,321	\$6,781	\$7,326	\$6,589	\$6,970	\$6,443	\$5,403	\$6,579	\$6,775	\$5,011	\$73,650	\$1,382
NYLEC	70025939	Lead Program Manager	160-Customer	210-IDx Executive-NY	Full Time	\$3,832	\$4,347	\$3,663	\$5,262	\$4,576	\$4,976	\$5,676	\$3,642	\$2,731	\$1,292	\$2,031	\$1,292	\$37,604
NYLEC	70026895	Representative	210-Jurisdictions-NY	210-IDx Executive-NY	Full Time	\$2,340	\$5,130	\$5,569	\$6,240	\$4,725	\$5,299	\$5,079	\$5,288	\$5,526	\$5,390	\$4,339	\$3,526	\$59,912
NYLEC	70027429	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,402	\$6,254	\$6,363	\$6,739	\$5,660	\$6,739	\$5,567	\$4,573	\$6,405	\$5,795	\$6,405	\$5,795	\$70,940
NYLEC	70028159	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$2,598	\$25,980
NYLEC	70029454	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$6,195	\$6,363	\$5,358	\$7,702	\$5,693	\$7,367	\$2,442	\$4,880	\$7,146	\$6,448	\$6,971	\$5,728	\$76,694
NYLEC	70030626	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$5,871	\$3,403	\$5,247	\$7,615	\$4,956	\$7,487	\$5,722	\$5,930	\$6,905	\$6,702	\$5,618	\$5,855	\$71,287
NYLEC	70031440	Lead Representative	160-Sales & Program Operations	160-Sales & Program Operations	Full Time	\$3,740	\$2,493	\$7,022	\$5,722	\$5,402	\$5,722	\$5,132	\$3,923	\$5,789	\$5,853	\$4,347	\$3,012	\$48,125
NYLEC	70031774	Lead IT Architect	330-Total US IS	330-US IS	Full Time	\$186	\$133	\$80	\$33		\$159	\$106			\$54	\$27	\$54	\$852
NYLEC	70032014	Dir Strategic Communication	460-Corporate Affairs	460-Strategic Communications	Full Time	\$3,123	\$4,946	\$4,466	\$5,987	(\$9)								\$19,522
NYLEC	70032196	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$1,625	\$1,816	\$1,912	\$3,107	\$7,646	\$7,696	\$6,381	\$7,021	\$7,190	\$4,600	\$7,197	\$7,266	\$64,260
NYLEC	70034361	Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$785												\$785
NYLEC	70036545	Sr Project Manager - Ops	160-Customer	160-Sales & Program Operations	Full Time	\$5,860	\$6,603	\$3,302										\$15,765
NYLEC	70036615	Dr Sales	160-Customer	160-Sales & Program Operations	Full Time													\$0
NYLEC	70036811	Manager	330-Total US IS	330-US IS	Full Time				\$166	\$552	\$276	\$0	\$476	\$308	\$224	\$364	\$2,366	\$1,820
NYLEC	70036840	Exec Advisor	160-Customer	160-Customer Leader	Full Time	\$678	\$927	\$976	\$1,122	\$781	\$1,103	\$977	\$1,282	\$1,299	\$1,395	\$1,116	\$1,325	\$12,981
NYLEC	70038190	Lead Engineer	160-Customer	160-Market Development	Full Time													\$0
NYLEC	70038413	Engineer Manager	160-Customer	160-Sales & Program Operations	Full Time													\$1,118
NYLEC	70031586	Dr Program Strategy	160-Customer	160-Market Development	Full Time	\$2,172	\$6,183	\$5,328	\$8,623	\$4,556	\$7,159	\$6,427	\$4,622	\$2,889	\$5,055	\$3,900	\$3,611	\$60,524
NYLEC	70031980	Lead Program Manager	160-Sales & Program Operations	160-Sales & Program Operations	Full Time	\$4,509	\$5,593	\$6,525	\$7,147	\$5,994	\$6,080	\$6,059	\$6,952	\$7,021	\$7,704	\$6,144	\$5,510	\$75,900
NYLEC	70032823	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,500	\$5,153	\$12,556	\$4,556	\$6,467	\$6,097	\$5,414	\$6,166	\$6,317	\$6,418	\$5,202	\$68,438	\$1,382
NYLEC	70035010	Manager	160-Customer	160-Customer Assurance	Full Time	\$773	\$743	\$822	\$822	\$822	\$626	\$783	\$845	\$684	\$764	\$845	\$804	\$9,332
NYLEC	70035795	Manager	160-Customer	160-Market Development	Full Time	\$5,615	\$1,718	\$5,097	\$5,968	\$5,178	\$5,451	\$5,724	\$5,335	\$5,182	\$4,855	\$5,869	\$4,548	\$68,917
NYLEC	70035799	Lead Program Manager	180-VP New Energy Solutions	180-VP New Energy Solutions	Full Time	\$3,729	\$3,146	\$2,874	\$3,767	\$2,729	\$4,851	\$4,691	\$4,691	\$4,691	\$4,691	\$4,691	\$4,691	\$45,599
NYLEC	70035801	Lead Analyst	180-New Energy Solutions	180-VP New Energy Solutions	Full Time		\$1,763	\$2,194	\$1,410	\$2,141	\$2,186	\$2,080	\$3,319	\$1,572	\$3,039	\$2,996	\$3,006	\$26,904
NYLEC	70035878	Lead Planner	160-Customer	110-Electric Process & Engineering	Full Time	\$725	\$289											\$1,014
NYLEC	70035883	SVP Chief Customer Officer	200-Exec Director-US	200-Sharing the Future	Full Time	\$1,022		\$1,923	\$2,482	\$462	\$4,098	\$2,367	\$1,429	\$1,864	\$1,864	\$1,864	\$1,864	\$17,883
NYLEC	70042602	Acting Coordinator	200-Exec Director-US	200-Sharing the Future	Full Time										\$167	\$167	\$249	\$0
NYLEC	70046966	Lead Program Manager	160-Customer	160-Market Development	Full Time													\$0
NYLEC	70046994	Sr Specialist	160-Customer	160-Customer Engagement	Full Time													\$67
NYLEC	70055118	Analyst	160-Customer	160-Process & Performance	Full Time				\$107	\$119	\$62			\$123	\$34			\$466
NYLEC	70054711	Lead Analyst	160-Customer	160-Market Development	Full Time	\$154	\$208		\$35	\$35	\$19	\$18	\$9					\$477
NYLEC	70056763	Sr Specialist	160-Customer	160-Customer Engagement	Full Time	\$612	\$379	\$399	\$459	\$399	\$442	\$376	\$382	\$443	\$410	\$394	\$331	\$3,027
NYLEC	70067754	Sr Tech Supp Consultant	160-Customer	160-Market Development	Full Time	\$731	\$822	\$2,010	\$2,010	\$1,644	\$2,010	\$1,096	\$1,122	\$439	\$1,122	\$48	\$858	\$11,707
NYLEC	70071341	VP New Energy Solutions	160-Customer	180-VP New Energy Solutions	Full Time				\$740	\$730								\$1,470
NYLEC	70071569	Lead Analyst	160-Customer	160-Customer Assurance	Full Time									\$351	\$448	\$702	\$635	\$2,136
NYLEC	70071542	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$1,705	\$845	\$1,190	\$2,014	\$1,653	\$1,443	\$1,729	\$1,516	\$1,723	\$2,330	\$1,344	\$1,348	\$18,840
NYLEC	70071592	Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$224	\$673											\$898
NYLEC	70071206	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$5,958	\$4,500	\$3,774	\$6,677	\$5,806	\$6,097	\$6,097	\$5,156	\$4,813	\$6,317	\$6,047	\$6,041	\$67,572
NYLEC	70071328	Sr Engineer	16															

NYELEC	71095359	Exec Asst to Band B	160-Customer	160-Sales & Program Operations	Full Time		\$488	\$346	\$214	\$313	\$329	\$289	\$330	\$321	\$287	\$287	\$3,202
NYELEC			180-New Energy Solutions	160-Sales & Program Operations	Full Time	\$72	\$251										\$323
NYELEC	72000522	Lead Analyst	160-Customer	160-Advanced Data & Analytics	Full Time	\$246	\$401	\$298	\$259	\$262	\$248	\$260	\$236	\$124			\$2,334
NYELEC	72001338	Lead Analyst	160-Customer	160-Process & Performance	Full Time		\$209	\$174	\$174	\$174	\$182	\$191	\$182	\$191	\$136		\$1,613
NYELEC	72002849	Coordinator	160-Customer	160-Customer Engagement	Full Time	\$284	\$532	\$310	\$547	\$812	\$15	\$620	\$2,156	\$282	\$475	\$231	\$590
NYELEC	72004713	Sr Analyst	320-US Finance	320-Finance Operations	Full Time	\$741	\$351	\$1,107	\$719	\$686	\$359	\$1,013	\$866	\$719	\$654	\$686	\$98
NYELEC	72004795	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time						\$28	\$143	\$206	\$204	\$192	\$157	\$930
NYELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time			\$78	\$135	\$135	\$81						\$429
NYELEC	72005766	Assoc Analyst	160-Customer	160-Market Development	Full Time	\$2,443	\$2,062	\$2,387	\$2,170	\$2,170	\$2,496	\$2,062	\$1,661	\$2,333	\$2,628	\$1,682	\$25,779
NYELEC	72005965	VP Marketing & Cust Experience	160-Customer	160-Customer Engagement	Full Time	\$329	\$359	\$320	\$460	\$406	\$406	\$454	\$432	\$436	\$432	\$348	\$4,636
NYELEC	72006011	Manager	160-Customer	160-Process & Performance	Full Time			\$131	\$107	\$125	\$119	\$125	\$134	\$140	\$120	\$114	\$1,115
NYELEC	72006077	Category Manager	160-Customer	450-Procurement Strategy	Full Time						\$201						\$0
NYELEC			450-Global Procurement	450-Procurement Strategy	Full Time												\$101
NYELEC	72006289	Sr. Process Manager	160-Customer	210-Maint & Const-NY Gas	Full Time	\$5,018	\$6,273	\$6,042	\$7,148	\$6,389	\$6,933	\$6,933	\$6,912	\$6,349	\$6,630	\$7,906	\$4,858
NYELEC	72006307	Tech Support Consultant	160-Customer	160-Sales & Program Operations	Full Time	\$3,095	\$4,355	\$4,535	\$5,283	\$4,542	\$3,779	\$4,283	\$4,607	\$4,305	\$4,833	\$5,583	\$3,804
NYELEC	72006402	Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$1,045	\$1,205	\$1,332	\$1,301	\$634	\$698	\$539	\$679	\$711	\$517	\$647	\$647
NYELEC	72007812	Manager	160-Customer	160-Customer Engagement	Full Time	\$626	\$297	\$329	\$344	\$313	\$297	\$329	\$332	\$348	\$316	\$332	\$269
NYELEC	72008466	Lead Economist	160-Customer	160-Advanced Data & Analytics	Full Time				\$108	\$149	\$260	\$248	\$273	\$153	\$35	\$25	\$1,252
NYELEC	72008589	Sr Analyst	160-Customer	160-Market Development	Full Time	\$864	\$2,221	\$2,097	\$2,344	\$2,327	\$2,468	\$2,900	\$3,145	\$3,002	\$2,471	\$2,328	\$28,668
NYELEC	72009276	Exec Asst to Band B	160-Customer	160-Energy Procurement	Full Time				\$159	\$174	\$155	\$157	\$142	\$149	\$145	\$134	\$1,214
NYELEC	72010030	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,682	\$5,734	\$5,879	\$6,677	\$5,806	\$4,645	\$5,806	\$6,016	\$5,715	\$6,376	\$6,376	\$69,730
NYELEC	72010211	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,935	\$5,516	\$6,097	\$6,677	\$5,806	\$6,387	\$6,423	\$6,016	\$602	\$4,813	\$7,048	\$6,376
NYELEC			320-US Finance	320-Shared Services	Full Time												\$4,662
NYELEC	72010315	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,935	\$2,903	\$8,419	\$6,677	\$5,806	\$6,097	\$5,226	\$6,317	\$5,114	\$6,317	\$6,665	\$6,712
NYELEC	72010499	Analyst	160-Customer	160-Customer Engagement	Full Time	\$87	\$87				\$279	\$203					\$656
NYELEC	72012148	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$4,231	\$5,193	\$8,462	\$8,524	\$5,481	\$3,221	\$4,327	\$6,209	\$6,111	\$6,209	\$6,111	\$6,066
NYELEC	72013721	Sr Project Manager - Ops	160-Customer	160-Process & Performance	Full Time		\$180	\$180	\$163	\$155	\$139	\$149	\$140	\$165	\$157	\$149	\$1,397
NYELEC	72013753	Category Manager	450-Global Procurement	450-Procurement Strategy	Full Time												\$490
NYELEC	72014134	Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time						\$48	\$121	\$137	\$118	\$135	\$139	\$837
NYELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time			\$67	\$115	\$73							\$254
NYELEC	72014227	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$535	\$1,012	\$1,430	\$1,031	\$2,082	\$603	\$183	\$472	\$515	\$330	\$329	\$682
NYELEC	72014277	Sr Analyst	160-Customer	160-Customer Engagement	Full Time				\$14			\$7	\$7	\$14	\$7	\$55	\$7
NYELEC	72014347	Analyst	160-Customer	160-Market Development	Full Time										\$69		\$69
NYELEC	72015776	Seasonal Intern	160-Customer	160-Sales & Program Operations	Part Time				\$730	\$2,448	\$2,736	\$1,563					\$7,467
NYELEC	72016715	Intern	160-Customer	160-Market Development	Part Time				\$242	\$2,188	\$2,969	\$1,721	\$366	\$220	\$951		\$8,415
NYELEC			450-Global Procurement	450-Procurement Ops-US	Part Time					\$242	\$258	\$102	\$221	\$256	\$198	\$333	\$221
NYELEC	72017186	Manager	160-Customer	160-Advanced Data & Analytics	Full Time				\$125	\$193	\$241	\$128					\$686
NYELEC	72017590	Sr Analyst	160-Customer	160-Market Development	Full Time	\$3,684	\$2,679	\$2,538	\$2,335	\$2,379	\$3,196	\$3,058	\$1,960	\$3,431	\$3,104	\$3,022	\$2,777
NYELEC	72017846	Analyst	160-Customer	160-Market Development	Full Time	\$2,441	\$3,047	\$2,216	\$3,185	\$2,770	\$3,047	\$2,814	\$2,993	(\$4,159)	(\$379)		\$17,674
NYELEC	72019483	Dir Customer Engagement	160-Customer	160-Customer Engagement	Full Time			\$6	(\$6)			\$249					\$0
NYELEC	72019936	Sr Analyst	160-Customer	160-Customer Engagement	Full Time				\$289	\$305	\$281	\$168	\$469	\$251	\$503	\$503	\$2,770
NYELEC	72020068	Project Manager - Ops	180-New Energy Solutions	180-VP New Energy Solutions	Full Time										\$64		\$64
NYELEC	72020680	Seasonal Intern	160-Customer	160-Customer Engagement	Full Time					\$378	\$313	\$313	\$165				\$1,168
NYELEC	72021158	Lead Analyst	160-Customer	160-Market Development	Full Time				\$743	\$5,200	\$4,997	\$4,759	\$4,997	\$5,235	\$3,712	\$29,642	
NYELEC	72022024	Specialist	160-Customer	160-Customer Engagement	Full Time								\$61	\$52	\$121	\$234	\$0
NYELEC	72022049	Sr Analyst	160-Customer	160-Customer Engagement	Full Time							\$46	(\$46)				\$0
NIMO Electric Total						\$215,544	\$238,954	\$264,176	\$300,577	\$243,324	\$270,420	\$251,463	\$242,917	\$239,124	\$241,249	\$243,438	\$213,242
Employee Count						107	107	108	124	121	127	130	130	128	123	132	120
																	201
Time Not Worked Adjustments						\$100,971	\$63,853	\$37,580	\$16,327	\$44,801	\$50,757	\$42,451	\$43,785	\$36,408	\$41,891	\$44,704	(\$12,462)
						(\$7,622)	(\$1,613)	\$5,400	(\$76,330)	\$20,920	\$31,763	(\$390)	\$17,542	(\$24,707)	\$5,990	\$23,745	(\$17,007)
						\$308,895	\$302,644	\$307,156	\$240,566	\$309,045	\$352,440	\$292,024	\$384,244	\$250,826	\$298,130	\$311,887	\$182,873
Pension and OPEB						\$28,480	\$32,397	\$37,146	\$28,069	\$31,030	\$35,290	\$30,571	\$30,875	\$26,618	\$29,569	\$28,972	\$12,923
						\$59,072	\$68,159	\$76,398	\$53,465	\$65,452	\$75,871	\$61,683	\$65,023	\$52,049	\$57,918	\$65,062	\$46,952
Other Benefits						\$837	\$4,923	\$7,061	(\$714)	(\$485)	\$1,137	\$1,009	\$988	\$897	\$319	\$327	\$245
						\$1,672	\$1,942	\$2,153	\$2,325	\$2,873	\$3,396	\$2,757	\$2,919	\$2,319	\$2,828	\$3,142	\$2,287
						\$34,397	\$39,544	\$62,444	\$38,369	\$45,615	\$52,494	\$43,422	\$45,221	\$36,976	\$44,685	\$48,464	\$35,398
						\$17,968	\$20,599	\$31,245	\$22,589	\$28,886	\$38,067	\$25,600	\$26,674	\$21,792	\$24,069	\$26,223	\$19,118
						\$10,983	\$12,675	\$16,678	\$10,082	\$13,476	\$15,850	\$14,414	\$15,245	\$12,132	\$13,000	\$14,645	\$10,558
						\$3,006	\$3,440	\$3,905	\$1,918	\$2,037	\$2,146	\$2,391	\$2,403	\$2,090	\$3,128	\$3,167	\$2,367
						\$28,656	\$38,702	\$101,750	\$35,775	\$42,952	\$49,816	\$40,980	\$43,020	\$34,941	\$39,653	\$43,021	\$31,410
						\$185,071	\$222,381	\$338,780	\$192,778	\$229,836	\$266,967	\$222,827	\$232,766	\$189,814	\$215,169	\$231,023	\$170,358
Grand Total Labor costs																	\$6,153,800

(1) Recovered in Base Rates.

Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238
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Segment	Personnel ID	Personnel Job Title	L&O Originating Cost Center	L&O Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYGASD	70005900	Dir Sales	160 Customer	160-Sales & Program Operations	Full Time	\$317	\$61	\$114	\$143									\$317
NYGASD	70005933	Manager	160 Customer	160-Sales & Program Operations	Full Time	\$49												\$49
NYGASD	70008066	Manager	160 Customer	160-Market Development	Full Time	\$46												\$46
NYGASD	70001341	VP Strategic Ops Future	200-Exec Director-US	200-Strategic Ops Future	Full Time						\$193	\$46	\$3	\$83	\$120	\$12	\$110	\$567
NYGASD	70001476	Manager	160 Customer	160-Customer Engagement	Full Time	\$153	\$306	\$255	\$339	\$458	\$255	\$306	\$262	\$262	\$628	\$419	\$471	\$4,113
NYGASD	70001662	Prin Specialist	160 Customer	160-Sales & Program Operations	Full Time	\$142	\$772	\$240	\$307	\$266	\$282	\$240	\$247	\$247	\$267	\$289	\$374	\$3,374
NYGASD	70002311	Dir Program Strategy	160 Customer	160-Market Development	Full Time													\$8
NYGASD	70006163	Lead Analyst	160 Customer	160-Customer Assurance	Full Time	\$153	\$206	\$99	\$199	\$184	\$313	\$109	\$155	\$201	\$191	\$191	\$139	\$1,782
NYGASD	70006172	Sr Analyst	160 Customer	160-Customer Assurance	Full Time	\$100	\$143	\$127	\$163	\$153	\$102	\$92	\$141	\$148	\$147	\$169	\$149	\$1,633
NYGASD	70006889	Dir Human Resources Provs	180-New Energy Solutions	310-IRL SVP	Full Time	\$75	\$86	\$80	\$102	\$54	\$75	\$59	\$48	\$80	\$70	\$80	\$64	\$230
NYGASD	70011390	Lead Consultant	330-Total US IS	330-US IS	Full Time	\$2	\$4	\$4	\$4	\$1	\$40					\$1	\$1	\$60
NYGASD	70011699	Sr Analyst	160 Customer	160-Customer Assurance	Full Time	\$372	\$144	\$215	\$236	\$233	\$164	\$174	\$183	\$182	\$172	\$226	\$115	\$2,416
NYGASD	70015747	Lead Analyst	160 Customer	160-Sales & Program Operations	Full Time													\$23
NYGASD	70016431	Lead Account Mgr	160 Customer	160-Sales & Program Operations	Full Time													\$898
NYGASD	70017004	Lead Analyst	160 Customer	160-Market Development	Part Time	\$1,832	\$1,783	\$2,327	\$2,179	\$1,684	\$1,486	\$990	\$1,618	\$2,284	\$2,137	\$2,617	\$1,718	\$22,756
NYGASD	70017226	Principal Economist	160 Customer	160-Advanced Data & Analytics	Full Time	\$64	\$7	\$18	\$28	\$22	\$28	\$33	\$18	\$28	\$17	\$15	\$20	\$98
NYGASD	70017228	Sr Representative	200-Exec Director-US	160-Advanced Data & Analytics	Full Time	\$643	\$1,168	\$281	\$3,370	\$5,515	\$5,547	\$4,135	\$4,994	\$4,637	\$6,722	\$6,091	\$1,442	\$48,831
NYGASD	70017739	Sr Analyst	160 Customer	160-Sales & Program Operations	Full Time	\$279					\$44	\$193	\$140	\$157	\$184	\$140	\$193	\$215
NYGASD	70018853	Prin IT Engineer	330-Total US IS	330-IS District Risk & Security	Full Time	\$245					\$117	\$5	\$27	\$5	\$3	\$3	\$9	\$167
NYGASD	70019194	Manager	160 Customer	160-Sales & Program Operations	Full Time	\$4,201	\$399	\$441	\$483	\$357	\$441	\$356	\$317	\$444	\$360	\$441	\$395	\$8,615
NYGASD	70019448	Dir IT Business Relations	330-Total US IS	330-US IS	Full Time						\$155				\$75			\$230
NYGASD	70019489	Lead Program Manager	160 Customer	160-Sales & Program Operations	Full Time	\$2,870	\$5,992	\$5,776	\$8,030	\$7,074	\$7,457	\$7,911	\$5,388	\$5,461	\$5,120	\$4,681	\$4,145	\$69,665
NYGASD	70019651	Sr Project Representative	160 Customer	160-Sales & Program Operations	Full Time	\$321	\$222	\$246	\$621	\$1,243	\$111	\$111	\$962	\$962	\$244	\$1,443	\$1,443	\$11,047
NYGASD	70019625	Sr Program Manager	160 Customer	160-Sales & Program Operations	Full Time	\$1,554	\$932	\$466	\$621	\$1,243	\$111	\$111	\$962	\$962	\$244	\$1,443	\$1,443	\$11,047
NYGASD	70020761	Not assigned	160 Customer	160-Sales & Program Operations	Full Time	\$245		\$230										\$230
NYGASD	70021211	Lead Trainer	160 Customer	160-Sales & Program Operations	Full Time	\$1,620	\$831	\$1,621	\$1,259	\$1,247	\$1,309	\$1,387	\$1,336	\$1,336	\$1,336	\$1,336	\$1,336	\$14,288
NYGASD	70021444	Lead Sales Representative	160 Customer	160-Sales & Program Operations	Full Time	\$243		\$283	\$331	\$118	\$71	\$130	\$168	\$168	\$168	\$131	\$323	\$2,608
NYGASD	70023445	Lead Program Manager	160 Customer	160-Sales & Program Operations	Full Time											\$711	\$634	\$603
NYGASD	70023445	Sr Data Scientist	160 Customer	160-Advanced Data & Analytics	Full Time	\$1,288	\$2,219	\$452	\$82	\$822	\$239	\$1,570	\$575	\$418	\$1,254	\$418	\$1,254	\$14,288
NYGASD	70025488	Lead Sales Representative	200-Exec Director-US	160-Advanced Data & Analytics	Full Time	\$628	\$795	\$879	\$915	\$915	\$915	\$915	\$915	\$915	\$915	\$915	\$915	\$9,150
NYGASD	70025939	Lead Program Manager	160 Customer	210-Jurisdictions-NY	Full Time	\$858	\$1,087	\$915	\$1,052	\$1,144	\$1,258	\$1,144	\$980	\$781	\$1,525	\$871	\$654	\$10,052
NYGASD	70027429	Lead Sales Representative	210-Jurisdictions-NY	210-IRL Executive-NY	Full Time													\$802
NYGASD	70028159	Manager	160 Customer	160-Sales & Program Operations	Full Time	\$957	\$108	\$879	\$963	\$837	\$963	\$795	\$655	\$523	\$508	\$508	\$508	\$9,641
NYGASD	70030626	Sr Analyst	160 Customer	160-Sales & Program Operations	Full Time				\$2,103	\$2,367	\$2,020	\$3,354	\$1,740	\$2,485	\$1,553	\$2,578	\$2,078	\$20,478
NYGASD	70031440	Lead Analyst	160 Customer	160-Sales & Program Operations	Full Time	\$936	\$2,042	\$221	\$213	\$419	\$1,744	\$1,395	\$814	\$712	\$356	\$490	\$8,071	\$16,429
NYGASD	70031774	IT Architect	330-Total US IS	330-US IS	Full Time	\$1,620	\$831	\$1,621	\$1,259	\$1,247	\$1,309	\$1,387	\$1,336	\$1,336	\$1,336	\$1,336	\$1,336	\$14,288
NYGASD	70032014	Dir Strategic Communication	460 Corporate Affairs	460-Strategic Communications	Full Time	\$340	\$5,005	\$6,165	\$6,785	\$11,106	\$12,216	\$8,884	\$10,290	\$9,234	\$11,081	\$11,081	\$8,971	\$104,988
NYGASD	70032196	Lead Program Manager	160 Customer	160-Market Development	Full Time	\$1,577	\$2,390	\$1,619	\$2,868		\$143	\$48	\$390			\$52	\$92	\$9,285
NYGASD	70032661	Lead Sales Representative	160 Customer	160-Sales & Program Operations	Full Time	\$743												\$743
NYGASD	70046635	Dir Sales	160 Customer	160-Sales & Program Operations	Full Time													\$811
NYGASD	70046811	Manager	330-Total US IS	330-US IS	Full Time													\$1,976
NYGASD	70046840	Exec Advisor	160 Customer	160-Customer Leader	Full Time	\$157	\$291	\$307	\$353	\$245	\$347	\$256	\$336	\$341	\$366	\$293	\$348	\$2,641
NYGASD	70048190	Lead Analyst	160 Customer	160-Market Development	Full Time													\$571
NYGASD	70048413	Engineer Manager	160 Customer	160-Sales & Program Operations	Full Time													\$2,946
NYGASD	70051586	Dir Program Strategy	160 Customer	160-Market Development	Full Time	\$968	\$3,091	\$3,457	\$2,766	\$2,766	\$3,579	\$3,147	\$1,878	\$2,311	\$1,444	\$1,444	\$1,444	\$32,466
NYGASD	70051980	Lead Program Manager	160 Customer	160-Sales & Program Operations	Full Time													\$878
NYGASD	70052823	Sr Sales Representative	160 Customer	160-Sales & Program Operations	Full Time													\$2,740
NYGASD	70053010	Manager	160 Customer	160-Customer Assurance	Full Time													\$2,740
NYGASD	70053795	Manager	160 Customer	160-Market Development	Full Time	\$3,325	\$1,036	\$1,036	\$981	\$1,036	\$1,090	\$1,067	\$907	\$472	\$1,174	\$960	\$1,174	\$14,228
NYGASD	70053799	Lead Program Manager	160 Customer	180-VP New Energy Solutions	Full Time	\$621	\$2,402	\$3,030	\$3,379	\$2,020	\$2,563	\$2,299	\$2,044	\$1,258	\$228	\$258	\$258	\$16,515
NYGASD	70054601	Lead Analyst	180-New Energy Solutions	160-Market Development	Full Time													\$1,174
NYGASD	70054878	Lead Planner	160 Customer	110-Electric Process & Engineering	Full Time	\$152	\$74											\$226
NYGASD	70063831	SVP Chief Customer Officer	200-Exec Director-US	200-Shaping the Future	Full Time	\$279	\$47	\$525	\$652	\$121	\$1,076	\$621	\$375	\$489	\$199	\$33	\$65	\$4,724
NYGASD	70064262	Acting Coordinator	160 Customer	160-Customer Assurance	Full Time													\$0
NYGASD	70065318	Analyst	160 Customer	160-Advanced Data & Analytics	Full Time													\$79
NYGASD	70065471	Lead Analyst	160 Customer	160-Market Development	Full Time	\$239	\$6,804	\$462	\$531	\$462	\$613	\$514	\$428	\$500	\$497	\$462	\$386	\$5,502
NYGASD	70065763	Sr Specialist	160 Customer	160-Market Development	Full Time	\$210	\$438	\$462	\$531	\$462	\$613	\$514	\$428	\$500	\$497	\$462	\$386	\$4,737
NYGASD	70066620	Sr Engineer	160 Customer	160-Market Development	Full Time													\$473
NYGASD	70071341	VP New Energy Solutions	160 Customer	180-VP New Energy Solutions	Full Time													\$386
NYGASD	70071560	Lead Analyst	160 Customer	160-Customer Assurance	Full Time													\$741
NYGASD	70073142	Sr Analyst	160 Customer	160-Sales & Program Operations	Full Time	\$1,546	\$845	\$1,190	\$1,935	\$1,493	\$1,443	\$896	\$1,316	\$1,963	\$1,651	\$1,504	\$1,504	\$17,371
NYGASD	70073192	Lead Analyst	160 Customer	160-Sales & Program Operations	Full Time	\$2,694	\$1,122	\$4,135	\$4,826	\$4,265	\$4,265	\$4,265	\$4,843	\$4,152	\$4,497	\$4,497	\$4,806	\$47,386
NYGASD	70073206	Sr Sales Representative	160 Customer	160-Sales & Program Operations	Full Time	\$544	\$145											\$544
NYGASD	70073328	Sr Engineer	160 Customer	160-Market Development	Full Time													\$288
NYGASD	70073433	Analyst	180-New Energy Solutions	160-Market Development	Full Time													\$1,021
NYGASD	70073487	Supv Non Operations	330-Total US IS	330-Shared Services	Full Time													\$661
NYGASD	70073490	Lead Engineer	160 Customer	160-Market Development	Full Time													\$0
NYGASD	70073593	Analyst	180-New Energy Solutions	160-Market Development	Full Time	\$719	\$1,315	\$1,717	\$695	\$695	\$899	\$858	\$595	\$670	\$707	\$781	\$744	\$9,081
NYGASD	70073656	Lead Program Manager	160 Customer	210-IRL Executive-NY	Full Time	\$1,315	\$1,315	\$1,079	\$1,182	\$1,028	\$1,130	\$925	\$1,034	\$1,162	\$650	\$507	\$1,021	\$10,821
NYGASD	70073807	Sr Sales Representative	160 Customer	160-Sales & Program Operations	Full Time	\$1,562	\$575	\$609	\$863	\$699	\$822	\$1,174	\$1,655	\$1,497	\$993	\$426	\$1,418	\$12,853
NYGASD	70082214	Lead Analyst	160 Customer	160-Customer Assurance	Full Time	\$152	\$208	\$230	\$197	\$164	\$241	\$230	\$182	\$193	\$232	\$238	\$204	\$2,471
NYGASD	70082214	Not assigned	160 Customer	160-Process & Performance	Full Time													\$162
NYGASD	70083554	Sr Analyst	160 Customer	160-Advanced Data & Analytics	Full Time													\$234
NYGASD	70083554	Manager	200-Exec Director-US	160-Advanced Data & Analytics	Full Time	\$1,295	\$104		\$2	\$2								\$15
NYGASD	70083554	VP Sales & Sales Operations	160 Customer	160-Sales & Program Operations	Full Time	\$224	\$545	\$331	\$207	\$380	\$285	\$382	\$334	\$519	\$484	\$444	\$418	\$4,118
NYGASD	70084811	Manager	160 Customer	160-Advanced Data & Analytics	Full Time													\$731
NYGASD	70084811	Not assigned	160 Customer	160-Market Development	Full Time													\$1,254
NYGASD	70084811	Dir Adv Data Analytics	160 Customer	160-Advanced Data & Analytics	Full Time	\$228	\$322	\$398	\$403	\$351	\$386	\$355						\$2,123
NYGASD	70084811	Lead Analyst	160 Customer	160-Customer Assurance	Full Time	\$67	\$60											\$127
NYGASD	70084811	Dir Customer Assurance	160 Customer	160-Customer Assurance	Full Time	\$79	\$119	\$84	\$39	\$79	\$92	\$131	\$128	\$134	\$81	\$128	\$108	\$1,201
NYGASD	70084811	Sr Analyst	160 Customer	1														

NYGASD	72010030	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$544	\$73	(973)												\$544	\$290
NYGASD	72010315	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$2,613		(82,323)		\$43	\$43	\$43	\$43	\$43	\$43	\$43	\$43	\$43	\$43	\$544	\$290
NYGASD	72010499	Analyst	160-Customer	160-Customer Engagement	Full Time	\$20	\$13													\$120	\$152
NYGASD	72012148	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$385	\$3,654		\$12	\$1,827	\$5,193	\$2,019	\$2,070	\$1,676	\$2,070	\$2,070	\$2,022	\$22,296	\$152	\$152	
NYGASD	72012507	Sr Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$152														\$247	\$247
NYGASD	72013721	Sr Project Manager - Ops	160-Customer	160-Process & Performance	Full Time				\$32	\$29	\$27	\$24	\$26	\$25	\$29	\$28	\$26	\$26	\$247	\$247	
NYGASD	72013753	Category Manager	450-Global Procurement	450-Procurement Strategy	Full Time														\$409	\$245	
NYGASD	72014134	Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time				\$17	\$3	\$32	\$36	\$31	\$36	\$36	\$36	\$36	\$36	\$247	\$247	
NYGASD	72014227	Sr Sales Representative	200-Esec Director-US	160-Advanced Data & Analytics	Full Time				\$17	\$30	\$19								\$212	\$67	
NYGASD	72014277	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$69	\$27	\$54	\$4	\$62			\$2	\$2	\$4	\$2	\$17	\$2	\$33	\$33	
NYGASD	72014347	Analyst	160-Customer	160-Market Development	Full Time											\$18	\$18		\$18	\$18	
NYGASD	72014715	Intern	160-Customer	160-Market Development	Part Time						\$438	\$594	\$365	\$105	\$63	\$272	\$17		\$1,835	\$1,835	
NYGASD	72017186	Manager	160-Customer	450-Global Procurement	Part Time					\$48	\$65								\$13	\$13	
NYGASD	72017186	Manager	160-Customer	160-Advanced Data & Analytics	Full Time						\$27	\$55	\$67	\$52	\$61	\$58	\$13		\$18	\$18	
NYGASD	72017590	Sr Analyst	200-Esec Director-US	160-Advanced Data & Analytics	Full Time														\$320	\$320	
NYGASD	72017846	Analyst	160-Customer	160-Market Development	Full Time	\$757	\$1,005	\$952	\$1,655	\$1,493	\$1,082	\$1,112	\$738	\$1,286	\$1,164	\$1,164	\$1,041	\$1,041	\$14,666	\$14,666	
NYGASD	72019483	Dlr Customer Engagement	160-Customer	160-Market Development	Full Time	\$430	\$709	\$1,152	\$1,019	\$886	\$975	\$933	\$1,099	\$3,438	\$1,717	\$2,076	\$1,002	\$1,002	\$16,336	\$16,336	
NYGASD	72019936	Analyst	160-Customer	160-Customer Engagement	Full Time			\$6	(56)		\$212	\$217	\$261	\$231	\$515	\$289	\$59	\$1,297	\$250	\$0	
NYGASD	72020608	Project Manager - Ops	180-New Energy Solutions	180-VP New Energy Solutions	Full Time														\$17	\$17	
NYGASD	72020680	Seasonal Intern	160-Customer	160-Customer Engagement	Full Time						\$95	\$78	\$78	\$41					\$17	\$292	
NYGASD	72020681	Seasonal Intern	180-New Energy Solutions	180-VP New Energy Solutions	Part Time														\$445	\$445	
NYGASD	72021158	Lead Analyst	160-Customer	160-Market Development	Full Time					\$149	\$1,040	\$999	\$952	\$999	\$1,047	\$714	\$714	\$2,960	\$2,960		
NYGASD	72022024	Specialist	160-Customer	160-Customer Engagement	Full Time									\$3	(53)			\$20	\$60	\$0	
NYGASD	72022049	Sr Analyst	160-Customer	160-Customer Engagement	Full Time														\$0	\$0	
NIMO Gas Total						\$64,888	\$75,557	\$55,258	\$72,855	\$70,669	\$81,388	\$76,955	\$74,271	\$71,901	\$71,636	\$78,632	\$68,317	\$864,327			
				Employee Count		90	89	92	104	102	111	109	109	112	110	105	113	104			

(1) **Recovered in Base Rates.**

Date of Request: June 7, 2017
Due Date: June 19, 2017

Request No. DPS-281 LMR-6
NMPC Req. No. NM-744

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Lisa Rosi

TO: National Grid, Electric Customer Panel

SUBJECT: **ENERGY EFFICIENCY EXPENSE RECONCILIATION**

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

1. For both electric and gas energy efficiency programs, provide the reconciliation of the energy efficiency costs that NMPC proposes to move to base rates to the proposed shifts provided in the Company's 2017 – 2020 Energy Efficiency Transition Implementation Plan (ETIP) filed on June 1, 2017.
2. Explain why the Portfolio Administration budget decreased from 2017 to 2018 in the ETIP, but not by the amount proposed for labor in the above-referenced cases.
3. Explain why the Evaluation, Measurement and Verification (EM&V) budget in the ETIP decreases from 2017 to 2018, but not by the amount proposed for EM&V in the above-referenced cases.

Response:

1. Attachment 1 contains the reconciliation of the proposed shift in electric and gas energy efficiency costs from the 2017 ETIP budgets to base rates and the resulting budgets for the 2018 ETIP.
2. As shown in Attachment 1, the Portfolio Administration 2017 ETIP budget contained only a portion of the labor costs (\$2.100 million for electric and \$1.140 million for gas) that will be transferred to base rates under the Company's proposal. The remaining labor costs (\$2.500 million for electric and \$0.660 million for gas) are contained in Total Program Costs.

Attachment 1 shows the remaining differences between the Portfolio Administration budget for 2017 and 2018.

3. As shown in Attachment 1, the 2018 EM&V ETIP budget contains a small portion of labor costs for the period of January through March 2018 (prior to the start of the Rate Year).

Name of Respondent:
Lisa Tallet

Date of Reply:
June 19, 2017

Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238 & Case 17-G-0239
Attachment 1 to DPS-281 LMR-6
Page 1 of 1

Niagara Mohawk-Electric Spending Budgets (in Millions \$)

	2017	Costs Shifted from Electric ETIP to Base Rates						2018
	ETIP	Labor Costs	EM&V	E-Commerce	ETIP Refill (1)	Other (2), (4)	Rounding (3)	ETIP
Total Program Costs	44.510	(2.500)		(3.260)	10.270	0.160		49.180
Portfolio Admin	4.410	(2.100)		(0.380)	0.570	(0.240)		2.260
EM&V	2.540		(2.600)			0.020	0.060	0.020
Total Portfolio	51.460	(4.600)	(2.600)	(3.640)	10.840	(0.060)	0.060	51.460

(1) Includes new activities for Tiered Incentives, Midstream Pilot Expansion Program, Partnership Programs, Vendor Procurement and IT Support.

Breakdown of ETIP Refill Activities (in Millions \$):

Tiered Incentives	5.060
Midstream Pilot	2.500
Partnership	3.000
Vendor Procurement	0.150
IT Support	0.130
	<u>10.840</u>

(2) Represents shifting of funds between budget categories for planned EE programs (2017 to 2018).

(3) The EM&V budget generally represents 5% of the Total Portfolio budget.

(4) The 2018 EM&V ETIP budget includes labor dollars for the period of January through March 2018.

Niagara Mohawk-Gas Spending Budgets (in Millions \$)

	2017	Costs Shifted from Gas ETIP to Base Rates						2018
	ETIP	Labor Costs	EM&V	E-Commerce	ETIP Refill (1)	Rounding (2)		ETIP
Total Program Costs	8.053	(0.660)		(0.940)	3.310	0.004		9.767
Portfolio Admin	1.969	(1.140)		(0.197)	0.155	(0.005)		0.782
EV&M	0.527		(0.528)			0.001		0.000
Total Portfolio	10.549	(1.800)	(0.528)	(1.137)	3.465	0.000		10.549

(1) Includes new activities for Tiered Incentives, Midstream Pilot Expansion Program, Partnership Programs, Vendor Procurement and IT Support.

Breakdown of ETIP Refill Activities (in Millions \$):

Tiered Incentives	1.000
Midstream Pilot	1.000
Partnership	1.395
Vendor Procurement	0.050
IT Support	0.020
	<u>3.465</u>

(2) Rounding of costs to three decimal places.

Date of Request: June 9, 2017
Due Date: June 19, 2017

Request No. DPS-325 RAC-3
NMPC Req. No. NM-804

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Robert Cully
TO: National Grid, Electric Customer Panel
SUBJECT: ***DEMONSTRATION PROJECTS***

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

The Order Adopting Regulatory Policy Framework and Implementation Plan, issued February 26, 2015 in Case 14-M-0101 (Track One Order) authorizes ratepayer support for all demonstration projects up to 0.5% of NMPC's delivery service revenue requirement or the revenue requirement associated with capital expenditures up to \$10 million, whichever is greater.

1. Provide Niagara Mohawk's Demonstration Project budget authorized by the Commission. Provide any workpapers used to develop the Demonstration Projects budget.
2. Provide a forecast for the Rate Year, Data Year 1, and Data Year 2 of expenditures related to the Fruit Belt Neighborhood Solar, Potsdam Community Resilience, Distributed System Platform (Buffalo Niagara Medical Campus), and Clifton Park Demand Reduction projects, broken out by project.
3. Provide a forecast of expenditures related to the Smart Home Rates and Distributed Generation Interconnection projects as of March 31, 2018, broken out by project.
4. Provide a forecast for the Rate Year, Data Year 1, and Data Year 2 of expenditures related to the Smart Home Rate and Distributed Generation Interconnection projects, broken out by project.

5. Provide a forecast of the remaining balance of the Demonstration Project budget after accounting for all forecast costs of the Fruit Belt Neighborhood Solar, Potsdam Community Resilience, Distributed System Platform (Buffalo Niagara Medical Campus), Clifton Park Demand Reduction, Smart Home Rate, and Interconnection projects.
6. Provide a forecast of expenditures related to the Schenectady Smart City project as of March 31, 2018.
7. Provide a forecast for the Rate Year, Data Year 1, and Data Year 2 of expenditures related to the Schenectady Smart City project.

Response:

1. Below is a summary table of the budgets for the Company's REV Demonstration Projects.

Project Name	Capital	O&M	Total
Demand Reduction (Clifton Park)	\$ 10,453,176	\$ 16,366,160	\$ 26,819,336
Distributed System Platform (DSP)	\$ 4,425,000	\$ 645,000	\$ 5,070,000
Neighborhood Solar (Fruit Belt)	\$ 1,410,000	\$ 2,382,200	\$ 3,792,200
Community Resilience - Potsdam	\$ -	\$ 1,606,000	\$ 1,606,000

The Company developed the budget for each project and filed it as part of the respective implementation plans in Case 14-M-0101. The implementation plans are included as Attachment 1.

2. For the forecast capital costs of the Company's REV Demonstration projects, please refer to Exhibit ____(RRP-11), Workpapers for Exhibit ____(RRP-7), Schedule 1, Workpaper 8.

For the forecast O&M costs of the Company's REV Demonstration Projects, please refer to Exhibit ____(RRP-3), Schedule 27, Page 9 of 10. The REV Demonstration Projects can be found in the section labeled "Electric REV Demonstration Projects."

3 and 4.

Smart Home Rate Project

Below is a forecast of costs for the Smart Home Rate project for FY18 through FY21. The project was initially filed with the Commission on February 1, 2017 and was approved by Staff on June 6, 2017. The Company's filing is provided as Attachment 2. Below is a summary table of the forecast budget for the Smart Home Rate project.

		FY18	FY19	FY20	FY21
Smart Home Rate Project	Capital				
	O&M	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	Total	\$ 397,500	\$ 298,125	\$ 99,375	\$ -

With regard to the forecast budget, please note the following:

- The project is still in the planning phases and the Company has not yet signed contracts with any vendors.
- The project assumes the high estimate noted in the Company's February 1, 2017 Smart Home Rate Project (Attachment 2).
- The project assumes that the Company incurs the voice recognition technology and smart thermostat costs in the next three fiscal years (FY18-FY20).
- The project assumes that half of the customer adoptions of the Smart Home Rate will occur in FY18 due to a strong marketing campaign, and that adoption rates will diminish over time.

As discussed in the Company's Electric Customer Panel direct testimony (page 20 of 84), the costs of the Smart Home Rate Project are not included in the Company's revenue requirement. The Company proposes to defer these costs consistent with the current demonstration project framework.

Distributed Generation Interconnection Project

Below is a forecast of costs for the Distributed Generation Interconnection Project for FY18 through FY21. The Company filed this project with the Commission in Case 14-M-0101 on February 14, 2017. The project was approved by Staff on April 24, 2017. The costs noted below were derived from the Company's Distributed Generation Interconnection implementation plan, filed with the Commission in Case 14-M-0101 on May 24, 2017, a copy of which is included as Attachment 3. Under the project, the Company is seeking to recoup investment costs from developers who interconnect DG systems above 50 kW in the Demonstration Areas. Cost recovery is explained in Attachment 3.

		FY18	FY19	FY20	FY21
Distributed Generation Interconnection Project	Capital	\$ 1,425,800	\$ 40,000		
	O&M	\$ 12,000	\$ 8,000	\$ -	\$ -
	Total	\$ 1,437,800	\$ 48,000	\$ -	\$ -

5.

Please see Attachment 4. Attachment 4 reflects an estimate of the remaining revenue requirement balance under the cap for the Neighborhood Solar (Fruit Belt), Community Resilience (Potsdam), Distributed System Platform (Buffalo Niagara Medical Campus), Demand Reduction (Clifton Park) and Smart Home Rate projects.

Because the Distributed Generation Interconnection Project is a self-funded program, the costs for the program are not included in the estimate of the remaining revenue requirement cap.

6 and 7.

As discussed in the Electric Customer Panel's testimony, the Schenectady Smart City project is still being developed. Therefore, the Company does not have a forecast of costs for this project at this time. The Company proposes to defer the costs associated with the program consistent with the current demonstration project framework.

Name of Respondent:

Nick Corsetti

Date of Reply:

June 19, 2017



**Implementation Plan for
Fruit Belt Neighborhood Solar
REV Demonstration
in Buffalo, New York**

January 4, 2016

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Executive Summary

The Fruit Belt Neighborhood Solar REV Demonstration Project to be implemented by Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid” or the “Company”) (the “Demonstration”) is a solar energy initiative that will primarily deliver two main types of benefits: energy bill savings for low-to-moderate income (“LMI”) customers, and grid efficiency benefits for the local distribution system. Through physically concentrating 100 rooftop solar photovoltaic (“PV”) systems within a local neighborhood, the Demonstration not only provides the technical conditions necessary for exploring grid efficiency, but also allows for the opportunity to engage the residential community as a whole, which will strengthen relationships and foster energy awareness.

The Demonstration will test the following hypotheses:

- Providing solar bill credits to participants in an LMI neighborhood, as well as offering energy efficiency to further drive energy bill savings, will have a positive impact on bill payment behavior and enable customers to better manage their arrears.
- Concentrating distributed solar PV resources with reactive power support within a boundary served by a common substation versus scattered deployment of conventional solar will deliver measurable grid efficiency benefits.

Customer Benefits

The Demonstration model of “in front of the meter” solar and utility ownership removes existing barriers for LMI residential customers to participate in the solar market today. To take advantage of most solar market offers, customers need to have good credit standing and income levels that allow receipt of tax credits, leaving LMI neighborhoods like the Fruit Belt underserved by the market. This Demonstration will unlock the benefits of solar, and additionally connect customers to energy efficiency, at no-cost to participants, clearing traditional financing obstacles.

The opt-in approach to the Demonstration will enroll up to a total of 300 participants at no cost and on a first-come, first-served basis. To participate, interested Fruit Belt Neighborhood (“Fruit Belt”) customers must meet eligibility requirements based on active status of their National Grid electric account, location of residency within neighborhood boundaries, and residence in a dwelling of 1-4 units (*i.e.*, up to a “four-family house”). Participants’ National Grid electric accounts may be either in good standing or in arrears; enrollment of the latter will be necessary for the Demonstration to

meet its goal of testing whether its delivered benefits enable customers in arrears to improve their bill payment behavior and better manage their arrearages.

Energy bill savings will be delivered to Demonstration participants in the Fruit Belt through installing rooftop solar on 100 homes (Tier I); extending the monetary credit produced by the solar generation to customers that are interested, but may not be eligible to host solar (Tier II); and connecting all interested participants to energy efficiency (“EE”) services by leveraging existing New York State Energy Research and Development Authority (“NYSERDA”) and/or other available offerings, whether or not their roof qualifies to host solar (Tier III). All benefits are at no cost to participants and are based on the participant tier structure summarized below:

	Tier I	Tier II	Tier III
Customer Benefits	100 Participants	50 Participants	Additional 150 Participants
Energy Efficiency Services	✓	✓	✓
Rooftop Solar Engineering Assessment	✓	✓	✓
Solar Bill Credits	✓	✓	
Rooftop Solar PV System	✓		
Minor Roof & Electric Panel Repairs (if needed)	✓		

The energy produced by the 100 solar units will be captured in front of the utility meter, aggregated collectively, and monetized. The monetary credit for the totalized generation will then be redistributed equally among Tier I and Tier II residential electric accounts, for a total of 150 participants receiving solar bill credits that will appear as a credit line item on each account’s respective monthly electric bills. Assuming that each rooftop solar system is sized at 5 kW, the projected average monthly solar bill credit is expected to be approximately \$15-20 per participant for the 150 customers in Tiers I and II.

National Grid hypothesizes that providing solar credits to participants in a LMI neighborhood, as well as offering EE services to further drive bill savings, will have a positive impact on bill payment behavior and enable better management of arrears. The Company will assess the following metrics:

(1) Average Solar Bill Credit;

(2) Collection Rate determined by $\frac{\text{Total customer payments } [\$]}{\text{Total available to collect } [\$]}$; and

(3) Arrears Change Rate measured by $\frac{\text{Initial period arrears } [\$] - \text{Final period arrears } [\$]}{\text{Initial period arrears } [\$]}$.

Grid Efficiency Benefits

Physically installing solar assets within a concentrated geographic area and along a common electric feeder close to the load provides an opportunity to explore grid efficiency benefits. Concentrating distributed solar resources within a boundary served by a common substation, as opposed to scattered deployment scenarios of community solar based on large arrays, will deliver measurable grid efficiency benefits. This Demonstration will test for: (1) reduction of energy losses; (2) improved voltage monitoring and control; and (3) the monitoring and control of reactive power.

Micro-inverters will be utilized in the Demonstration such that each solar panel will have its own DC to AC micro-inverter. This will allow the system to be more resistant to effects of partial shading and will remove the concern of higher-voltage DC wiring on residential roofs. Micro-inverter usage will allow for reactive power generation when the panels are not producing real power at their maximum output (*i.e.*, mornings, evenings, nights, or cloudy days). This capability will improve the power factor at each home with rooftop solar and on the distribution circuit and will result in improved upstream system efficiencies. There will be multiple power factor control methods employed to test the effectiveness of each to compare the resulting efficiency benefits and the projected costs.

Outreach and Engagement Efforts

National Grid designed the Demonstration with the Buffalo Niagara Medical Campus, Inc. ("BNMC"), its trusted customer partner. The Fruit Belt is a LMI neighborhood, located within the City of Buffalo, comprised of just under 2,000 residents located adjacent to the BNMC. The BNMC has well-established relationships with its surrounding neighborhoods, which makes it uniquely qualified to partner with National Grid in outreach to the Fruit Belt for this Demonstration. Customer/stakeholder engagement and communications will be a three-phased approach focusing on awareness, enrollment, and installation. A comprehensive and collaborative mix of traditional grassroots engagement, marketing, public relations, and media relations will be utilized. The primary goal of the outreach is to increase awareness and educate customers of the benefits to encourage participation.

Demonstration Project Benefit and Cost Summary

Totals	Year 1	Year 2	Years 3-25	Total
Value of Benefits	\$120,750	\$134,550	\$2,277,150	\$2,532,450
Tax Credits	\$715,584	\$0	\$0	\$715,584
Expenditures	\$3,502,200	\$240,000	\$50,000	\$3,792,200
Net Cash Flow	-\$2,786,616	-\$240,000	-\$50,000	-\$3,076,616
Net Benefit to Cost	-\$2,665,866	-\$105,450	\$2,227,150	-\$544,166

Key Dates and Milestones

- Dec. 12, 2014: REV Demonstration Projects Announced
- Jul. 1, 2015: Fruit Belt Neighborhood Solar REV Demonstration Filed with the New York Public Service Commission (“Commission”)
- Aug. 3, 2015: Approval of Fruit Belt Neighborhood Solar REV Demonstration
- Nov. 1, 2015: Demonstration starts
- Dec. 1, 2015: Customer enrollment initiated
- Apr. 1, 2016: Billing system ready
- Aug. 15, 2016: Selection of 100 solar host sites completed
- Nov. 1, 2016: All 100 solar PV systems installed

Scalability and Innovation

The Demonstration is ultimately intended to test the potential for scalability across similar communities in National Grid’s service territory – serving as a “first of its kind” model versus “one of a kind.” Its approach to concentrate distributed energy resources (“DER”), including solar and energy efficiency, provides a non-wires alternative strategy while engaging the community as a whole.

Additionally, National Grid views this Demonstration as advancing its US Connect21 Strategy, which seeks to transform National Grid’s electricity and natural gas networks to support the 21st century digital economy with smarter, cleaner, and more resilient energy solutions. This Demonstration supports many of the Connect21 goals, particularly focusing on energy efficiency and placing renewables where it makes the most sense.

Demonstration Design

Customer Benefits

Neighborhood History and Demographics

The Demonstration will seek participants that are residential electric customers of National Grid located within the Fruit Belt. Adjacent to the BNMC, the Fruit Belt comprises approximately 130 acres and roughly 36 city blocks (Figure 1).

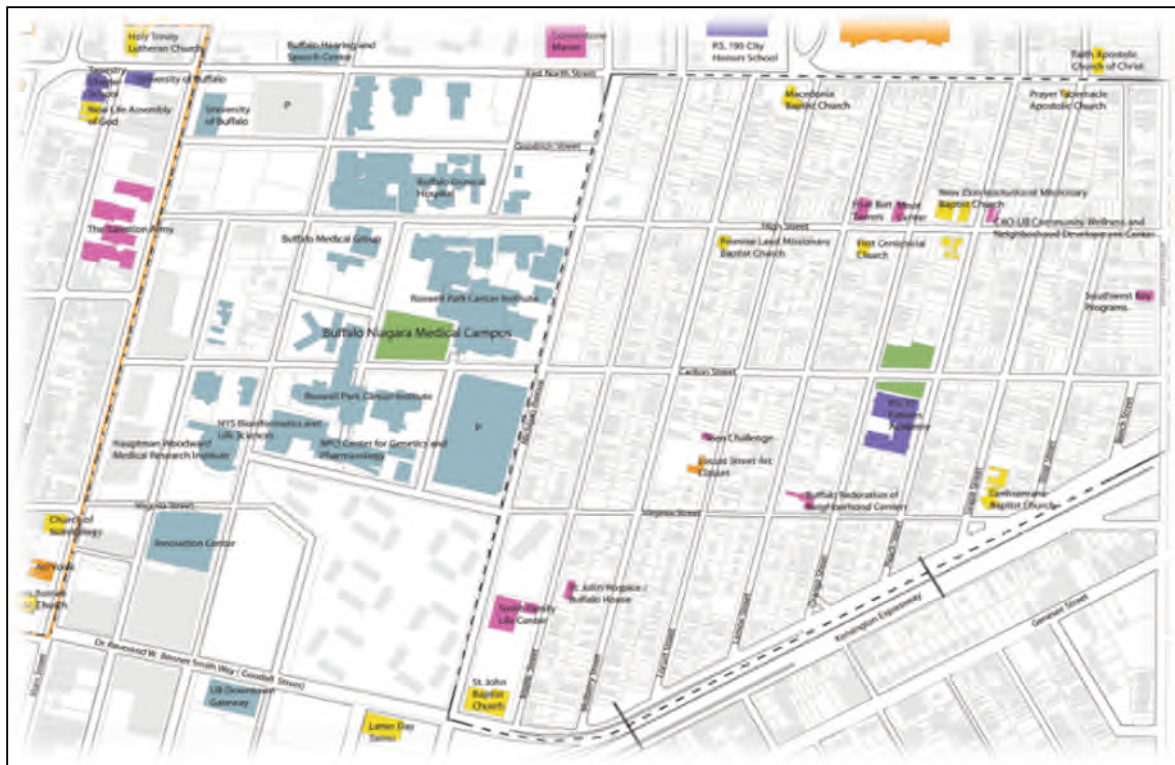


Figure 1: Map Showing the Fruit Belt Neighborhood (right) and the BNMC (left)

The Fruit Belt neighborhood is a mixed-use community of single and multifamily homes, schools, and community centers. The average household income is approximately \$23,000, which is less than half of the Buffalo area median income of \$46,000,¹ characterizing the neighborhood as LMI. There are about 7,000 National Grid residential electric accounts in the neighborhood, 39% of which carry an arrears balance.²

¹ Buffalo Niagara Medical Campus with Sasaki Associates and Madden Planning Group, March 2009, Fruit Belt Neighborhood Strategy, Figure 6 Educational Attainment, pg. 6

² Based on internal analysis with data from National Grid's customer billing system.

Approximately 41% of the homes in the Fruit Belt are owner-occupied³, which is slightly lower than 44% for Buffalo overall.⁴

As an LMI neighborhood, the Fruit Belt is currently underserved by the solar market. To take advantage of most solar market offers, customers need to have good credit standing and income levels that allow receipt of tax credits, leaving LMI neighborhoods like the Fruit Belt underserved. Currently, there is a single rooftop solar array installed in the neighborhood donated by Solar Liberty to the Buffalo City Mission, an inter-faith institution.

Customer Benefits

LMI residents tend to pay a higher share of their disposable income toward their energy bills. For this reason, the primary customer benefit that the Demonstration aims to deliver is energy bill savings, thereby easing some of the burden on managing a tight household budget.

Energy bill savings will be delivered to Demonstration participants in the Fruit Belt through: (1) installing rooftop solar on 100 homes; (2) extending the monetary credit produced by the solar generation to an additional group of customers that are interested, but may not be eligible to host solar; and (3) connecting all interested participants to EE services by leveraging existing NYSERDA and/or other available offerings, whether or not their roof qualifies to host solar.

Beyond the primary customer benefit of energy bill savings, the Demonstration expects to garner several secondary benefits for participating customers, including:

- Enhanced customer knowledge of the energy bill: EE services offered to all participant tiers will allow customers to better understand their energy usage and ways to reduce their energy consumption.
- Leveraged benefits and awareness of additional local and state programs: Through NYSERDA's EmPower New York Program⁵, (Assisted) Home Performance with ENERGY STAR® Program and Green Jobs – Green New York Program participating customers will further benefit from leveraged Weatherization Assistance Program funding to identify and address any existing or potential health and safety hazards in the home. Furthermore, participating

³ Census 2000 Summary File 1 (SF-1) 100-Percent Data, GCT-H6. Occupied Housing Characteristics.

⁴ 2006 American Community Survey; S2501. Occupancy Characteristics.

⁵ The Demonstration assumes NYSERDA will continue to administer the EmPower New York Program. However, the Commission's December 11, 2015 *Order Extending Clean Energy Programs* in Cases 14-M-0094, *et al.*, authorizes NYSERDA to continue to implement Energy Efficiency Portfolio Standard ("EEPS") programs only through February 29, 2016 while the Commission completes its review of the Clean Energy Fund ("CEF") proposal.

customers whose homes have health and safety issues that fall outside the scope and/or budget of the Demonstration (e.g., need for roof replacement, lead paint and/or asbestos abatement needs, major structural issues, etc.) will be referred to existing City of Buffalo programs to determine eligibility for additional assistance.

- **Community focus:** The neighborhood approach of the Demonstration stands to gain a greater level of customer engagement than a traditional customer-by-customer approach by taking into account the needs and resources of the Fruit Belt community as a whole.
- **Local jobs:** The Demonstration garners regional and state-wide workforce development benefits by engaging committed vendor partners based in Buffalo, the region, and the greater New York State area. Furthermore, local solar installation partner Solar Liberty is committed to train and employ up to 5 residents of the Fruit Belt neighborhood through a workforce development initiative as part of this Demonstration.

Participant Tiers and Eligibility

Eligibility

Participation in the Demonstration is opt-in. All Fruit Belt residents interested in participating must meet the following underlying criteria:

1. Have an active National Grid account billed under the SC1 residential rate class for electric service;
2. Live in a residence located within the Fruit Belt as defined by the boundaries of E. North Street to the north, Jefferson Avenue to the east; Kensington Expressway to the south, and Michigan Avenue to the west; and
3. Live in a residence of 1-4 units (*i.e.*, up to a “four-family house”)

All residents meeting the above criteria, whether they lease or own their home, are eligible to participate as the primary criterion is having an active National Grid electric account. Renters will need to obtain written permission from their landlords. Energy bill savings will be received by the person who is the owner of the associated National Grid electric account, whether that is the renter or landlord. If a participant moves during the course of the Demonstration and disconnects their electric service, the solar bill credits stay with the meter, and the subsequent National Grid account owner would receive the solar bill credits going forward.

This Demonstration is designed to accommodate single-family style homes as well as dwellings that contain up to 4 units. Residents living in multifamily properties of 5 or more units are not eligible to participate in the Demonstration.

Customers' National Grid account payment history and current account standing will not affect their eligibility to participate. In fact, it will be necessary to enlist a minimum of 35 participants that have accounts with an arrears balance in order for the Demonstration to meet its goal of testing whether its delivered benefits enable customers in arrears to improve their bill payment behavior and better manage their arrearages. However, in order not to penalize customers with accounts in good standing, all customers are eligible to participate as long as they meet the criteria outlined above.

Participant Tiers and Selection Methodology

Demonstration participants will fit into one of three tiers, based on home eligibility for hosting rooftop solar as determined by a rooftop solar engineering assessment. The Demonstration aims to place all interested participants in Tier I by default, on a first-come, first-served basis. Customers will fit into Tiers II and III based on placing out of eligibility for hosting rooftop solar. All benefits offered are at no cost to the customer. The following table summarizes the participant tier structure.

	Tier I	Tier II	Tier III
Customer Benefits	100 Participants	50 Participants	Additional 150 Participants
Energy Efficiency Services	✓	✓	✓
Rooftop Solar Engineering Assessment	✓	✓	✓
Solar Bill Credits	✓	✓	
Rooftop Solar System	✓		
Minor Roof & Electric Panel Repairs (if needed)	✓		

With full participation in each tier, the Demonstration accommodates up to 300 participants, 150 of which, in Tiers I and II, will receive solar bill credits.

Benefits shared by all Tiers

All participants opting in to the Demonstration are assumed to be expressing interest in potentially hosting rooftop solar at their home (*i.e.*, seeking placement in Tier I). Therefore, all will receive a rooftop solar engineering assessment to determine eligibility for hosting solar. The assessment will consider multiple factors such as roof orientation, shading, structural ability to host solar PV panels, and condition of the home's electric panel. The assessment may result in immediate approval for homes deemed solar-ready or conditional approval for homes requiring minor roof and/or electric panel repairs. Alternatively, the assessment may determine that the home is not suitable to host solar. This may be due to reasons such as orientation, shading, or the need for major roof repairs (*e.g.*, roof replacement) for which the Demonstration has not

budgeted the required funding to address. In the case that a home is in need of major roof repair, the property owner will be referred to the City of Buffalo's Emergency Assistance Loan Program.

In addition to all participants receiving a solar rooftop engineering assessment, all will be encouraged to receive whole-home EE services through NYSEERDA's EmPower New York Program⁵, (Assisted) Home Performance with ENERGY STAR® Program and the Green Jobs – Green New York Program. The EmPower New York Program covers a wide range of energy efficiency measures (including insulation, air sealing, efficient lighting, refrigerator replacement, and more) that can deliver significant energy savings on customers' energy bills, both electric and heating (gas or oil). The program also provides a health and safety assessment. National Grid and NYSEERDA have teamed up to assist the Demonstration participants in receiving the maximum benefit from the various energy efficiency services available.

Tier I – “Solar Hosts”

For participants with homes suitable to host rooftop solar:

Benefits

- Energy efficiency services
- Rooftop solar engineering assessment
- Minor roof repairs or electric panel upgrades, if necessary (up to \$2,000 in total)
- Installation of a rooftop solar system
- Solar bill credits – The aggregated value of the 100 PV systems will be divided equally among solar hosts (Tier I) and an additional group of 50 participants (Tier II)

Selection

- Capped at 100 participants.
- Requires that the solar rooftop assessment results in either approval (solar-ready) or conditional approval to address up to \$2,000 in roof or electric panel repairs needed for the home to become solar-ready
- Selection on a first-come, first-served basis for solar-ready homes

Tier II – “Additional Solar Credit Participants”

For participants that expressed interest, but did not qualify for hosting solar:

Benefits

- Energy efficiency services
- Rooftop solar engineering assessment

Solar bill credits: The aggregated value of the 100 solar PV systems will be divided equally among solar hosts (Tier I) and an additional group of participants (Tier II)

Selection

- Capped at 50 participants: The cap allows a balance of extending the monetary benefit of the aggregated solar generation to participants whose roofs do not qualify, while not extending the credits to such a large group that the value becomes diluted. The cap preserves the ability for the solar credits to represent a meaningful portion of customers' electric bills.
- Selection will either be determined by a lottery for all participants that did not qualify for Tier I, or it will be determined on a first-come, first-served basis. The Company will determine which selection method to use after assessing the level of customer interest in participating in the Demonstration during the outreach and enrollment period.
- Customers may fall into Tier II instead of qualifying for Tier I due to:
 - Rooftop engineering assessment determination that the home is not suitable for solar
 - Rooftop engineering assessment determination that the home requires major roof and/or electric panel repair beyond the project's funding cap of \$2,000 (e.g., roof replacement) in order to be suitable to host solar
 - The premise owner not granting permission to install rooftop solar
 - In instances where the rooftop solar PV system is installed at a home of 2-4 units, one of the customers will be placed in Tier I, and the remainder of customers living under the same roof will be placed in Tier II (corresponding to the number of National Grid electric accounts at that address billed under the SC1 rate) by default.

Tier III – “Energy Efficiency Participants”

For all remaining participants that express interest in the Demonstration:

Benefits

- Energy efficiency services
- Rooftop solar engineering assessment

Selection

- Ability to accommodate up to 150 participants – The Demonstration has budgeted for up to 150 additional energy assessments for participants not receiving placement in Tiers I or II. While not a strict “cap” to fill, Tier III exists, at a minimum, to connect interested Fruit Belt residents to energy efficiency solutions offered through NYSERDA’s existing EmPower New York Program⁵, (Assisted) Home Performance with ENERGY STAR® Program and the Green Jobs – Green New York Program thereby providing a way for these customers to also receive energy bill savings.
- Reasons customers may fall into Tier III:
 - Tiers I and II had already reached full participation at their capped levels
 - Customers were not chosen through the lottery for Tier II (if a lottery system is deemed appropriate)
 - Customers were interested only in the energy efficiency offering of the Demonstration, and not interested in potentially hosting solar

NYSERDA Partnership: Energy Efficiency Services

National Grid will partner with NYSERDA to further reduce the energy burden of participants by integrating an energy efficiency component into the Demonstration. Participants in all tiers of the Demonstration will be enrolled in energy efficiency programs administered by NYSERDA. Participants that are eligible⁶ for the EmPower New York program will be provided with energy efficiency upgrades at no cost and with in-home energy education. Participants not income-eligible for EmPower New York will be provided information on how to participate in ENERGY STAR®’s (Assisted) Home Performance, to receive an energy audit through Green Jobs, Green New York, and to learn more about incentives available for energy efficiency improvements.

Beyond reducing participant energy burdens, the incorporation of energy efficiency in the Demonstration seeks to achieve greater carbon emission reductions, increased

⁶ To be eligible for the EmPower New York Program, a household’s annual income cannot exceed 60% of the State Median Income. In addition, work performed in rental properties will require the landlord’s approval.

system-wide efficiency, enhanced energy literacy for customers relative to understanding the elements of the energy bill, and reduction in arrearages. These measurable benefits are reflected in the first and second Test Statements in the Test Statement section.

The inclusion of energy efficiency will additionally allow exploration of potential operational efficiencies and savings that can be gained by potential partnerships to: (1) optimize customer intake channels; (2) strengthen outreach efforts; and to (3) aggregate the delivery of energy efficiency services at the community level in order to reduce costs and improve the quality of efficiency services. This model will serve to leverage National Grid and BNMC's existing relationships with the community as well as NYSERDA's efforts to increase energy affordability and access to clean energy solutions in LMI communities.

All participant tiers will benefit from the Demonstration project funding that will supplement the NYSERDA energy efficiency programs such as air sealing, insulation, electric base load reduction measures, and health and safety hazard mitigation to garner energy efficiency benefits. The Demonstration allocates a total of \$300,000, or \$1,000 per customer, across all participant tiers for this purpose. In addition, the Demonstration allocates a total of \$200,000, or \$2,000 per Tier I participant, to address minor to moderate structural issues and/or electric panel replacements that may present a barrier to a Tier I participant's home serving as a solar host site. Upon selection of all (100) Tier 1 participants and successful installation of all (100) solar PV units, any unutilized funding allocated for the remediation of minor to moderate structural issues and/or electric panel replacements for Tier 1 participants will be reallocated to supplement the energy efficiency services offered through the NYSERDA energy efficiency programs.

It should be noted that participant referrals and/or evaluations for additional energy efficiency services will not impede either an individual participant's consideration as a solar host or the Demonstration's customer enrollment targets.

How the Rooftop Solar Engineering Assessments Will Work

Solar Liberty, a locally-based solar installer, will be the partner conducting the rooftop solar engineering assessments that will determine participants' eligibility for Tier I (*i.e.*, hosting solar). Prior to arriving for the assessment, Solar Liberty's engineering team will have devised a site plan specific to each premise by utilizing proprietary software with the most up-to-date satellite imagery available. At the site visit, the team will confirm what was viewed via satellite imagery and utilize tools to assess tilt, orientation, and shading of the roof. The team will also perform a structural assessment to determine if

the roof is able to support solar as well as the home's electric panel, and whether any repair is needed for the home to be solar-ready.

As a locally based, customer-centric company, Solar Liberty can accommodate most customers' schedules and meet with the enrolled Demonstration participants at any time, including weekends. Analysis and engineering review will happen within 24 hours of the site visit. There are no seasonal factors (e.g., snow) that will limit site visits and analysis.

How the Solar Bill Credits Will Work

The energy produced by the 100 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 among the residential electric accounts of Tiers I and II, for a total of 150 participants receiving the solar bill credits. The generation revenue will be distributed as a credit on each account's respective electric bill.

Solar Generation Value

Conceptually, the Fruit Belt solar PV projects being installed will perform similarly to all new generation projects that come on-line in the National Grid service territory. All new generation that delivers power to National Grid is subject to the PSC 220 Tariff SC6 rules. Typically, these generation customers are paid hourly Real Time ("RT") New York Independent System Operator, Inc. ("NYISO") energy prices plus NYISO Installed Capacity ("ICAP") at the Spot Market prices each month. The hourly RT prices are based upon the closest electrical Point Identification ("PTID") in the NYISO system for each generator.

The Fruit Belt customers will receive the actual value of the solar generation on a lag basis. To achieve this, the actual hourly solar generation, actual hourly RT prices, and actual Spot Market ICAP prices will be used to calculate the actual value from the prior month. Resulting credits will be given to the customers the following month. This process is easy and straight-forward; however, this could cause large differences in what the customers would see as a monthly credit in July versus January. January days are subject to fewer daylight hours as well as extended periods of cloud or snow coverage. Thus, the proposal is to forecast the generation value over a 12-month forward period, and levelize the monthly credits to customers in order to eliminate the seasonal volatility in the generation and market prices. In addition, the actual solar generation valuation would be calculated each month and these differences would be added (subtracted) to the forecasted, 12 month levelized credits. Overall, customers would see a relatively stable monthly credit and the true benefits would be borne by the Fruit Belt customers. Since the benefits and reconciliations are performed over a 12-month, forward period, actual monthly timing differences in the commodity

reconciliations would flow through the existing Electric Supply Reconciliation Mechanism (“ESRM”) process (as explained further in section 4 herein).

Forecasting the Solar Generation Value

The market price data that is currently used in the monthly commodity rate-setting process for the mass market customers, Rule 46.1, will be used to determine the forecast solar generation value each month. In addition, a monthly forecast of the solar generation, either monthly or hourly, will be required to determine the market value. Currently, an on-line solar simulator based on Buffalo weather is used to develop an hourly generation profile for a 1 kW solar panel. This generation profile was then scaled up to the 500 kW project size. This method of developing the hourly profile can be adjusted as actual data is gathered from these Fruit Belt installations. An example calculation is shown in Figure 2. The volatility in the monthly credit is significant due to seasonality associated with both the solar generation and market prices. However, the average credit for a 12-month period can be expected to be approximately \$15 for each of the 150 customers. This is based upon current market price forecasts for 2016 in NYISO Zone A.

Fruit Belt Solar Credit Calculator - Forecast 2016										22-Oct-15		
Installed Solar Size 500 kW								Accounts to Credit 150				
ICAP Capacity (Summer) 372 kW (calculated)												
ICAP Capacity (Winter) 345 kW (calculated)												
EFOR'd 85.0%												
								Energy &				
Day Ahead Energy		Monthly			Solar PV		Ancillary	ICAP	Total \$	Credit per		
Month	OnPeak	OffPeak	Ancillary	ICAP	1 - EFOR'd	kWhs	Value	Value	Value	Account		
Jan-2016	1	52.20	38.78	1.67	1.31	15.0%	27,778	\$ 1,490	\$ 68	\$ 1,558	\$ 10.39	
Feb-2016	2	49.20	37.28	1.80	1.31	15.0%	34,970	\$ 1,783	\$ 68	\$ 1,851	\$ 12.34	
Mar-2016	3	41.25	29.25	1.89	1.31	15.0%	54,111	\$ 2,333	\$ 68	\$ 2,401	\$ 16.01	
Apr-2016	4	35.23	23.15	1.99	1.31	15.0%	60,997	\$ 2,262	\$ 68	\$ 2,330	\$ 15.53	
May-2016	5	37.03	20.35	2.37	3.36	15.0%	72,183	\$ 2,781	\$ 187	\$ 2,968	\$ 19.79	
Jun-2016	6	40.55	20.00	2.18	3.36	15.0%	70,273	\$ 2,966	\$ 187	\$ 3,154	\$ 21.02	
Jul-2016	7	49.64	23.95	1.91	3.36	15.0%	71,329	\$ 3,601	\$ 187	\$ 3,789	\$ 25.26	
Aug-2016	8	45.34	21.30	1.71	3.36	15.0%	65,619	\$ 3,065	\$ 187	\$ 3,252	\$ 21.68	
Sep-2016	9	37.40	19.38	2.01	3.36	15.0%	49,462	\$ 1,927	\$ 187	\$ 2,114	\$ 14.09	
Oct-2016	10	36.60	19.75	2.25	3.36	15.0%	40,147	\$ 1,558	\$ 187	\$ 1,746	\$ 11.64	
Nov-2016	11	37.60	23.75	2.28	1.43	15.0%	23,259	\$ 923	\$ 74	\$ 997	\$ 6.65	
Dec-2016	12	38.50	27.25	1.94	1.43	15.0%	21,779	\$ 877	\$ 74	\$ 951	\$ 6.34	
							591,908			\$ 27,110	\$ 180.74	Total
value/MWh				\$ 43.20	Efficiency	14%				\$ 15.06	Avg	

Figure 2

For the reconciliation process, a similar calculation will be performed to determine the exact value of the solar generation. If actual hourly interval metered data is available, then the actual hourly solar generation would be valued at the hourly NYISO RT prices for the closest PTID to the Fruit Belt area. If hourly data is not available, or until hourly

data is available, the total monthly solar generation can be applied to the same profile used in the forecast.

Monthly Bill Credit

Figure 3 shows how the 12-month forecast solar generation value plus prior reconciliations will be used to calculate the monthly bill credit for August 2016. In this example, forecast generation is excluded during the installation and start-up processes. Any actual generation and market value can be “banked” and trued-up with customers going forward, once the bill credit has started. This process will avoid starting out with a small credit and discouraging the customers on the overall benefit of the Demonstration. Delaying some credits until all, or most, installations are complete would be beneficial.

Figure 3 example represents the August bill credit calculation performed at the end of July. The shaded blue area is the 12-month forecast value for August 2016 through July 2017; the green shade represents the true-ups; and the cumulative reconciliation is the difference from the actual value less the forecast value (for the past 12 months), which equals \$495 through July 2016. Thus:

$$\frac{\text{total forecast value} + \text{total reconciliation}}{12 \text{ months} * 150 \text{ customers}} = \text{forecast bill credit for August of } \$15.51.$$

The reconciliation for the past 12 months is necessary since each month only $\frac{1}{12}$ of the total reconciliations are included in the upcoming monthly bill credit. Mathematically, the reconciliations are being spread out over a 12-month period.

Fruit Belt Solar Credit Calculator - Monthly Bill Credit						
Month	Solar Generation Value		Monthly Reconciliation	12 month cumul Reconciliation on 2month lag	Total 12 month Value divided 12	Monthly Bill Credit
	Forecast \$	Actual \$				
Jan-2016						
Feb-2016						
Mar-2016	\$ -	\$ 197	\$ 197			
Apr-2016	\$ -	\$ 771	\$ 771			
May-2016	\$ 2,671	\$ 2,465	\$ (206)	\$ 197	\$ 2,292	\$ 15.28
Jun-2016	\$ 3,154	\$ 2,888	\$ (266)	\$ 968	\$ 2,378	\$ 15.85
Jul-2016	\$ 3,789			\$ 761	\$ 2,353	\$ 15.69
Aug-2016	\$ 3,252			\$ 495	\$ 2,327	\$ 15.51
Sep-2016	\$ 2,114					
Oct-2016	\$ 1,746					
Nov-2016	\$ 997					
Dec-2016	\$ 951					
Jan-2017	\$ 1,699					
Feb-2017	\$ 1,964					
Mar-2017	\$ 2,616					
Apr-2017	\$ 2,355					
May-2017	\$ 2,930					
Jun-2017	\$ 3,063					
Jul-2017	\$ 3,745					
Aug-2017	\$ 3,275					
Sep-2017	\$ 2,016					
Oct-2017	\$ 1,675					
Nov-2017	\$ 968					
Dec-2017	\$ 947					

Figure 3

Energy Supply Reconciliation Mechanism

In the Figure 3 example, the actual supply cost reconciliation(*supply cost – supply revenue*) of August 2016 will be performed in September 2016. As a result, the actual value of the solar generation will be known as well as its impacts in reducing the cost of the NYISO energy purchases. In the reconciliation process, the lower supply cost is offset by the lower revenue associated with the bill credit. If all 150 bills were sent out, then the estimated reduced revenue associated with the Demonstration credit would be \$2,896.

For example, if the actual value of the solar generation reduced supply costs by \$3000, then the reconciliation would be \$2896 less \$3000, or a \$104 credit. This credit would flow through the ESRM to all commodity customers. Thus, all commodity customers would get a direct monthly impact from the true-up of the solar generation. Because the

Demonstration includes the actual prior reconciliations in our forecast for the next 12 months, the 150 participating customers will eventually see the true value of the solar generation in their bill credit. Over the long run, no National Grid commodity customers will see any impact from this bill credit and true-up process.

Generation Metering

The Company will install generation metering at each applicable home's solar PV unit. Each solar array will be metered by a separate automatic meter reading ("AMR") kWh meter. The meters will each be set to separate 'dummy' premises/service points in the Company's billing system ("CSS") to establish the location for sending orders to the field for maintenance, repairs, etc. The meter data will be downloaded monthly to the Company's Field Collection System ("FCS"). FCS will send all the data to CSS monthly in order to post to individual accounts and retain the reading history. FCS will generate a monthly report of the 100 generation meters and register reads to send to the billing system as well as the NY Electric Supply group, who will calculate the credit amount as described in Section 3 above.

Monthly Credit on Customer Bills

The billing system will disburse the credits equally on Tiers I and II participants' bills. The credits will be posted using a regular, automated billing system debit/credit transfer process. Once posted, the credit will appear on the bill in the "Other Charges/Adjustments" section. The credit will be absorbed into the accounts receivable balance. When payments are posted to the account, a payment processing order will be issued. The order will first apply the payment towards oldest amount owing before applying to the 2nd oldest amount owing, etc. according to standard procedure.

Snapshots of sample bills are provided below to illustrate how the solar credit line item will appear on the customers' bills. Sample Bill 1 would apply to a customer not in arrears. Sample Bill 2 would apply to a customer with an arrears balance. The credit would display as "Fruit Belt Solar Demonstration Credit" or an appropriate abbreviation if there is a space limitation on the bill.

Sample Bill 1 – For a customer that is not in arrears

Page 1 of the bill shows the total for “Other Charges/Adjustments,” which will include the solar bill credit (circled in red):

nationalgrid		SERVICE FOR	BILLING PERIOD	PAGE 1 of 3	
		JOHN E DOE	Aug 6, 2015 to Sep 8, 2015		
		23 ANYWHERE ST	ACCOUNT NUMBER	PLEASE PAY BY	AMOUNT DUE
		BUFFALO NY 14213	12345-67890	Oct 7, 2015	\$114.18
www.nationalgridus.com					
CUSTOMER SERVICE 1-800-842-4272					
AUTOMATED SERVICES 1-888-932-0301					
GAS EMERGENCIES 1-800-892-2345					
(Does not replace 911 emergency medical service)					
OUTAGE AND ELECTRIC EMERGENCIES 1-800-867-5222					
300 Erie Blvd West Syracuse, NY 13202					
DATE BILL ISSUED Sep 11, 2015					
			ACCOUNT BALANCE		
			Previous Balance		268.31
			Payment Received on AUG 17 (Check)		- 268.31
			Balance Forward		0.00
			Current Charges		+ 114.18
			Amount Due		\$114.18
To avoid late payment charges of 1.5%, \$ 114.18 must be received by Oct 7 2015.					
SUMMARY OF CURRENT CHARGES					
		DELIVERY SERVICES	SUPPLY SERVICES	OTHER CHARGES/ADJUSTMENTS	TOTAL
		Electric Service	68.87	55.59	124.46
→		Other Charges/Adjustments		-10.28	-10.28
		Total Current Charges	\$68.87	\$55.59	\$114.18

Page 3 of the bill contains the detailed lined item:

→	Other Charges/Adjustments	
	Fruit Belt Solar Demonstration Credit	-10.28
	Total Other Charges/Adjustments	-\$10.28

Sample Bill 2 – For a customer carrying an arrears balance

Page 1 of the bill shows the total for “Other Charges/Adjustments,” which will include the solar bill credit (circled in red):

nationalgrid		SERVICE FOR		BILLING PERIOD	PAGE 1 of 3	
		JOHN E DOE		Aug 8, 2015 to Sep 8, 2015		
		23 ANYWHERE ST		ACCOUNT NUMBER	PLEASE PAY BY	AMOUNT DUE
		BUFFALO NY 14213		12345-67890	Oct 7, 2015	\$382.49
www.nationalgridus.com						
CUSTOMER SERVICE						
1-800-642-4272						
AUTOMATED SERVICES						
1-888-932-0301						
GAS EMERGENCIES						
1-800-892-2345						
(Does not replace 911 emergency medical service)						
OUTAGE AND ELECTRIC EMERGENCIES						
1-800-867-5222						
300 Erie Blvd West						
Syracuse, NY 13202						
DATE BILL ISSUED						
Sep 11, 2015						
DID YOU FORGET?						
The total amount due includes an unpaid balance from a previous bill. If you have already paid this balance, please disregard this message. Thank you.						
ACCOUNT BALANCE						
Previous Balance 268.31						
Payments Received No payments have been received during this period - 0.00						
Balance Forward 268.31						
Current Charges + 114.18						
Amount Due \$382.49						
To avoid late payment charges of 1.5%, \$ 382.49 must be received by Oct 7 2015.						
SUMMARY OF CURRENT CHARGES						
	DELIVERY SERVICES	SUPPLY SERVICES	OTHER CHARGES/ADJUSTMENTS	TOTAL		
Electric Service	68.87	55.59		124.46		
Other Charges/Adjustments			-10.28	-10.28		
Total Current Charges	\$68.87	\$55.59	-\$10.28	\$114.18		

Page 3 of the bill contains the detailed lined item:

Other Charges/Adjustments	
Fruit Belt Solar Demonstration Credit	-10.28
Total Other Charges/Adjustments	-\$10.28

Customer/Stakeholder Engagement and Communications

Customer/stakeholder engagement and communications will be a three-phased approach that includes awareness, enrollment, and installation. National Grid will employ a comprehensive and collaborative mix of traditional grassroots engagement, marketing, public relations, and media relations. National Grid will work with the BNMC team to introduce the Demonstration as a National Grid Pilot Demonstration (“PD”) to the neighboring community. The primary goal of the outreach is to increase awareness and educate customers of near and long-term benefits to stimulate participation.

Why Grassroots, Why the BNMC as Partner

Based on the target neighborhood and potential audience for the Demonstration, National Grid believes that a strong grassroots communications program is essential to gaining community support and participation. While standard marketing and public relations tactics will be employed where appropriate, a street-level, face-to-face communications strategy will be the primary focus, especially early on as the program and its intended benefits are communicated to the neighborhood and other key stakeholders.

The BNMC is a self-sustaining social enterprise successfully combining innovation, job creation, and urban revitalization. It serves as the umbrella organization of the anchor institutions that make up the BNMC located within the 120-acre campus bordering Allentown, the Fruit Belt, and Downtown. The BNMC fosters conversation and collaboration among its member institutions, its partners, and the community to address critical issues impacting them including entrepreneurship, energy, access and transportation, workforce and procurement, neighborhoods, and healthy communities with the goal of increasing economic development and building a strong community.

As such, the BNMC team is uniquely qualified to partner with National Grid on the Demonstration project in the Fruit Belt, adjacent to the medical campus. The NG/BNMC partnership will facilitate conversation with Fruit Belt residents, organizations, and leadership to raise awareness and participation in the project. It is expected that the project will be received favorably by local residents, however, based on previous BNMC experience and understanding of neighborhood issues, it is critical to engage residents in a thoughtful, targeted approach to build credibility and support for the project.

For these reasons, a neighborhood engagement approach, including personal outreach to neighborhood leaders, open forums where residents can ask questions, and working through organizations and individuals trusted by Fruit Belt residents, can lead to greater interest and acceptance of the Demonstration.

Examples of past successful Fruit Belt neighborhood engagement led by the BNMC are detailed in Appendix 1. Letters of support from stakeholders are provided in Appendix 2.

Stakeholder/Customer Engagement & Communications to Date

Program Conception (Fall 2014 – Spring 2015): COMPLETE

Audience: Fruit Belt Leaders, Potential Partners and influencers

Key Messages: Preliminary planning; request for input and support

- a. Conducted preliminary meetings with multiple Fruit Belt neighborhood leadership groups including:
 - i. Orchard Community Initiative
 - ii. Fruit Belt Advisory Council
 - iii. Buffalo Federation of Neighborhood Centers
 - iv. Fruit Belt Coalition
 - v. Fruit Belt Homeowners and Tenant Council
- b. Secured letters of support from key leaders including Orchard Community Initiative and the Fruit Belt Advisory Council.
- c. Communicated with key legislative contacts to apprise them of the project and seek input and support including Common Council President Darius Pridgen, Buffalo Common Council President, State Assemblywoman Crystal-Peoples-Stokes, and State Senator Tim Kennedy.

Conditional Program Approval (Spring/Summer 2015): COMPLETE

Audience: Overall Community

Key Messages: The Commission has granted preliminary approval to the Demonstration; project details may change pending final approval

- a. National Grid issued a press release regarding project approval; in-depth media coverage in Buffalo News.
- b. Hosted a BNMC Four Neighborhoods-One Community Meeting on July 15, 2015 highlighting the project and featuring Dennis Elsenbeck from National Grid to outline the project and answer questions from the local community. Four Neighborhoods One Community meetings are held quarterly on the Medical Campus and are designed to share information and gather input from local residents on issues of concern including transportation, parking, workforce development, local procurement, entrepreneurship and healthy communities.



- c. Developed and posted an Executive Summary and Frequently Asked Questions regarding the project on a “community bulletin board” on the BNMC website, designed to provide up to date information regarding the project for interested stakeholders.
- d. National Grid conducted discussions with City legislative leaders regarding the project.

Stakeholder/Customer Engagement & Communications Remaining

Phase 1: “Awareness”

Phase 1 of the Demonstration communications will be a comprehensive and collaborative mix of traditional grassroots engagement, marketing, public relations, and media relations. National Grid will work with the BNMC to introduce the Fruit Belt Neighborhood Solar Demonstration. The primary goals of Phase 1 are to increase awareness and educate customers of near and long-term benefits to stimulate participation.

Audience	Details	Key Message	Communication Tactic/Channel/Owner(s)
Customers	<ul style="list-style-type: none"> Current Fruit Belt Residents Owners/Renters 	<ul style="list-style-type: none"> Unique, stand-alone opportunity Way to generate \$ savings on your bill AT NO COST TO YOU Community Benefits – Shared Savings Participation is optional Not all will be eligible/Why Join us at these events to learn more Visit us at these sites to learn more Call us at this # to learn more Brought to you by National Grid in partnership with BNMC and the State of NY in support of the Governor’s REV Initiative 	<ul style="list-style-type: none"> 4 Neighborhood 1 Community meetings (BNMC/National Grid) Community Advocacy Meetings (National Grid/BNMC) “At the Table” lunches (BNMC/National Grid) “We know TM” One Page print mailer (BNMC) Project Description One Pager/Leave Behind (National Grid) Partner Communications (UB, Roswell) Community Weeklies-Newsletters (Community Org TBD) Dedicated Project Website (National Grid) Community Websites (BNMC) e-newsletter (BNMC) Paid Social Media targeted to Community Facebook Pages (National Grid) Community Weeklies-Newsletters (Community Org TBD) Targeted Mobile Advertising (National Grid) Public Transportation Advertising (National Grid/BNMC) Informative Demonstration Video leveraged via mobile, social, events (National Grid) Toll Free/716 Phone #



Neighborhood Orgs & Leaders	<ul style="list-style-type: none"> • Buffalo Federation of Neighborhood Communities (BFNC) • Orchard Community Initiative (OCI) • Fruit Belt Homeowners/Tenants Assoc. • Fruit Belt Advisory Council • Block Clubs (Fruit Belt United, Mulberry Street, Fruit Belt Coalition) • Faith-based Organizations • Allentown Association/Non-Fruit Belt neighbors • McCarly Garden Task Force 	<ul style="list-style-type: none"> • The Demonstration is a worthwhile program for those Fruit Belt residents who elect to participate, and to overall community • Partner with us to help communicate program • Test program for underserved neighborhoods • NO COST OPPORTUNITY • Opportunities range from home energy assessments, bill credits, solar installations • Educational opportunity for additional cost savings measures for those who may not meet eligibility requirements • Brought to you by National Grid in partnership with BNMC and the State of NY in support of the Governor's REV Initiative 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Community Websites (BNMC) • Dedicated Project Website (National Grid) • Community Advocacy Meetings (National Grid/BNMC) • Project Description One Pager/Leave Behind (National Grid) • Informative Demonstration Video (National Grid)
Neighborhood Gov't Reps	<ul style="list-style-type: none"> • NYS Assemblyperson • Crystal Peoples Stokes • Common Council President • Darius Pridgen • NYS Senator • Tim Kennedy • Erie County Legislator • Barbara Miller Williams • City of Buffalo 	<ul style="list-style-type: none"> • The Demonstration is a worthwhile program for those Fruit Belt residents who elect to participate, and to overall community • Partner with us to help communicate program • Test program for underserved neighborhoods • Opportunities range from home energy efficiency services, bill credits, solar installations • Educational opportunity for additional cost savings measures for those who may not meet eligibility requirements • Brought to you by National Grid in partnership with BNMC and the State of NY in support of the Governor's REV Initiative 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Community Websites (BNMC) • Dedicated Project Website (National Grid) • Community Advocacy Meetings (National Grid/BNMC) • Project Description One Pager/Leave Behind (National Grid) • Informative Demonstration Video (National Grid)



Government Reps:	<ul style="list-style-type: none"> • Mayor • Common Council • County • State • Federal 	<ul style="list-style-type: none"> • The Demonstration is a worthwhile program for those Fruit Belt residents who elect to participate • Partner with us to help communicate program • Brought to you by National Grid in partnership with BNMC and the State of NY in support of the Governor's REV Initiative 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Community Websites (BNMC) • Dedicated Project Website (National Grid) • Community Advocacy Meetings (National Grid/BNMC) • Project Description One Pager/Leave Behind (National Grid) • Informative Demonstration Video (National Grid)
Media	<ul style="list-style-type: none"> • Neighborhood/ethnic media • (Criterion. Challenger, Black WNY) • Local/Regional • Trade Press • Social media 	<ul style="list-style-type: none"> • Unique Demonstration project that will benefit residents and test potential new solar distribution model in underserved neighborhoods • Partner with us to help communicate program • Test program for underserved neighborhoods • Opportunities range from home energy efficiency services, bill credits, solar installations • Educational opportunity for additional cost savings measures for those who may not meet eligibility requirements • Brought to you by National Grid in partnership with BNMC and the State of NY in support of the Governor's REV Initiative 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Community Websites (BNMC) • Dedicated Project Website (National Grid) • Community Advocacy Meetings (National Grid/BNMC) • Project Description One Pager/Leave Behind (National Grid) • Informative Demonstration Video (National Grid)
Partners	<ul style="list-style-type: none"> • GE • Solar Liberty 	<ul style="list-style-type: none"> • GE/Solar Liberty/NYSERDA in partnership with the State of NY/ National Grid/BNMC proud to leverage our expertise/technology for the advancement of community based renewables in the underserved Fruit Belt community. 	<ul style="list-style-type: none"> • Partner preferred tactics/channels TBD



Employees	<ul style="list-style-type: none"> • BNMC • National Grid 	<ul style="list-style-type: none"> • Be proud of this unique partnership b/w National Grid/BNMC & State of NY in support of the Governor's REV Initiative • Part of an innovative approach to raising solar adoption rates while assisting a traditionally underserved community 	<ul style="list-style-type: none"> • Internal Communications Channels for each organization
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Stakeholder/Customer Engagement – Phase 2 “Enrollment”

Building off momentum from Phase 1, Phase 2 presents a mix of more targeted education/awareness messaging (until the Demonstration thresholds are met) with a new customer focus on driving enrollment. Using similar tactics as Phase 1, National Grid with the continued support of BNMC, partners, and engaged community stakeholders will deliver, in clear, easy to understand language, the process for enrollment and participation in the Demonstration. The primary audience will be customers with ongoing secondary communications to all other stakeholders to identify milestones and share in additional opportunities to support each other.



Audience	Details	Key Message	Communication Tactic/Channel/Owner(s)
Customers	<ul style="list-style-type: none"> Current Fruit Belt Residents Owners/Renters 	<ul style="list-style-type: none"> Describe 3 Tiers of Eligibility To determine Tier eligibility, call this # <p>After assessment</p> <ul style="list-style-type: none"> If eligible you will: <ul style="list-style-type: none"> Estimated timeline detailing process start to finish If NOT you can: <ul style="list-style-type: none"> Alternative National Grid or Buffalo Programs to further assist those interested in making changes but not eligible. 	<ul style="list-style-type: none"> Community Advocate Meetings (National Grid/BNMC) Tabling/Enrollment Drives at Fruit Belt Community Events during defined enrollment period (National Grid/BNMC) “At the Table” lunches (BNMC/National Grid) “We know TM” One Page print mailer (BNMC) Project Enrollment Kit Digital/Print (National Grid) Dedicated Project Website Updates (National Grid) Community Websites (BNMC) e-newsletter (BNMC) Dedicate toll free/716 Area Code Info/Enrollment Line
Neighborhood Orgs & Leaders	<ul style="list-style-type: none"> Buffalo Federation of Neighborhood Communities (BFNC) Orchard Community Initiative (OCI) Fruit Belt Homeowners/Tenants Assoc. Fruit Belt Advisory Council Block Clubs (Fruit Belt United, Mulberry Street, Fruit Belt Coalition) Faith-based Organizations Allentown Association/Non-Fruit Belt neighbors McCarly Garden Task Force 	<ul style="list-style-type: none"> Describe 3 Tiers of Eligibility To determine Tier eligibility, call this # <p>After assessment</p> <ul style="list-style-type: none"> If eligible you will: <ul style="list-style-type: none"> Estimated timeline detailing process start to finish If NOT you can: <ul style="list-style-type: none"> Alternative National Grid or Buffalo Programs to further assist those interested in making changes but not eligible. 	<ul style="list-style-type: none"> Community Advocate Meetings (National Grid/BNMC) Tabling/Enrollment Drives at Fruit Belt Community Events during defined enrollment period (National Grid/BNMC) “At the Table” lunches (BNMC/National Grid) “We know TM” One Page print mailer (BNMC) Project Enrollment Kit Digital/Print (National Grid) Dedicated Project Website Updates (National Grid) Community Websites (BNMC) e-newsletter (BNMC) Dedicate toll free/716 Area Code Info/Enrollment Line



Neighborhood Gov't Reps	<ul style="list-style-type: none"> • NYS Assemblyperson • Crystal Peoples Stokes • Common Council President • Darius Pridgen • NYS Senator • Tim Kennedy • Erie County Legislator • Barbara Miller Williams • City of Buffalo 	<ul style="list-style-type: none"> • Describe 3 Tiers of Eligibility • To determine Tier eligibility, call this # After assessment • If eligible you will: <ul style="list-style-type: none"> ◦ Estimated timeline detailing process start to finish • If NOT you can: <ul style="list-style-type: none"> ◦ Alternative National Grid or Buffalo Programs to further assist those interested in making changes but cannot participate • NS is a worthwhile program for those Fruit Belt residents who elect to participate, and to overall community 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Community Websites (BNMC) • Dedicated Project Website (National Grid) • Community Advocacy Meetings (National Grid/BNMC) • Project Description One Pager/Leave Behind (National Grid) • Informative Demonstration Video (National Grid)
Government Reps	<ul style="list-style-type: none"> • Mayor • Common Council • County • State • Federal 	<ul style="list-style-type: none"> • Demonstration updates 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Direct Email Fruit Belt Solar Newsletter
Media	<ul style="list-style-type: none"> • Neighborhood/ethnic media (Criterion, Challenger, Black WNY) • Local/Regional • Trade Press • Social media 	<ul style="list-style-type: none"> • Describe 3 Tiers of Eligibility • Estimated Monthly Cost Savings • Estimated Annualized Aggregate Savings • Estimated EE Metrics • The Demonstration is a worthwhile program for those Fruit Belt residents who elect to participate, and to overall community • Brought to you by National Grid in partnership with BNMC and the State of NY in support of the Governor's REV Initiative 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Community Websites (BNMC) • Dedicated Project Website (National Grid) • Community Advocacy Meetings (National Grid/BNMC) • Project Description One Pager/Leave Behind (National Grid) • Informative Demonstration Video (National Grid)



Stakeholder/ Customer Engagement – Phase 3 “Installation”

With the Demonstration participation at capacity and all eligible participants defined in all 3 tiers (Home Energy assessment/Bill Rebates/Solar Installations), the primary focus of this stage of engagement and communications is direct between the participants, National Grid, and solar installers with supplemental communication to all other stakeholders marking milestones with planned public relations (PR) events at the first and last installations.

Audience	Details	Key Message	Communication Tactic/Channel/Owner(s)
Customers	<ul style="list-style-type: none"> Demonstration Participants 	<ul style="list-style-type: none"> Installation Prep Installation Date Completion During the process for any issues/concerns or questions please <ul style="list-style-type: none"> Call us at Visit us at Send an email to 	<ul style="list-style-type: none"> Direct 2 way Communications (National Grid/Solar Liberty) Dedicated Project Website (National Grid/Solar Liberty) Toll Free/716 Phone # Dedicated email address
Neighborhood Orgs & Leaders	<ul style="list-style-type: none"> Buffalo Federation of Neighborhood Communities (BFNC) Orchard Community Initiative (OCI) Fruit Belt Homeowners/Tenants Assoc. Fruit Belt Advisory Council Block Clubs (Fruit Belt United, Mulberry Street, Fruit Belt Coalition) Faith-based Organizations Allentown Association/Non-Fruit Belt neighbors McCarly Garden Task Force 	<ul style="list-style-type: none"> Demonstration Updates Milestone Dates PR Events Beginning/End 	<ul style="list-style-type: none"> Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) Dedicated Project Website (National Grid/Solar Liberty) Email/Direct Mail Updates



Neighborhood Gov't Reps	<ul style="list-style-type: none"> • NYS Assemblyperson • Crystal Peoples Stokes • Common Council President • Darius Pridgen • NYS Senator • Tim Kennedy • Erie County Legislator • Barbara Miller Williams • City of Buffalo 	<ul style="list-style-type: none"> • Demonstration Updates • Milestone Dates • PR Events Beginning/End 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Dedicated Project Website (National Grid/Solar Liberty) • Email/Direct Mail Updates
Government Reps	<ul style="list-style-type: none"> • Mayor • Common Council • County • State • Federal 	<ul style="list-style-type: none"> • Demonstration Updates • Milestone Dates • PR Events Beginning/End 	<ul style="list-style-type: none"> • Personal Outreach- Face to Face group and/or individual meetings (National Grid/BNMC) • Dedicated Project Website (NG/Solar Liberty) • Email/Direct Mail Updates
Media	<ul style="list-style-type: none"> • Neighborhood/ethnic media • (Criterion. Challenger, Black WNY) • Local/Regional • Trade Press • Social media 	<ul style="list-style-type: none"> • Demonstration Updates • Milestone Dates • PR Events Beginning/End 	<ul style="list-style-type: none"> • Press Release/Media Alert Updates (National Grid/BNMC) • Press Event (National Grid/BNMC/Solar Liberty/GE)

Alignment with New York State Energy Initiatives

In addition to the goals of the REV Proceeding, the Demonstration aligns with the guiding principles of the State's major energy initiatives:

The Energy to Lead: 2015 New York State Energy Plan Vol. 1

The Demonstration's scope addresses five key elements of the 2015 New York State Energy Plan that help to establish it as a replicable, scalable model to drive implementation:

- Energy Affordability
- The transition to a "clean energy economy"
- Reliability and Resiliency
- Regulatory Reform, and
- Environmental Justice

As referenced earlier, this initiative will feature a utility ownership model, which will demonstrate the possibilities and flexibility of an alternative business model. Ultimately, this type of innovation creates an avenue for more customers to engage, especially in a LMI urban area, to the benefit of the entire National Grid electric system and its customers.

The Green Jobs – Green New York ("GJGNY") Act of 2009

This proposal supports the workforce development vision of the Green Jobs - Green New York Program ("GJGNY") to lessen the burden of energy costs on consumers while spurring local job growth in the clean energy sector.

In particular, the project would support GJGNY's critical objective of "target[ing] communities in areas where energy costs are particularly high in relation to a measure of median household income" by creating permanent jobs through the involvement of Solar Liberty, a Buffalo-based partner that has committed to hiring five local residents to support the installation and ongoing work resulting from the Demonstration. Additionally, the potential involvement of other local partners will further support the workforce development.

The New York State Regional Economic Development Councils' ("REDCs") Cleaner, Greener Communities ("CGC") Program

The primary goal of the CGC Program is to encourage communities to foster public-private partnerships along with regional sustainable growth strategies in order to promote energy efficiency and renewables integration. The Demonstration seeks to

support this goal by engaging the residents in the Demonstration area to contribute towards, and benefit from, New York State's clean energy economy.

Proceeding on Motion of the Commission to Consider a Clean Energy Fund ("CEF")

In its response to the New York State Public Service Commission's Order to consider the establishment of a Clean Energy Fund ("CEF"), NYSERDA's proposal identifies several key economic, supply-side, and community barriers that each customer segment faces in the State's drive "to advance cleaner, more resilient, and affordable energy infrastructure for New York State."⁷

The Demonstration holistically addresses three specific LMI residential barriers referenced in the CEF Proposal:

1. "LMI residents are financially stressed, and lack the capital or willingness to take on debt to cover energy efficiency and distributed generation investments, despite the attractive economic value of these investments."
2. "Employment is inhibited by unpredictable volume of local work or availability of incentives to stimulate volume."
3. "EE and DG/RE services providers often avoid disadvantaged communities based on the expectation that return on their marketing investment will be low."⁸

The Demonstration addresses the lack of capital barrier by offering a solution at zero cost to the participating customer that includes opportunities in both energy efficiency and solar PV. This enables participation in new clean technology market for those currently excluded due to recognized market barriers. By working closely with local third parties, additional market stimulation allows for job creation at a local level. Through the proposed revenue-neutral, utility ownership model, various LMI community barriers are effectively addressed to allow for the community's greater participation in, and greater benefit from, the State's clean energy economy.

The Western New York Regional Sustainability Plan

The Demonstration drives the vision statement of the Western New York Sustainability Plan "to create a future where social and environmental issues are addressed within a framework of a sustainable regional economy. The pursuit of sustainability includes the creation and maintenance of conditions under which our communities utilize the

⁷ New York State Energy Research and Development Authority, Clean Energy Fund Proposal filed 9/23/2014, p. 5.

⁸ New York State Energy Research and Development Authority, Clean Energy Fund Proposal filed 9/23/2014, pp. 65-66.

resources we have in the most effective ways in order to permit social and economic growth while preserving natural resources.”⁹ As a tangible, representative project that encompasses many of the implementation goals and strategies outlined in the Sustainability Plan, the Demonstration promotes the use and development of renewable energy through integrating public education.

Grid Efficiency Benefits

The residential PV systems used in the Demonstration are based on solar panels with integral micro-inverters. Many solar installations employ a single inverter for all panels in the array. In such cases, the panels are in a series, connected in strings. There may be multiple strings connected in parallel depending on the power rating and voltage delivered to the single inverter. Since solar panels are DC devices, special care must be taken in the routing and protection of the DC wiring. Hence, certified solar installers are required for arrays interconnected with DC voltage. Once connected to the inverter, which is normally located remotely from the solar panels, the DC energy is converted to AC before interconnecting to household wiring. Typically, if a shadow is cast on one panel in a string, power from that whole string is interrupted. Utilizing solar panels with individual inverters (one per panel) creates performance benefits for small residential arrays. Unlike single inverter systems, when a shadow is cast on one solar panel, only that panel will experience power reduction. Additionally, because the micro-inverters convert the DC power to AC at the panel itself, AC power flows through roof and home wiring, avoiding any special interconnection provisions required beyond normal, standard practice. The power produced by the individual solar panels in the solar PV system will be aggregated and interconnected to the customer at the service entrance. The micro-inverters selected for the Demonstration can generate reactive power at any time when the panels are not producing real power at their maximum output (*i.e.*, in the morning and evening, on cloudy days, and at night). This capability will be used in the Demonstration to improve the power factor at the home as well as on the distribution circuit. This will result in improved upstream electric power system efficiencies. There will be multiple power factor control methods employed to test the effectiveness of each, with the goal of evaluating the efficiency benefits gained in relation to projected costs.

Meters and control systems will be utilized both at homes as well as the substation in order to provide monitoring and feedback for verification and control. These will include:

- Existing house consumption meter – This is a standard single-phase 120/240V revenue meter (not a net energy meter). For the Demonstration sites, a smart

⁹ Western New York Regional Sustainability Plan 2013, Executive Summary,
<http://regionalcouncils.ny.gov/sites/default/files/regions/westernny/Western-NY-CGC-Plan-Report.pdf>

meter will be installed at the same time as the interface/interconnect device to provide more granular interval data and some operational data (*i.e.*, volts, current, and power factor). However, for concept roll-out, the existing automatic meter reading (“AMR”) drive-by meters that are installed at the premises now will be sufficient.

- Solar generation meter – This meter measures the solar generation independently of the premises’ consumption. It will be part of the interconnection at the customer’s premises, and will be installed at the same time as the solar panels.
- Power factor meter – This meter will measure the phase angle of the home/solar combination at the premises’ service entrance, *i.e.*, it will be located on the utility-side of both the existing consumption meter as well as the solar generation meter. It will be part of the interconnection at the premises, and installed at the same time as the solar panels. Since it will be housed within the interconnecting device, this meter requires some development by the interconnecting device manufacturer.
- Substation meter – These meters will be located at the head-end of each feeder (likely three in total). They will be high-performance meters that measure many power system parameters with great accuracy. They will either be located within, or on the individual circuits just outside of, the substation. These meters will be installed early in the Demonstration to provide baseline circuit data.
- Home gateway – A gateway will be located at each home with a solar array. The purpose of the gateway will be to communicate with all micro-inverters at that location in order to provide dispatch control signals, monitoring, and diagnostics.
- Centralized control system – A system to control and dispatch reactive power from all of the micro-inverters simultaneously can be located at either the substation or an alternate location. It will make use of feedback from the meters to calculate and send dispatch signals to the gateways.

Various use cases will be tested as described in the Test Scenarios section of this plan. A two-way wireless communication system will be utilized for data transmission between the gateways, field metering, and control and monitoring locations. This communication system is presently planned as a 4G cellular wireless system. A separate wireless system will exist between the home gateway and the individual micro-inverters and will be part of the home solar system. Through the collection and processing of both real-time solar PV system data and central control system circuit data, reactive power dispatch signals will be calculated and sent to the gateways and, in-turn, to the micro-inverters for the non-autonomous use cases. The reactive power output from the micro-inverters will be adjusted to minimize the amount supplied by the electric grid, which will optimize circuit efficiency. Circuit voltage will be monitored during the use cases to assure it stays within required parameters.

For the Demonstration, the adjustment of reactive power, and thus the effect on circuit efficiency, will be limited to the capabilities of the number of solar PV systems installed on the individual distribution circuits. The use case results will be compared to the base case results in order to determine the effect that the solar PV systems have on distribution circuits and upstream efficiencies.

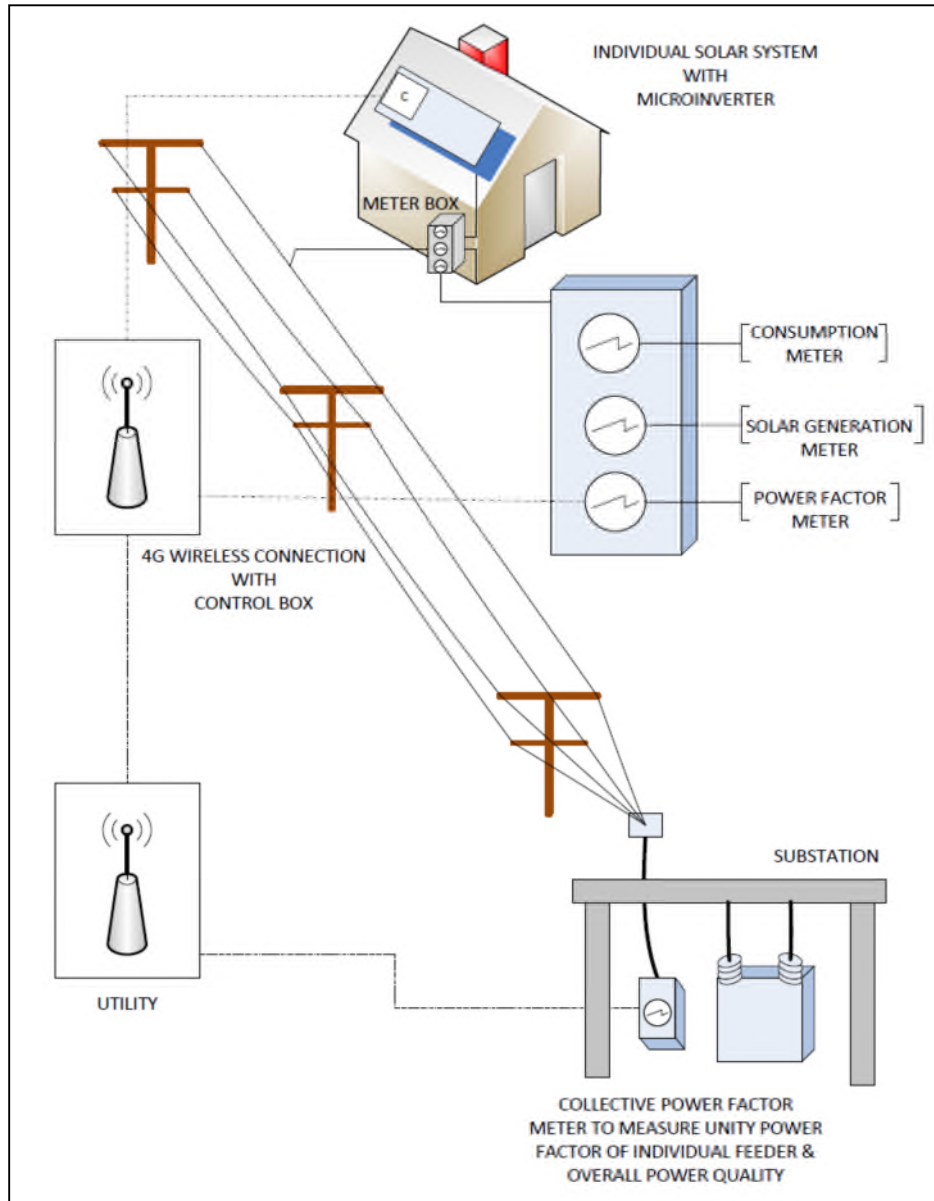


Figure 4: Illustration of Equipment and Set-Up to Measure Grid Efficiency

Test Statements

In addition to delivering the expected primary customer benefit of energy bill savings, the Demonstration allows the opportunity to test additional benefits that fall into two categories: (1) customer bill payment behavior and arrears management, and (2) grid efficiency benefits.

Test Statement	If...	Then...
Providing solar and energy efficiency to customers will lower their electric bills by a meaningful amount.	The value of solar generation of 100 units (estimated at 5 kW each) is divided equally among 150 participants as a bill credit, and participants are offered additional ways to save energy through efficiency.	The expected bill reduction will be at least \$15 per month or about 15-20% of their monthly electric charges.
Providing solar credits to participants in a LMI neighborhood, as well as offering energy efficiency to further drive bill savings through reduced energy consumption, will have a positive impact on bill payment behavior and enable better management of arrears.	LMI participants' electric bills are reduced due to solar bill credits and energy efficiency measures.	Participants will be able to pay 3-5% more of their total balance (current charges + arrears) than the control group.
		Participants will pay down 5% more of their arrears balance compared to the control group.
Concentrating distributed, solar resources with VAR support within a boundary served by a common substation vs. scattered deployment of conventional rooftop solar will deliver measurable grid efficiency benefits.	Volt/VAR optimization is enabled on a per system basis.	The power factor of customers' electric service will improve, reducing local losses.
	Power is generated along the feeder and Volt/VAR optimization is enabled on a substation basis.	Substation power factor will improve, reducing system losses.
		Circuit and substation losses will be reduced based on the number of solar PV systems installed on the homes on each circuit.

Note: Before specific per-circuit targets can be developed for grid efficiency benefits, the following will need to be determined:

1. How many solar PV systems are installed on each circuit;
2. Existing operating conditions; and
3. The results from network modeling of the circuits.

Preliminary estimates from rough modeling of the aggregated solar PV system output on a typical 4160V circuit show that the combined grid efficiency benefits from the real and reactive power generated may be on the order of 15,000 kWh per year. More detailed modeling and estimates will be developed early in the Demonstration.

Test Population

To test the hypotheses related to customer bill payment behavior and arrears management, participants in Tiers I and II (those receiving the solar bill credit) will be compared to a control group. The control group will represent similar account attributes to that of the participant group including risk score and accounts receivable aging. The risk score is calculated by Experian, which applies its proprietary algorithm to the customer's National Grid payment history exclusively, including 12 months of bill payment history as well as related factors, such as terminations for non-payment. The risk score is distinct from a credit score and utilizes National Grid data exclusively. The customer's identity will be safeguarding and an individual risk score will not be revealed to other parties. As for the accounts receivable aging profile, a similar breakdown of customers not in arrears and those in arrears will be selected based on the profile of those that participate in the Demonstration. For example, if 25% of the customers who participate in the Demonstration do not have any arrears, then the control group will include 25% that are not in arrears.

Test Scenarios

Customer Bill Reductions

The Demonstration will utilize individual customers' monthly energy consumption to conduct usage comparisons in order to measure total electric bill savings resulting from energy efficiency, solar bill credits, and increased energy awareness. The bill analysis will be weather-adjusted to account for temperature variability between two comparison periods, such as January 2016 usage compared to January 2015.

Customer Bill Payment Behavior and Arrears Management

Two metrics – Collection Rate and Arrears Change Rate – have been developed to test customer bill payment behavior and arrears management and will compare a participant group with a control group. Each metric will be calculated on an individual account basis, but will be reported on an aggregate basis. Calculating each metric by individual

account in the participant and control groups allows the opportunity to adjust for any outliers, if necessary. The Demonstration will have a “target” to enroll at least 35 customers carrying an arrears balance out of the 150 (or about 23%) in Tiers I and II receiving solar bill credits in order to test these hypotheses.

Both Collection Rate and Arrears Change Rate will be studied quarterly with a cumulative view. For example, the first quarterly report will study the results of these metrics over a 3-month period; the next quarterly report will view the results over a 6-month period, and so forth. It is expected that the results of these metrics will carry more significance over the long-term, while the quarterly frequency allows for understanding the data, including determining the level of “noise” that may exist with shorter frequency.

Collection Rate

“Collection Rate” is a measurement of customer bill payment behavior. Participants in Tiers I and II are expected to pay a higher percentage of their total bill compared to the control group due to the reduction in the total bill as a result of the solar credits.

$$\text{Collection Rate} = \frac{\text{Total Customer Payments } [\$]}{\text{Total Dollars Available to Collect } [\$]}$$

“Total customer payments” will include payments made by the customer during the study period. “Total dollars available to collect” will include the accounts receivable balance at the beginning of the study period plus new billings incurred during study period.

Arrears Change Rate

The “Arrears Change Rate” is a measurement of customers’ management of their arrears balances. Participants in Tiers I and II receiving solar bill credits are expected to have a higher rate of paying down their arrearages compared to the control group.

$$\text{Arrears Change Rate} = \frac{\text{Beginning Period Arrears } [\$] - \text{Ending Period Arrears } [\$]}{\text{Beginning Period Arrears } [\$]}$$

“Beginning period arrears” is the outstanding accounts receivable greater than 30 days at the beginning of the study period. “Ending period arrears” is the outstanding accounts receivable greater than 30 days at the end of the study period.

Grid Efficiency Benefits

Solar PV arrays are intended to produce watts (*i.e.*, real power) which can be used to perform real work and have monetary value on the electric system. Electric loads also require reactive power (*i.e.*, VARS), which performs no work but is needed for other purposes, such as magnetizing motor and transformer cores, and energizing capacitive loads. Both watts and VARS require electrical current flow on the power system. Any flow of electric current creates losses on the system due to the impedance of electric equipment and wires. Any time electrical current can be reduced, losses are reduced. Generating real and reactive power at the load (*i.e.*, the premises rather than delivering it from centralized generation) will effectively reduce losses along the lines. As mentioned previously, the micro-inverters being used for the Demonstration have the capability to generate real power when the sun is shining and the solar PV panels are producing, and reactive power even when the sun is not shining. Since watts and VARS are mathematically orthogonal, they both may be generated simultaneously. However, since the micro-inverter has a finite rating, one trades off for the other, *i.e.*, if we prioritize watts first (“watts priority”) and the micro-inverter is generating at its maximum rating, there is no extra capability to generate VARS; conversely, if reactive power is prioritized (“VARS priority”), the output of real power will be limited. The majority of use cases proposed for the Demonstration will utilize the micro-inverters in a watts priority mode to optimize the output of solar generated real power. Additionally, the real power generated at peak delivery times has a greater impact on the reduction of losses than reactive power generated at off-peak times.

Proposed use cases will include looking at the following architecture options. Each use case will be reviewed during the modeling phase of the Demonstration to assess its potential value.

1. The default option is to set the micro-inverters to watts priority and unity power factor.
 - This would represent a “standard” or typical solar PV installation.
 - For this use case, the gateway (defined previously) would provide micro-inverter monitoring and diagnostics only.
2. The second option is to set the micro-inverters to watts priority, but use the reactive power capability of the inverters to improve the local power factor while maintaining maximum solar generation. This use case would:
 - Improve each customer’s power factor while maximizing the solar generation.
 - Make use of a power factor meter on the line-side of the generation and customer meters at the home to provide feedback to the control system housed in the solar PV system gateway.

- Make use of local communication between the gateway, micro-inverters, and sensing meter.
 - Create the opportunity to assess value to be determined by cycling this optimizing control on and off for set intervals to determine the respective benefits. The interval time length will be determined via input from the circuit modeling phase of the Demonstration.
3. The third option is to set the micro-inverters to watts priority, but use the reactive power capability of the inverters in response to feeder voltage or frequency variations while maintaining maximum solar generation. This use case would:
- Make use of the voltage and frequency sensed by one of the meters at the customer's service entrance to provide feedback to the control system housed in the PV system gateway, or alternatively could be provided as an autonomous function of the micro-inverters, in which case the gateway would be used for monitoring and diagnostics only.
 - Make use of local communication between the gateway, micro-inverters, and sensing meter.
 - Provide reactive power up to 24 hours per day.
4. The fourth option is to set the micro-inverters in a VARS priority mode, to prioritize the reactive power capability of the inverters in response to feeder voltage or frequency variations. This use case would:
- Make use of the voltage and frequency sensed by one of the meters at the customer's service entrance to provide feedback to the control system housed in the PV system gateway, or alternatively could be provided as an autonomous function of the micro-inverters, in which case the gateway would be used for monitoring and diagnostics only.
 - Make use of local communication between the gateway, micro-inverters, and sensing meter.
 - Provide reactive power up to 24 hours per day.
5. The fifth option would be to send commands to the home gateways from a central control located at the substation, or other utility location, to centrally manage reactive power control. The commands should take into account which homes have more reactive power capacity. The gateway itself will have the intelligence to determine which micro-inverters have more reactive power capacity and dispatch them accordingly. This use case would:
- Make use of a control system at the substation or other remote location (through a feeder optimizing algorithm).

- Make use of a substation meter for power factor reference and feedback to the control system.
- Utilize communication between the substation meter and the central control system.
- Utilize communication between the central control system and micro-inverters.
- Provide reactive power up to 24 hours per day.

Checkpoints

Checkpoint	Description
Customer Interest	<ul style="list-style-type: none"> – Measure: Number of participants – How: Managed list by the outreach team – When: Bi-weekly during outreach campaign – Target: Up to 300 participants – Mitigation Strategies: Review messaging and increase outreach efforts
Energy Efficiency Participation	<ul style="list-style-type: none"> – Measure: Number of energy efficiency program sign-ups and/or participants – How: Managed by EE services provider – When: Monthly throughout project – Target: Up to 300 participants – Mitigation Strategies: Recruit additional applicants / increase outreach
Solar Host Qualification	<ul style="list-style-type: none"> – Measure: Number of rooftop engineering assessments resulting in “solar-ready” approval – How: Managed list by Solar Liberty – When: Bi-weekly during enrollment period – Target: 100 participants – Mitigation Strategies: Increase outreach efforts
Avg. Solar Bill Credit	<ul style="list-style-type: none"> – Measure: Avg. solar bill credit – How: National Grid’s billing team to perform analysis – When: Quarterly after solar installs are complete – Target: Avg. bill credit of 15-20% for Solar Participants – Mitigation Strategies: Investigate efficacy of installed systems

Collection Rate	<ul style="list-style-type: none"> – Measure: Total customer payments divided by total dollars to collect – How: Analysis by National Grid Credit & Collections team – When: Quarterly with a cumulative view (period of 3 months, 6 months, 9 months, etc.) – Target: Avg. 3% to 5% increase in collection rate compared to control group – Mitigation Strategies: N/A
Arrears Change Rate	<ul style="list-style-type: none"> – Measure: Beginning period arrears minus from ending period arrears, divided by beginning period arrears – How: Analysis by National Grid Credit & Collections team – When: Quarterly with a cumulative view (period of 3 months, 6 months, 9 months, etc.) – Target: 5% more than the control group – Mitigation Strategies: N/A
Greater electric distribution efficiency	<ul style="list-style-type: none"> – Measure: Distribution grid efficiency – How: Pre-reading vs. post reading of the substation's voltage, reactive power, and distribution line losses – When: Baseline testing pre-installation, interval testing, and post-installation after all 100 sites have been installed – Target: 15,000 kWh per year reduction in line losses; improvement over baseline data to be determined – Mitigation Strategies: N/A
Optimization on a per system basis	<ul style="list-style-type: none"> – Measure: Power factor of each system – How: Pre-reading vs. post reading of each solar host site's voltage and reactive power – When: Baseline testing pre-installation, interval testing, and post-installation after each system has been installed – Target: TBD; improvement of each home's power factor – Mitigation Strategies: N/A

Note: Before specific targets can be developed for grid efficiency benefits, the following will need to be determined:

1. How many solar PV systems are installed on each circuit;
2. Existing operating conditions; and
3. Results from network modeling of the circuits.

Project Structure and Governance

Project Team

National Grid

Utility Skill Sets

- Project Management
- Stakeholder and Customer Engagement
- Billing
- Credit and Collections
- Pricing
- Meter Data Services
- Meter Testing and Engineering
- Network Asset Strategy
- Procurement
- Data Analytics

Partners

Buffalo Niagara Medical Campus (“BNMC”)

BNMC is a self-sustaining social enterprise successfully combining innovation, job creation, and urban revitalization. BNMC serves as the umbrella organization of the anchor institutions that make up the BNMC 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.

BNMC Skill Sets for the Demonstration

- Program Design
- Stakeholder and Community Engagement

New York State Energy Research and Development Authority (“NYSERDA”)

NYSERDA promotes energy efficiency and the use of renewable energy sources. These efforts are key to developing a less polluting and more reliable and affordable energy system for all New Yorkers. Collectively, NYSERDA’s efforts aim to reduce greenhouse gas emissions, accelerate economic growth, and reduce customer energy bills. NYSERDA works with stakeholders throughout New York including residents,

business owners, developers, community leaders, local government officials, university researchers, utility representatives, investors, and entrepreneurs.

NYSERDA Skill Sets for the Demonstration

- Administers EmPower New York Program (energy efficiency services program for income eligible customers)
- Referrals to other NYSERDA-administered programs such as (Assisted) Home Performance with ENERGY STAR® Program based on income eligibility

Solar Liberty

Solar Liberty is a Western New York-based turnkey installer of solar PV systems for residential, commercial, and utility scale applications. Over twelve years of operation, more than 90 MW of solar equipment has been distributed and installed. With a focus on New York State, Solar Liberty has over 1,300 successfully completed installations across New York, ranging from local 2.5 kW residential systems to the 10.6 MW array being built this year in Babylon, Long Island. Solar Liberty is honored to be the recipient of the “Outstanding Achievement Award” by both NYSERDA and the U.S. Department of Energy. Solar Liberty’s mission is to educate everyone and anyone who is interested in learning the value that solar energy brings. A critical part of this mission is to ensure solar energy is available to those in need. As evidence, Solar Liberty had donated 75 solar PV arrays, ranging from 25 to 50 kW in size, to New York State non-profits. The list includes the Buffalo City Mission, which is located in the Fruit Belt.

Solar Liberty Skill Sets for the Demonstration

- General Contractor in charge of all subcontracting partners
- Equipment procurement, warehousing, and logistics
- Solar site assessments
- Solar installation
- Solar maintenance and repairs
- Workforce development
- Community engagement and education support

General Electric Global Research (“GEGR”)

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 is the nerve center for innovative work across technologies and collaboration across GE’s businesses.

GEGR Skill Sets for the Demonstration

- Feeder network modeling
- Performance assessment

National Grid

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Roles & Responsibilities

NATIONAL GRID

Responsibility	Description
Project Management	Responsible for overall project management and coordination with partners, vendors and stakeholders
Stakeholder & Customer Engagement	Responsible for outreach to customers and partners
Billing	Responsible for testing and implementing billing system changes to accommodate billing the solar credit to participating customers
Credit and Collections	Responsible for managing test scenarios related to customer bill payment behavior and arrears management
Pricing	Responsible for solar credit rate development, any rate statement filings if necessary, final review of test bills
Meter Data Services	Responsible for collecting field data from the interval meters.
Meter Testing	Responsible for designing and installing complex metering installations.
Network Asset Strategy	Responsible for designing the communication systems and programming of the meters.
Procurement	Responsible for executing contracts with partners.
Data Analytics	Provides support for data analysis and billing inquiries.

PARTNERS

Partner	Description
<i>BNMC</i>	
Program Design	As a frequent partner with National Grid on energy issues, BNMC partnered with National Grid to design the Demonstration for the Fruit Belt.
Stakeholder and Community Engagement	Help facilitate communication and logistics with the Fruit Belt neighborhood, where BNMC already has established relationships.
<i>General Electric</i>	
Feeder network modeling	Designing and creating a model for the network baseline, use cases, and substation central control.
Performance assessment	Data collection and analysis to establish baseline, final performance, and control refinement.
<i>Solar Liberty</i>	
General Contractor	Solar Liberty will act as the general contractor for the Demonstration, managing the work of all subcontracting partners that will be contributing system components as well as premises' services such as roof repair contracting.
Procure solar PV panels, racking systems, micro-inverters, and generation meters	Solar Liberty will procure the components of the system including solar PV panels, racking, micro-inverters, generation meters, and any supporting equipment that is aligned with the goals of the Demonstration and will enable the testing of the use cases listed in the implementation plan.
Solar site assessments	Conducting the combined structural/solar assessments (roof ability to support solar, and whether electrical panels need repair/upgrade, as well as solar assessment, shading, orientation, etc.).
Solar site installations	All solar installation services, including permitting, electrical and mechanical work, and inspection and management of roof repair contractors.
Solar maintenance and repairs	Responsible for the long-term maintenance and repairs of the solar installations.
Workforce development	Recruit, train, and hire 5 local residents.

Warehousing & Logistics	Warehouse the materials and coordinate transportation of materials to each job site as required.
NYSERDA	
Energy Efficiency	Will provide access to the EmPower New York Program administered by NYSERDA that provides energy efficiency measures to eligible low-income participants as well as referrals to additional NYSERDA and/or other available programs.

Governance

Decision Making Body	
Utility Participation	Partner Leads
Ed White Vice President	Paul Tyno BNMC
Philip Austen Director	Adam & Nathan Rizzo Solar Liberty
Dennis Elsenbeck Director	Khaled Bahei-eldin GE Global Research
Fouad Dagher Director	Kevin Hale NYSERDA

Decision Making Logistics	
Meeting Format	Meeting Frequency
Workshop with full set of stakeholders on program goals and objectives	Annually
In-person performance evaluation and strategy- setting meeting with work stream owners and senior leadership from National Grid and partners	Quarterly
Short-format tactical conference call with key National Grid and partner work stream owners	Weekly
In-person or tactical as needed on program strategy and planning	Ad hoc

Work Plan and Budget

Work Plan

Description	Ownership	2015					2016					2017														
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Project Management																										
Develop/Finalize Implementation Plan	P. Austen (NGrid)				♦ Nov. 1 - Project starts																					
Finalize contracts with partners	J. Spring (NGrid)																									
Project Kick Off	P. Austen (NGrid)																									
Customer/Stakeholder Outreach																										
Phase 1 - Awareness	S. Brady (NGrid)																									
Phase 2 - Enrollment	S. Brady (NGrid)																									
Phase 3 - Installation	S. Brady (NGrid)																									
Solar Host Site Selection																										
Solar Assessments	R. Gauchat (Solar Liberty)																									
Site Selection, Design, and Permitting	R. Gauchat (Solar Liberty)																									
Solar Installation																										
Meter Installation	TBD (NGrid)																									
Permitting / Kit Assembly	R. Gauchat (Solar Liberty)																									
Solar Installation	R. Gauchat (Solar Liberty)																									
Billing System Prep for Solar Credits																										
Billing to determine requirements	M. Wilder (NGrid)																									
IS to perform changes to billing system	TBD (NGrid)																									
Workforce Development																										
Recruit local roofers	R. Gauchat (Solar Liberty)																									
Training program	R. Gauchat (Solar Liberty)																									
Commissioning and Grid Monitoring																										
Feeder Modeling and Simulation	C. Burns (NGrid) & GE																									
Substation Metering	C. Burns (NGrid)																									
Controls Integration	C. Burns (NGrid) & GE																									
Grid Testing	GE, NGrid																									
Reporting																										
Quarterly Reports	P. Austen (NGrid)																									
Final Project Report	P. Austen (NGrid)																									



Post-Demonstration

At the conclusion of the Demonstration, National Grid will evaluate final results of the Demonstration to inform how to proceed with the operation and ownership of the 100 solar PV systems. The Company will explore alternative ownership models for the existing panels, and the solar bill credits will be continued for Tier I solar hosts. National Grid will evaluate the continuation of the monetary credits for Tier II participants based on the Demonstration's resulting bill impacts.

Moreover, should the success of the Demonstration lead to contemplation of LMI solar PV demonstrations in other parts of the Company's service territory, National Grid will consider other ownership arrangements. The Company will continue to engage with various third parties to explore their willingness to participate.

Finally, while this Demonstration does not offer any new opportunities for participating customers to engage with their energy usage through new rate design options, National Grid will examine the potential for new price and rate design options that could be tested and/or proposed in the future. During the term of the Demonstration, the Company will capture and analyze participating customers' metering data to determine if, in fact, there are opportunities for future new and innovative rate designs.

Project Benefits and Costs

Benefits

The Demonstration expects to deliver several benefits, including tangible benefits that can be assigned monetary value as well as intangible benefits that are not easily quantified. This project and its learnings may serve as a future model for National Grid and other utilities to engage LMI communities through solar PV participation.

The following are assumptions made for the tangible benefits assigned monetary value:

- Solar credits for 150 customers in Tiers I and II will continue over the 25-year life of the solar units.
- All 300 participants will sign up for EE services.



- For those that qualify for NYSERDA's EmPower New York Program, on average, each customer would save approximately 679 kWh per year following installation of electric energy efficiency measures. At a rate of \$0.14 per kWh, that translates to \$95 per year.
- Through NYSERDA's EmPower New York Program, on average, each customer saves approximately 260 therms per year following installation of gas energy efficiency measures. At a rate of \$1.00 per therm, that translates to \$260 per year.
- The estimate for reduction in participant arrears is based on an internal analysis of customer accounts in the Fruit Belt (Substation 34). Using the average arrears balance for all accounts within that boundary, of which about 39% are in arrears, and assuming customers can reach a 5% reduction in arrears over a two-year period, it is expected that a total of \$450 reduction in arrears for a participant group of 150 (Tiers I and II participants) can result each year. Targets for reductions in arrears will be updated after the participant and control groups have been identified.
- A 15,000 kWh per year reduction in distribution line losses is estimated that would fall into the category Unaccounted for Energy ("UFE"), which would be valued at the wholesale market price. In NYISO Zone A for 2016, that would be approximately \$0.04 per kWh, translating to about \$600 per year. Targets for grid efficiencies will be updated after modeling analysis is conducted as part of the Demonstration.
- Installed capacity ("ICAP") value is already included through the solar bill credit calculations.

In addition to the benefits that are able to be quantified and monetized, the Demonstration garners the following intangible benefits:

- Greenhouse gas emission reductions
- Customer engagement in an underserved market
- Grid resiliency
- Community stewardship
- Local economic development, and
- Increased community awareness of energy-related issues



Costs

The following 10-year budget view breaks down costs and credits of the Demonstration compared with expected benefits. The budget for the Demonstration makes the following budgetary assumptions:

- Within the community boundary, 100 residential rooftops suitable to host solar PV arrays will be identified and secured for the project.
- A subset of the 100 residential rooftops suitable to host solar may require structural and/or electric panel 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 installations will qualify for the federal Investment Tax Credit (“ITC”) of 30%, as the Consolidated Appropriations Act of 2015 extended the 30% ITC. The Emergency Economic Stabilization Act of 2008 allowed investor-owned utilities eligibility to the 30% ITC. Prior to this, public utilities were not eligible for ITC benefits.¹⁰

Project Benefit and Cost Summary

(Following page)

¹⁰ Michael Mendelsohn and Claire Kreyck, 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.



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Years 10-25	Total
Estimated Value of Benefits											
Customer Electric Bill Savings from EmPower NY Energy Efficiency	\$28,500	\$28,500	\$28,500	\$28,500	\$28,500	\$28,500	\$28,500	\$28,500	\$28,500	\$28,500	\$285,000
Customer Gas Bill Savings from EmPower NY Energy Efficiency	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$858,000	\$1,560,000
Customer Electric Bill Savings from Solar Bill Credits	\$13,500	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$432,000	\$661,500
Reduction in Participant Arrears	\$450	\$450	\$450	\$450	\$450	\$450	\$450	\$450	\$450	\$7,200	\$11,250
Reduction in Distribution Line Losses	\$300	\$600	\$600	\$600	\$600	\$600	\$600	\$600	\$600	\$9,600	\$14,700
Total Value of Benefits	\$120,750	\$134,550	\$134,550	\$134,550	\$134,550	\$134,550	\$134,550	\$134,550	\$134,550	\$1,335,300	\$2,532,450
Revenues											
Project Revenues	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Rebates	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Tax Credits											
30% Fed Income Tax Credit (ITC)	\$715,584	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$715,584
Total Revenues & Credits	\$715,584	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$715,584
Operational Expenditures	\$2,092,200	\$240,000	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$30,554	\$2,382,200
General Admin & Planning											
National Grid	\$15,000	\$15,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,000
Partners	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Marketing and Workforce Development											
National Grid	\$50,000	\$125,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$175,000
Partners	\$75,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$75,000
Incentives											
National Grid	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Partners	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Implementation											
National Grid	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Partners	\$1,727,200	\$0	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$30,554	\$1,777,200
Evaluation & Analysis											
National Grid	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Partners	\$225,000	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$325,000
Capital Expenditures	\$1,410,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,410,000
(100) Solar PV Systems											
National Grid	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Partners	\$1,400,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,400,000
(100) Generation Meters & Channels											
National Grid	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Partners	\$10,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,000
Total Expenditures	\$3,502,200	\$240,000	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$2,778	\$30,554	\$3,792,200
Net Cash Flow	-\$2,786,616	-\$240,000	-\$2,778	-\$2,778	-\$2,778	-\$2,778	-\$2,778	-\$2,778	-\$2,778	-\$30,554	-\$3,076,616
Net Benefits to Costs	-\$2,665,866	-\$105,450	\$131,772	\$131,772	\$131,772	\$131,772	\$131,772	\$131,772	\$131,772	\$1,304,746	-\$544,166

Reporting Structure

Reporting Expectations

Measures, Results, and Relevant Information	Reporting Frequency
Program Results	
Customer interest, participation data by Tier, and solar installation progress	Quarterly
Avg. solar bill credit value	Quarterly
Collections Rate and Arrears Change Rate	Quarterly
Grid efficiency metrics	Frequency TBD
Progress report, including performance against timeline and budget	Quarterly

Appendix 1: BNMC Neighborhood Engagement Examples

Successful Fruit Belt Neighborhood Engagement Examples led by the BNMC:

Four Neighborhoods One Community Master Plan & Update

The 2010 BNMC Master Plan Update revisited broad strategies that were laid out in the first BNMC Master Plan undertaken in 2003. Among other things, the update established a planning framework to accommodate the growth in surrounding neighborhoods into the future. The Fruit Belt Neighborhood Plan was developed through a comprehensive and community-oriented process. Integrated through all aspects of the planning effort was a commitment to community engagement and coordination with other planning initiatives. Planning for the Fruit Belt involved a comprehensive consultation process that included interviews with a wide variety of stakeholder groups from the public, private, and non-profit sectors including the City of Buffalo, community development organizations, housing organizations, neighborhood and civic organizations, the NFTA, and BNMC member institutions.

After the completion of the BNMC Master Plan Update, the creation of the “Four Neighborhoods, One Community” Quarterly Stakeholder Meetings were formed. This meeting brings together the surrounding neighborhoods to discuss pertinent initiatives and potential collaborative opportunities between the Medical Campus and the neighborhoods.

Fruit Belt Leadership Training

The 2010 Master Plan Update included feedback from Fruit Belt Neighborhood residents to identify the issues specific to the neighborhood, develop implementation strategies, and establish support for action and investment in the neighborhood. One of the key resident issues was building a unified voice. As a result of this feedback, the University at Buffalo and BNMC, Inc. decided to partner with Medical Campus member institutions to provide a four-month leadership training to address this issue. Member institutions on the BNMC such as the University at Buffalo, Kaleida Health, Roswell Park Cancer Institute, and others have helped to make a difference in the Fruit Belt community by providing leadership training for stakeholders and dedicated community members to provide them with the resources and skills necessary to continue to effect change in the Fruit Belt. As community leaders learned how to strategically leverage partnerships with organizations on and near the BNMC, the training provided an opportunity to pass on knowledge that will lead to a healthier and more sustainable Fruit Belt neighborhood.

The results-oriented training, useful within any organizational structure, included an in-depth look at skills such as team building, effective decision making, project management, budgeting, meeting management, and more. As the residents continue to invest their time and resources in the betterment of their historic neighborhood, the mark left will indeed be a stronger and more unified community. Impacts of the training include the formation of Orchard Community Initiative, formed by several block clubs and civic associations within the Fruit Belt after the Leadership Training. This group was given \$7,500 by the BNMC, Inc. to build upon a project in the neighborhood of their choice. OCI offers minor home repairs in conjunction with Westside Neighborhood Housing Services.

Community Canvassing/JARC grant

The “Job Access, Reverse Commute” grant was a collaborative effort between the BNMC, Inc., Buffalo CarShare, and GoBike Buffalo to facilitate and encourage the use of alternative transportation modes and public transit among employees on the BNMC and residents of the surrounding neighborhoods, including the Fruit Belt. In addition, the program aimed to increase the number of neighborhood residents employed at BNMC institutions by providing better access to career and training opportunities available on and around the Medical Campus. Canvassers employed by the BNMC, Inc. knocked on 5,000 doors within a one-mile radius around the campus and had 1,500 conversations regarding workforce and transportation barriers. As a result of the canvassing, BNMC was able to build relationships, identify GoBuffalo Champions who acted as liaison between BNMC and the neighborhood, and educate residents about opportunities on the Medical Campus for workforce training. In addition, 170 bike helmets were distributed and the canvass was credited with increasing GoBike and Buffalo CarShare memberships.

Active Living by Design/Robert Wood Johnson Foundation Grants

Part of the BNMC’s focus is in creating and maintaining sustainable environments for the greater community as well as employees, patients, and visitors to the Medical Campus. In 2009, the BNMC received two grants totaling nearly one million dollars from the Robert Wood Johnson Foundation to support environmental and policy changes to increase active living and healthy eating in our overall community, including adjacent neighborhoods. As part of the program, the BNMC sought input from local residents for their views on necessary changes in the community that would eventually lead to policy changes and infrastructure improvements to support healthy active living. The BNMC put an emphasis on youth engagement in this process that also led to the formation of the Youth Advisory Council, providing a voice to the City’s younger residents. The impact of the grants and BNMC’s work in this area helped to improve infrastructure that

supports active living, and helped to create policies to develop a healthier food system and in support of environmental changes to enhance healthy lifestyles.

BNMC Team

Ekua Mends-Aidoo, Manager of Community Relations, leads the community relations/outreach function for the Buffalo Niagara Medical Campus, Inc. Ekua meets regularly with the neighbors within a mile radius of the campus, fostering a strong working relationship on opportunities of collaboration. Several BNMC team members are engaged in neighborhood engagement efforts on issues related to transportation, parking, workforce and procurement initiatives, and food and active living programs.

Ekua also leads the BNMC's Corporate Social Responsibility plan, which is currently being designed to focus on engagement within the neighborhoods through volunteering efforts, sponsorships, and events. In addition, BNMC team members have an active presence in a number of neighborhood organizations and are frequent participants in community events and outreach efforts.

Appendix 2: Letters of Support

(Following pages)



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,

A handwritten signature in blue ink, appearing to read "E. White", with a long horizontal line extending to the right.

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



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.

Board Officers

William L. Joyce
Chair
Anthony B. Martino
Vice Chair
James R. Biltekoff
Vice Chair
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Satish Tripathi, PhD
Donald L. Trump, MD

Members

Allentown Neighborhood
Buffalo Hearing & Speech Center
Buffalo Medical Group, PC
Center for Hospice & Palliative Care
Fruit Belt Neighborhood
Hauptman-Woodward Medical Research Institute
Kaleida Health
Olmsted Center for Sight/Ross Eye Institute
Roswell Park Cancer Institute
University at Buffalo
Unyts





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.

A handwritten signature in cursive script, appearing to read 'Kelly Fletcher'.

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 be 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



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.

A handwritten signature in black ink, appearing to read 'Jeff Popielarczyk'.

Jeff Popielarczyk
Business Development 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:

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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

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



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,

A handwritten signature in black ink, reading "Zaid B. Islam", is positioned above the printed name.

Zaid B. Islam
President
Orchard Community Initiative



NYSERDA

ANDREW M. CUOMO
Governor

RICHARD L. KAUFFMAN
Chair

JOHN B. RHODES
President and CEO

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

Re: Fruit Belt Neighborhood Solar REV Demonstration Project

Dear Mr. White:

On behalf of NYSERDA, we are pleased to be partnering with National Grid to deliver solar and energy efficiency solutions to the residents of the Fruit Belt neighborhood in Buffalo as part of this Reforming the Energy Vision (REV) demonstration project. This model will serve to leverage National Grid and the Buffalo Niagara Medical Campus's existing relationships with the community as well as the New York State Energy Research and Development Authority's (NYSERDA) efforts to increase energy affordability and access to clean energy solutions in low-to-moderate income communities.

Through the direct installation of residential solar systems and the delivery of energy efficiency services to homeowners, the proposed project aims to accelerate the community's adoption of clean energy in an innovative way, generate jobs in the Buffalo-Niagara region, and expand access to clean energy options for low-moderate income households. In addition to reducing energy consumption, the incorporation of energy efficiency in this project seeks to achieve greater carbon emission reductions, increased system-wide efficiency, enhance energy literacy for customers, and positively contribute to a reduction in utility bill arrearages.

We are excited for the opportunity to partner with National Grid on this REV demonstration project. Please do not hesitate to contact me at 518-862-1090 x3266 if you require any additional information.

Sincerely,

A handwritten signature in black ink that reads "K C Hale".

Kevin C. Hale

Director, Utility Affairs and Strategic Partnerships

New York State Energy Research and Development Authority

Albany

17 Columbia Circle, Albany, NY 12203-6399
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New York City

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(P) 212-971-5342
(F) 518-862-1091

West Valley Site

Management Program
9030-B Route 219
West Valley, NY
14171-9500
(P) 716-942-9960
(F) 716-942-9961

January 17, 2017

VIA ELECTRONIC DELIVERY

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

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

**NATIONAL GRID: CLIFTON PARK DEMAND REDUCTION REV
DEMONSTRATION PROJECT-IMPLEMENTATION PLAN**

Dear Secretary Burgess:

Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid”) hereby submits for filing the Clifton Park Demand Reduction REV Demonstration Project Implementation Plan as required by the REV Demonstration Project Assessment Report (“Assessment Report”) filed by the New York State Department of Public Service Staff (“Staff”) with the Commission on December 1, 2016 in Case 14-M-0101.¹

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

¹ The Assessment Report was re-issued on December 28, 2016, removing references to a trademarked term and a trademarked acronym.

Hon. Kathleen H. Burgess, Secretary
National Grid: Clifton Park Demand Reduction REV Demonstration Project
Implementation Plan Filing
January 17, 2017
Page 2

National Grid looks forward to continuing to work collaboratively with Staff as it proceeds with the implementation of the Clifton Park Demand Reduction REV Demonstration Project.

Respectfully submitted,

/s/ Karla M. Corpus

Karla M. Corpus
Senior Counsel

Enc.

cc: Marco Padula, DPS Staff, w/enclosure (via electronic mail)
Christian Bonvin, DPS Staff, w/enclosure (via electronic mail)
Denise Gerbsch, DPS Staff, w/enclosure (via electronic mail)
Allison Esposito, DPS Staff, w/enclosure (via electronic mail)
Melanie Littlejohn, w/enclosure (via electronic mail)
Cathy Hughto-Delzer, w/enclosure (via electronic mail)
Philip Austen, w/enclosure (via electronic mail)
Janet Audunson, w/enclosure (via electronic mail)
Melissa Piper, w/enclosure (via electronic mail)
Kara Fedors, w/enclosure (via electronic mail)
Pamela Dise, w/enclosure (via electronic mail)
Carol Teixeira, w/enclosure (via electronic mail)



Demand Reduction REV Demonstration Project

in

Clifton Park, New York

Implementation Plan

Case 14-M-0101

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EXECUTIVE SUMMARY

On July 1, 2016 Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid” or the “Company”) filed a proposal for the Demand Reduction REV Demonstration Project (the “Project”)¹ designed to provide residential customers in the Town of Clifton Park (“Clifton Park” or the “Town”) with price signals, tools and information, enabled by infrastructure investments and distributed energy resources (“DER”),² to reduce electric demand during peak times and inform the Reforming the Energy Vision (“REV”) proceeding. The purpose of this implementation plan (the “Implementation Plan”) is to describe National Grid’s detailed execution plans for the Project.

The Project aligns with the New York Public Service Commission’s (“Commission”) Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (“REV Track Two Order”) wherein the Commission asserts “[o]ne of the most important objectives of REV is improving overall system efficiency including the efficiency of capital investment to create value for customers. Toward that objective, electric peak reduction is among the most immediate priorities for REV implementation.”³

National Grid believes that it is possible to create more responsive relationships with customers by leveraging critical infrastructure, customer outreach and engagement, deep energy insights and actionable information, as well as price signals and DER products and services, which incentivize customers to reduce peak electric load and overall electric and gas energy use. Toward that end, the following elements are included in the Project:

- Infrastructure
 - Advanced Metering Functionality (“AMF”)
 - Volt/VAR Optimization (includes Conservation Voltage Reduction) (“VVO”)
- Customer Outreach & Engagement
- Deep Energy Insights & Actionable Information
- Price Signals
 - Peak Time Rewards (“PTR”)
 - Voluntary Time-of-Use (“VTOU”) Rate
- DER Services
- Community Choice Aggregation (“CCA”) Support

¹ National Grid’s July 1, 2016 submittal was an errata filing to replace the proposed Customer Convenience Demonstration Project for Clifton Park, contained within the Company’s July 1, 2015 submittal of a suite of REV demonstration projects, with a renamed project entitled “Demand Reduction Demonstration Project” to reflect the substantial revisions in scope from the original July 1, 2015 filing.

² For the Clifton Park REV Demonstration Project, “DER” is defined as including energy efficiency, demand response, and renewable distributed generation offerings, consistent with the Commission’s definition in Case 14 -M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* (“REV Proceeding”), Order Instituting Proceeding (issued April 25, 2014), p. 25.

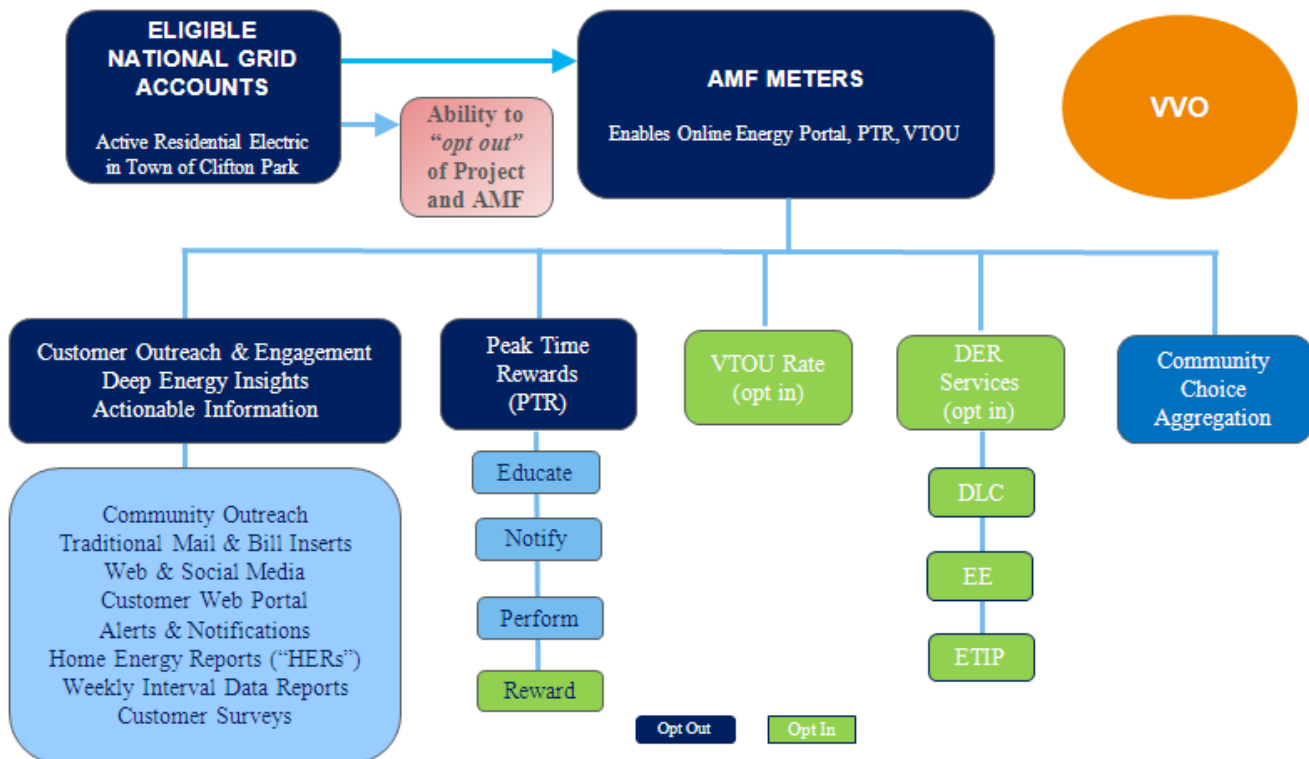
³ REV Proceeding, Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (“Track Two Order”) (issued May 19, 2016), p. 72.

PROJECT DESIGN

Project Components Details

A summary of the Project’s key services and offerings are provided below in Figure 1 (Project Overview Diagram). With the exception of VVO, customers can opt-in or opt-out of each Project element. A description of each Project element follows.

Figure 1: Project Overview Diagram⁴



Infrastructure

National Grid will install infrastructure intended to provide benefits to the Company’s Clifton Park customers and enable other key Project elements. These infrastructure enhancements include:

- AMF; and
- VVO.

⁴ Note: A customer who opts out from the AMF meter installation will still have access to monthly consumption and other data on the web portal. Although PTR is an opt-out Project element, a customer will need to accept the terms and conditions on the vendor’s website (*i.e.*, opt in) in order to earn points and rewards.

AMF

National Grid, working with its partners in the Project, will replace the existing electric meters installed at residential premises in Clifton Park with Commission-approved meters that have the capability of communicating, through cellular technology, near real-time electric interval data to these customers.⁵

Existing gas meters will also be upgraded to communicate gas usage through the electric meters. These enhanced metering capabilities are designed to:

- Provide customers with access to near real-time data about their electrical and gas usage;
- Provide greater knowledge of residential customers' load shapes;
- Enable timely messaging to customers about their energy consumption allowing for proactive energy consumption decisions;
- Allow valuation of electric demand response (*e.g.*, rewards to customers) based on projected and actual demand;
- Support the assessment and possible monetization of the impact PTR events may have on installed capacity ("ICAP") tags for electric mass-market customers, and
- Facilitate the offering of new services and functions.

AMF deployment in Clifton Park will replace existing National Grid meter reading and billing processes. AMF meters will be read and data transferred over the cellular network to National Grid for utility billing. Data will also be transferred to Project partners over secure networks in order to enable Project elements including the customer web portal. Interval data will also be used for Project deployment of PTR, billing of the VTOU rate, and to support authorized Project evaluation activities.

AMF deployment is anticipated to commence the end of the first quarter of 2017. Customer letters introducing the Project and the AMF installation process will be distributed at least one month meter installations begin. This allows for a period during which customers can opt out of the AMF metering technology as well as certain other aspects of the Project.

Customers choosing not to have AMF installed will be directed to a specialized team at the National Grid contact center. The contact center will direct Customer Meter Services ("CMS") to not install an AMF meter for those customers who choose to opt out. These customers will retain their existing automatic meter reading ("AMR") meter, or if they had previously elected the "AMR Opt-Out Option,"⁶ retain a non-AMR meter. Additionally, during the Project term, customers will have the option to have their AMF meter removed and replaced with an AMR meter at no cost to the customer.

⁵ Case 16-E-0023, *Petition of Itron Inc. for Approval of the OpenWay Centron 4G LTE Commercial Meter Line*, Order Approving Itron OpenWay Centron 4G LTE Commercial Meter (issued November 23, 2016). The meter vendor, Itron, is assessing whether future changes to the cellular communication network used for the AMF rollout (*e.g.*, "4G" to "5G") would require upgrades to meter hardware and/or software. For the three years of the Project, the vendor anticipates no changes to the cellular network requiring hardware or software upgrades. National Grid, in collaboration with the vendor, will continue to assess the impacts of cellular communications network changes when assessing scalability of the Project.

⁶ See P.S.C. No. 220 Electricity, Niagara Mohawk Power Corporation d/b/a National Grid, Schedule for Electric Service ("National Grid Electricity Tariff"), Rule 25.6, *et seq.*

National Grid will track the number of targeted customers that choose to opt out of AMF during the initial opt-out period, as well as those choosing to have AMF meters removed during the Project term.

Existing AMR meters that will be replaced by AMF technology will be cataloged and reviewed for depreciation status. National Grid will work with New York State Department of Public Service Staff (“Staff”) to ensure proper accounting for meters that are depreciated and retired.

The steps for AMF deployment:

First Article Meters ⁷ delivered to National Grid	January 6, 2017
User Acceptance Testing Complete	February 2017
Go Live Declared	March 2017
Field Deployment of Meters	Through May 31, 2017

VVO

National Grid will enhance the efficiency of the electric distribution system through the installation of software and devices that better regulate the voltage of the distribution system. These system enhancements will benefit all customers connected to the substations being upgraded. Working with the Project’s VVO partner, National Grid will install devices on the distribution system that monitor voltage along with advanced controllers for voltage regulators and reactive capacitors.

National Grid will evaluate the extent to which optimized regulation of the voltage and power factor of the electric distribution system benefits customers, ultimately reflected by improved feeder power factor, flatter voltage profiles, reduced feeder losses, reduced peak demand, and reduced energy consumption by customers.

VVO will include:

- Three Substation Transformer Load Tap Changers;
- Eleven Feeders, including:
 - 11 Line Voltage Monitors,
 - 39 Advanced Switching Capacitors, and
 - 8 Pole Top Regulators;
- Central controller and data concentrator installed at the National Grid Control Center in Liverpool, New York;
- Supervisory control through supervisory control and data acquisition (“SCADA”) and Energy Management System (“EMS”), and
- Cellular connectivity between all field, substation devices, and the data concentrator.

⁷ First article meters are initial production runs made to validate specifications and built before manufacturing the entire meter population.

The schedule for VVO deployment is as follows:

Elnora circuit devices installed	May 2017
Grooms Road circuit devices installed	September 2017
Elnora Substation make-ready work	May 2017
Grooms Road Substation make-ready work	June 2017
VVO system commissioning	November 2017
VVO fully deployed	December 2017

Customer Outreach and Engagement

National Grid will engage residents of the Clifton Park community to educate energy consumers about the Project and solicit input. The strategies to be used include:

- Community outreach;
- Mail and bill inserts; and
- Web and social media.

Community Outreach

To effectively engage the Town, National Grid will work to engage community leaders through coordination with the Town leadership, small group meetings with targeted organizations, and open community-wide meetings.

Coordination with Town leadership

National Grid will work with the Town leadership, particularly the Government Re-Thinking Energy & Environment Now (“G.R.E.E.N”) Committee, to refine many of the important Project details.

National Grid anticipates meeting with Town leadership on a monthly basis to provide key Project updates and receive Town feedback on Project progress. If meetings are not necessary or impractical in a given month, National Grid may provide written progress updates and solicit feedback where appropriate. The below Table 3 summarizes engagement with the Town to date.

Table 3: National Grid Town Engagement to Date

Meeting Date	Agenda
August 26, 2016	Met with Town leaders to discuss a CCA-like energy procurement model
September 12, 2016	Discussion of Project status and discussion of Town leaders’ interest in CCA
October 14, 2016	Follow-up meeting on Project status and interest in CCA with those Town leaders that requested additional information

Small group meetings with targeted organizations

National Grid will reach out to key community organizations to understand their concerns and expectations for the Project. National Grid's goal is to create ongoing outreach and communication opportunities with groups from a wide range of social networks within the community. These groups can include faith-based communities, neighborhood associations, schools, sports and recreation groups, book clubs, civic organization, and employers. National Grid believes that engaging these groups throughout the Project will build a steady stream of participation.

Specifically, National Grid will engage these community organizations in the following manner:

- Identify and engage local contractors, retailers, and others in the business community that can market, sell, and install DER products and services;
- Reach Clifton Park customers to educate them about Project opportunities (*e.g.*, PTR, DER products and services, VTOU pricing, etc.), and
- Solicit feedback on key aspects of the Project.

Open community-wide meetings

National Grid will also engage Town leadership at meetings open to the entire community through a series of Town meetings. The goals of these meetings are to:

- Gauge community buy-in to the Project from engaged community members, collecting contact information for future engagement;
- Solicit ideas for additional energy services important to the community for inclusion in the Project, and
- Educate Town leaders on key aspects of the Project (*e.g.*, VTOU pricing) that they can promote through their personal networks.

Each outreach approach is intended to reinforce others to build awareness, interest, and participation in the Project. By providing multiple opportunities to interact, SC-1 customers will receive more information to make educated decisions about energy use while National Grid will remain apprised of additional community education opportunities.

Prospective Tactics	February				March				April				May				
	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29
Tabling: Clifton Park Shopping Center	X				X				X				X				
Classroom Prep: Shenendehowa Central Schools (1 HS, 3 MS, 8 ES)			X				X				X				X		
Tabling: Clifton-Park Halfmoon Public Library		X				X				X				X			
Tabling: Clifton Park Town Justice (Clifton Commons)				X				X				X					X
Tabling: YMCA Clifton Park		X				X				X				X			
Cap Region Spring Home Show										X							
Science and Health Discovery Night (Shen H.S.)												X					
Van: Clifton Park Winterfest	X																
Van: Clifton Park Farmers Market (Date TBA: Summer 2017)																	
Van: Clifton Park Farm Fest (25th Annual) - (Date TBA: Fall 2017)																	

Mail and Bill Inserts

Prior to the installation of AMF, National Grid will deliver a set of communications to introduce Clifton Park customers to the new interval meter benefits and key Project elements available immediately and in the future. These communications will be sent in the form of reports delivered by direct mail, bill stuffers, and email (see attached Appendix B - Sample Smart Energy Introduction Letter to Customers, and Sample Bill Insert from National Grid affiliate's Worcester Smart Grid Pilot, for examples from other smart energy pilots). National Grid will send a welcome packet prior to the installation of AMF focused on education. Following the installation of AMF, customers will receive educational materials focused on the various Project elements. Table 4 below summarizes the outgoing communications to customers by type, volume, and date.

Table 4: High-Level Project Rollout Schedule

Project Element	Mail Volume	Mail Dates
Meter Letter	14,409	February 2017
Welcome Letter	13,689	Rolling basis
Points and Rewards Enrollment	11,609 ⁸	Rolling basis
VTOU Rates	14,409	March –April 2017
DER Opportunities	14,409	November 2017

In all communications to customers, National Grid will provide a dedicated phone number and trained team of representatives who will be prepared to answer questions on Project specifics.

Web and Social Media

National Grid continues to expand the existing Clifton Park micro-site, a component of the Company's current nationalgrid.com website, to include information on the Project for all Clifton Park residents. The Project website will include the following information:

- AMF details including technology specifics, rollout schedule, and opportunity to opt out;
- Information about PTR and the VTOU rate;
- Energy services information and sign-up options for DER products and services immediately available and services that will be available once AMF is installed (*e.g.*, PTR); National Grid will include bi-weekly or monthly geo-targeted content to the Clifton Park area in the Facebook and Twitter editorial calendars. Content will include Project updates and customer stories gathered in the field. National Grid will create the post(s), set-up targeting, monitor and reply to

⁸ Assumes 20% of targeted Clifton Park customers are already participating in the existing National Grid electric and gas energy efficiency programs, the Electric Residential Engagement Program and the Gas Residential Engagement Program (formerly known as the Residential Building Practices and Demonstration Programs), and are already receiving HERs and enrolled in the associated Points and Rewards offerings. Analysis to confirm Point and Rewards enrollment of the Clifton Park population is in progress.

customer inquiries, and provide metrics. Web and social media avenues will include frequent content updates as outlined below. Ngrid.com/cliftonpark will be updated throughout the year to announce the rollout of new products and services and will include Project-specific information;

- Bill inserts will be incorporated four times per year as new Project elements are rolled out, and
- Social media updates will be on-going throughout the year.

See Appendix B, Sample National Grid Affiliate's Social Media Messages, for examples of National Grid Facebook posts.

Customer Research

National Grid will deploy customer surveys to support analysis and tracking of progress on hypothesis test questions and to support the Project deployment. Surveys will gather information on customer attitudes and experiences on various Project elements. The information gathered will identify outreach and engagement approaches that may need to be modified to further enhance customer participation.

An initial baseline survey of Clifton Park residents was deployed in October 2016. This research indicated that customer age ranges have different needs to support their energy decisions. Given these research findings, National Grid will segment the Clifton Park customer population by age as well as their current level of HERs participation (via the Company's existing Electric Residential Engagement Program and Gas Residential Engagement Program), to allow for tailored messaging to better support customer segments throughout the Project. The identified segments are:

- HERs⁹ participants who currently log in and use the portal to view their monthly energy usage;
- HERs Participants who have never logged into the portal; Young (18-54);
- HERs Participants who have never logged into the portal: Older (55+);
- HERs Non-Participants; Young (18-54), and
- HERs Non-Participants; Older (55+) SC-1 eligible non-residential accounts (*e.g.*, religious-based organizations).¹⁰

Future Project surveys will be rolled out strategically with the deployment of different aspects of the Project. For example, a survey may be deployed after meter installations are complete and initial AMF education materials are distributed to provide feedback on customer experiences with meter exchanges and the effectiveness of AMF education.

Deep Energy Insights and Actionable Information

National Grid will work with the Company's engagement partner to increase customer engagement by providing interactive energy insights and actionable information. Customers will be presented with actionable energy information and will be provided with messaging about the benefits of energy

⁹ *Id.*

¹⁰ Non-residential SC-1 eligible accounts provide an opportunity for community-based engagement within this Project.

efficiency, demand reduction, and pricing programs that encourage shifting energy usage to lower price, off-peak times of the day.

Customers will be engaged in energy insights and actionable information via a variety of channels and strategies, including digital communications, traditional mail, a customer web portal, alerts and notifications, HERs, customer education reports, and weekly reports.

Customers who do not wish to receive specific communications can choose to opt out by notifying National Grid. Customers will be engaged via the channels outlined in the below Table 5 (Customer Communication Channels).

Table 5: Customer Communication Channels

Communication Channel	Description
Web Portal	National Grid web experience will be customized for Clifton Park customers and will present electricity and gas usage, and behavioral messaging. (Visit at ngrid.com/cliftonpark)
High Bill Alerts	High bill alerts delivered via email. Alerts will utilize AMF data to identify customers trending towards a high bill and inform them of a potential high bill.
Home Energy Reports (“HERs”)	The existing HER channel will be leveraged to promote tailored energy-saving products and services.
Emailed Home Energy Reports (“eHERs”)	The existing eHERs messaging channel will be leveraged to promote energy-saving products and services.
Weekly Interval Data Reports	Customers with AMF will be sent an opt-in weekly interval data report via an email giving them insights on how they are using energy on a weekly basis.

Web Portal

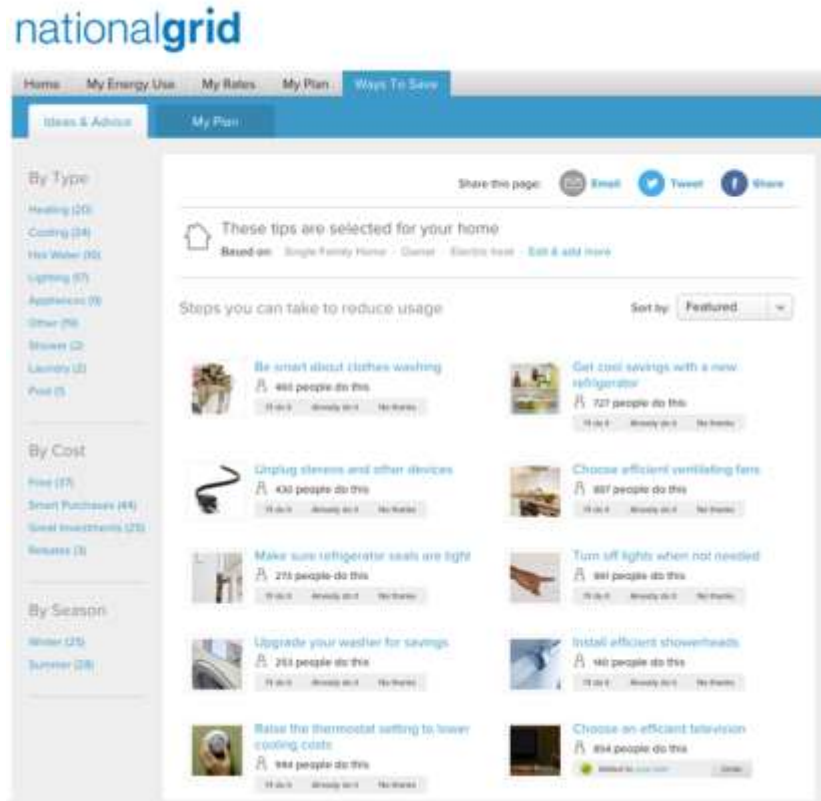
Customers will be engaged through the National Grid website, which will have customized data presentment specific to Clifton Park customers. Prior to AMF rollout, the digital experience will include monthly electric and gas usage information, and promotional messaging about National Grid energy-saving products and services. The digital experience will be significantly enhanced after AMF meters are installed. Specifically, customers will have access to the following features:

- Interval energy usage tracking (See Figure 4);
- Energy savings recommendations (See Figure 5), and
- Energy usage alerts (See Figure 6).

Figure 4: Energy Usage Tracking



Figure 5: Energy Savings Recommendations



High Bill Alerts

In addition to displaying alerts on the web portal, high bill alerts will be sent by email (see Figure 6 below) when customers are on track to exceed their typical energy usage each month. This usage threshold and notification date will be set by National Grid with input from the Company's engagement partner. These alerts will also include links ("calls to action") on how customers can save energy.

National Grid will aim for limited frequency of alert messages to any individual customer.

Home Energy Reports

National Grid currently delivers HERs to approximately 8,000 customers in Clifton Park through ongoing National Grid energy efficiency programs, the Electric Residential Engagement Program and the Gas Residential Engagement Program, as detailed in the Company's Energy Efficiency Transition Implementation Plans (ETIPs).

Weekly Interval Data Reports

National Grid will send weekly interval data report emails to customers that have AMF meters installed. These reports will give customers additional insights into the daily electricity usage and provide behavioral nudges and targeted tips to promote energy conservation.

Figure 6: Email Message Usage Alerts



Price Signals

National Grid's goal is to design electric energy price signals that achieve the greatest possible impact in the form of reduced peak energy usage in order to better align usage patterns with the realities of the electric grid, recognizing the location, time, and attributes of energy reductions.

Ultimately, reducing peak electric energy usage will benefit customers by lowering the amount of expensive peak energy procured, minimizing the cost to operate the electric grid, and decreasing the need for additional infrastructure investment.

To reach this goal, National Grid will balance the following factors:

- Peak reduction per customer;
- Number of customers participating, and
- Customer satisfaction.

The Project seeks to test if residents are presented with energy price signals whether they will act to reduce local and system peak loads. The Project is designed to offer two forms of price signals: PTR and the VTOU rate. PTR provides rewards for taking action at specific times, while the VTOU rate design provides pricing that encourages off-peak energy use.

PTR

Through a single marketing message, “Reduce Your Energy Usage and Earn a Gift Card Reward,” National Grid will seek to incentivize Clifton Park customers to reduce electric use during specified peak times. Participating customers will be rewarded for curtailing electric load through behavioral actions such as turning off lights and adjusting their thermostats.

Key elements of PTR include:

- Event performance analytics performed on all customers with AMF;
- No penalties for failure to reduce load during PTR events;
- Pre-event and post-event notifications;
- Rewards earned by those enrolled in “Points and Rewards”; and
- Rewards awarded based on participation in up to 20 PTR events per year.

Event performance analytics

All electric customers that receive an AMF meter will be targeted for PTR. This will provide insight on community-level load curtailment. Event analytics will be performed comparing modeled expected consumption to actual consumption based on AMF interval data during the event period. Determinations will be made whether Project participants curtailed electric load or not.

Customers that choose to opt out of PTR will not receive PTR notifications. Customers can opt out of PTR even if they have an AMF meter.

No penalties

PTR is a rewards program based on positive motivation. There are no penalties for failure to curtail load during events.

Pre-event and post-event notifications

Pre-event notifications will inform customers of the time frame and date of event with recommendations on how to reduce usage during the event.

Post-event notifications will inform customers if their data reflected they curtailed load during the event, and whether they earned points that can be redeemed for rewards.

“Points and Rewards” enrollment

In order for individual customers to earn rewards they must enroll in “Points and Rewards” and accept the vendor’s terms and conditions.

Awarding and distributing rewards

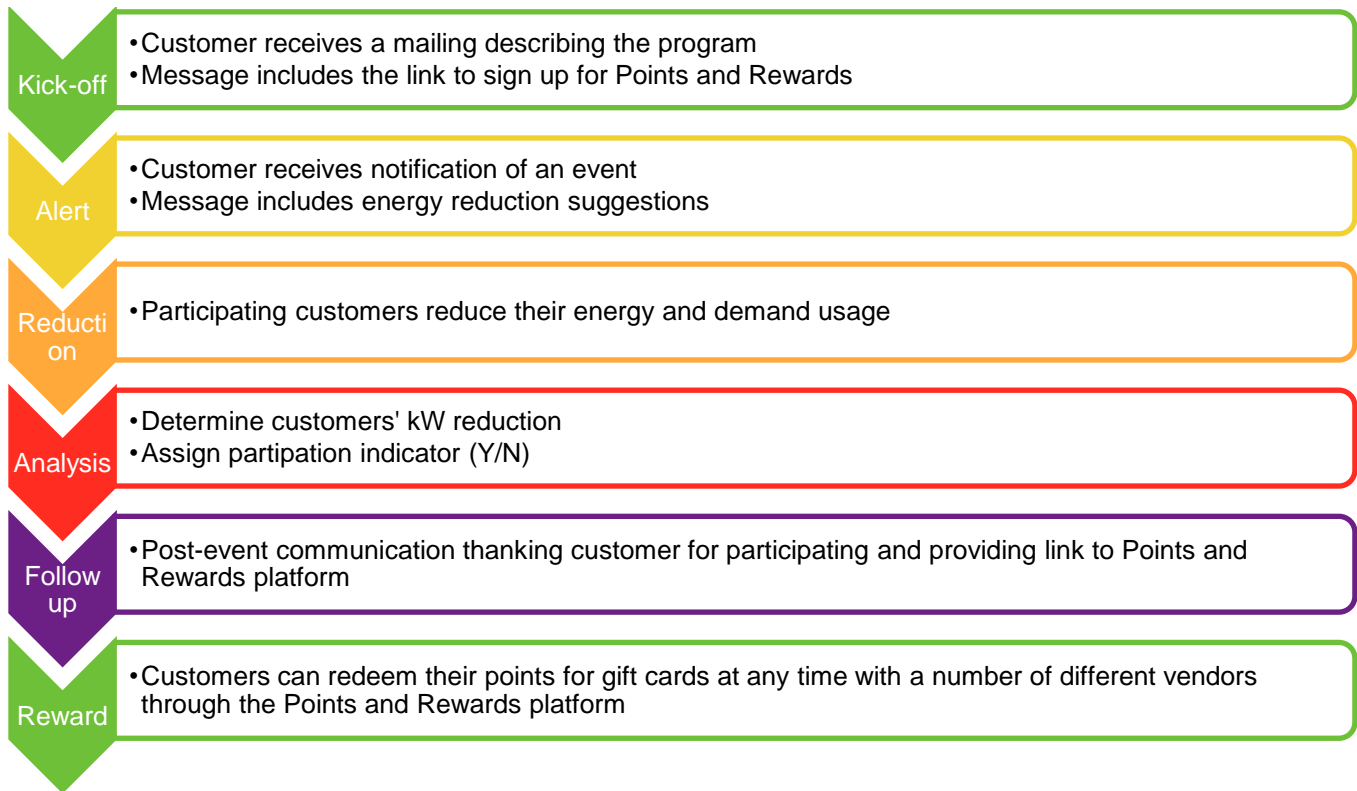
There may be up to 20 PTR events per year during the summer electric capability periods of June through September. Rewards will be awarded based on whether or not individual customer data reflects electric load curtailment during specified events compared to modeled expected load. Customers are able to earn points for each event and can redeem points for rewards at any time

PTR events will be called by National Grid, and may be triggered by a number of indicators that will be further defined. Some examples of peak event triggers include:

- High Day Ahead Locational Marginal Price (“LMP”);
- High temperature;
- High humidity; and
- Various electric transmission restrictions that may arise (*e.g.*, feeder specific).

Figure 7 below provides an overview of the PTR program.

Figure 7: PTR Customer Experience



Key PTR schedule items:¹¹

PTR education communications	2 nd Qtr. 2017
Launch event period	3 rd Qtr. 2017 (and annually through September 2019)
Evaluation of PTR performance	4 th Qtr. 2017

VTOU Rate

The VTOU rate¹² will be tested in Clifton Park on an opt-in basis. The VTOU rate, which became effective December 1, 2016, includes three rate periods: on-peak, off-peak and super-peak. Delivery rates differ for on-peak and off-peak usage, and commodity rates vary based on customers' on-peak, off-peak and super-peak usage. The specific time-of-use periods are as follows:

¹¹ Time periods shown are predicated on having the engagement vendor under contract by the end of the 1st Qtr. 2017. If that is not achievable, dates shown will likely slip. Any schedule changes will be reflected in Project Quarterly Reports.

¹² See National Grid Electricity Tariff, Service Classification 1, Special Provision L, "Residential Optional Time of Use Delivery and Commodity Rate."

	Delivery Rate Period	Commodity Rate Period
On-Peak	7am-11pm	7am-11pm*
Off-Peak	11pm-7am	11pm-7am
Super-Peak		2pm-6pm (June-August)**

*Excluding Super-Peak period

**Excluding weekends and holidays

Customers who elect the VTOU rate are placed on the rate for an initial one-year term, which continues month to month thereafter until canceled by the customer upon written notice to the Company. The VTOU rate is designed for the delivery and commodity portions of the customer bill, however, participating electric customers may choose to take supply from a retail access supplier in lieu of the VTOU commodity portion.

VTOU customers that receive supply service from a retail access supplier will receive the VTOU distribution delivery rate for their On-Peak and Off-Peak usage in the VTOU Delivery Rate Periods but their electric supply and corresponding supply charges will be provided by their retail access supplier. The electric supply provided by the retail access supplier will be provided in accordance with the Company's standard tariff retail access program and will not use the Commodity Rate Periods specified for the VTOU rate.

Additionally, if the customer received supply service from the Company during their initial one-year term on the VTOU rate, and provided a copy of their New York State Department of Motor Vehicles registration for a plug-in electric vehicle ("EV") at their Premise at the time they enrolled in the VTOU rate, they will be eligible for a one-time bill protection guarantee. The Company will perform a one-time comparison of 12 months of the customer's charges under the VTOU rate to what the customer would have paid under the standard tariff. If this comparison indicates the customer would have paid less on the standard tariff rate, the Company will credit the customer the difference in their next retail bill.

While the VTOU rate is available across the Company's service territory, its inclusion in the Project allows National Grid to test how enabling technology, such as AMF and associated energy insights and actionable information, influences the adoption of time-of-use rates.

National Grid will file a petition with the Commission to modify the VTOU rate for Project participants. Under the existing tariff provision, VTOU customers are required to pay an incremental customer charge of \$3.36 per month (for metering required for the VTOU rate). The petition will request a modification to the VTOU customer charge to eliminate the incremental customer charge to reflect the use of AMF technologies funded through the Project and that no additional metering costs will be passed on to Project participants that adopt the VTOU rate.

Key VTOU Schedule items:

VTOU rate effective date	December 1, 2016
Petition modifying VTOU for participants	To be filed by February 2017
Billing system modified for VTOU AMF billing	To be completed by March 2017
VTOU marketing	April-September 2017

DER Services

In addition to reducing peak load through energy insights, actionable information and price signals, National Grid seeks to animate the market by working with third-party DER providers and/or facilitating DER providers' services as part of the Project. DER products and services will be opt-in offerings to customers, publicized via the customer engagement channels outlined above as well as community outreach. DER services may include energy efficiency, demand response, or renewable distributed generation opportunities.

DER providers will gain value by leveraging National Grid's communications channels to those customers opting in to receive such communications, and in turn, DER providers will contribute toward Project revenues in the form of referral incentive fees.

Direct Load Control ("DLC")

The National Grid Connected Solutions DLC program was launched across the National Grid service territory in 2016. The DLC program works with qualified smart appliances, including thermostats and water heaters, and aims to automatically reduce peak electric usage.

Customers that enroll in the DLC program will receive \$30 in the first year and an additional \$20 at the end of each following year as long as they participate in at least 80% of called events. Participants who opt in to the program will be notified when demand response events are scheduled to reduce overall demand during peak, critical hours of the electric summer capability period.

Participating customers will give National Grid the right to control their electric load during peak times (e.g., automatically changing thermostat settings by 2 degrees during an event). Participating customers will receive electronic event notifications as well as emails. Customers will be able to opt out of any specific event.

National Grid will track enrollment rates resulting from Project-specific promotions of the DLC program within Clifton Park and report results annually.

Insulation and Air Sealing

DER providers will offer home energy assessments and energy efficiency retrofit services in Clifton Park to customers that have expressly opted in to receive such marketing.

Additional DER Products and Services

Based on Town and Project participants' feedback, National Grid will provide additional DER product and service opportunities to residents in Clifton Park that have expressly opted in to receive marketing materials such as an EV adoption campaign, and other distributed generation opportunities such as solar photovoltaic ("PV") technology.

CCA Support

National Grid has engaged with Clifton Park officials and community members on the potential for CCA. As directed in Staff's Assessment Report of the Project, community-level supply procurement activities would follow the framework outlined in the Commission's CCA proceeding.¹³ Should the Town decide to move forward with CCA, National Grid will support the Town's efforts to identify opportunities where the Project and CCA could bring value to the Clifton Park community.

Potential areas of synergies between the Project and CCA may include:

- Opportunities to use the Project engagement and outreach platform to help inform Clifton Park customers of the Town's CCA actions and how CCA would interact with different Project elements;
- Opportunities for a selected energy supplier to partner in PTR though funding of rewards and ability to call PTR events based on day-ahead market prices, and/or
- Providing a platform to promote the selected retail supply provider's DER opportunities.

Project Opt-In / Opt-Out Summary

Table 6: Project Component Overview

	OPT IN	OPT OUT
Infrastructure		
AMF		X
VVO	<i>Distribution System Level</i>	
Communications		
Customer Outreach and Engagement		X
Deep Energy Insights and Actionable Information		X
Price Signals		
PTR		X*
VTOU	X	
DER Products and Services		
Energy Efficiency	X	
DLC	X	
Other DER (e.g., EV, solar PV)	X	
CCA		
CCA Coordinated by Town		X**

* All customers with AMF will be included in PTR notifications on an opt-out basis. To receive PTR rewards, customers will need to enroll (opt in) and accept the PTR reward provider's terms and conditions.

** CCA opt out will be implemented in accordance with the Commission's requirements for a municipally-sponsored CCA.

¹³ Case 14-M-0224 – *Proceeding on Motion of the Commission to Enable Community Choice Aggregation Programs*. Order Authorizing Framework for Community Choice Aggregation Opt-Out Program (issued April 21, 2016).

TEST STATEMENTS

National Grid and its partners will test the validity of the hypotheses shown in Table 7, Test Statements, below. The results of hypothesis testing will be tracked and documented and then used to inform and modify subsequent offerings to Clifton Park residential customers.

Table 7: Test Statements

Test Statement...	If...	Then...
1. <i>Infrastructure:</i> Infrastructure investments will bring benefits to customers.	A. National Grid builds out the required infrastructure and offers AMF to Clifton Park residents...	Clifton Park residents will accept the technology and receive deep energy insights.
	B. VVO is installed in Clifton Park...	All Clifton Park customers will see a reduction in electric consumption as a result of distribution system efficiencies.
2. <i>Customer Engagement:</i> Timely, customized communications and information will enable Clifton Park residents to make electric and gas energy choices that align with REV principles.	A. National Grid and its partners deliver customized and actionable information to Clifton Park residents using channels preferred by customers...	Clifton Park residents will make informed and engaged energy choices resulting in greater satisfaction with their electric and gas energy providers.
3. <i>Price Signals:</i> Price signals can result in Clifton Park residents acting to reduce local and system peak electric loads.	A. Clifton Park residents have the opportunity to participate in a PTR program ...	Clifton Park residents will be willing to reduce their electric energy usage resulting in points and rewards.
	B. Clifton Park residents targeted for increased electric rate education ...	Clifton Park residents will be more likely to adopt the electric VTOU rate.

<p><i>4. DER Services (Business Models and Revenue Streams):</i></p> <p>Informing customers about DER products and services will increase the adoption of DER and create new revenue streams for National Grid.</p>	<p>A. National Grid provides Clifton Park residents with information about specific value-added DER products and services from select partners...</p>	<p>Clifton Park customers will be more likely to adopt such DER products and services.</p>
	<p>B. If National Grid provides opportunities for select DER providers to educate Clifton Park residents who opt in to receive such products and services marketing ...</p>	<p>These partners will share a portion of their incremental revenue with National Grid.</p>
<p><i>5. Community Supply Procurement:</i></p> <p>Utilities can add value to the CCA process.</p>	<p>A. Clifton Park pursues CCA... ..</p>	<p>National Grid will use Project-specific outreach and education channels to support the Clifton Park CCA.</p>

TEST POPULATION

The Town of Clifton Park represents a growing suburban region with increasing energy usage and is well positioned to adopt advanced energy options that will benefit residents. The Project will target the approximately 14,400 National Grid residential electric customers in the Town of Clifton Park. Approximately 86% of these accounts are also National Grid residential natural gas customers.

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).¹⁴

¹⁴ <http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>

TEST SCENARIOS

See Table 8, Test Scenarios, below, for all Project test scenarios and metrics.

Table 8: Test Scenarios

Scenario	Description
Infrastructure	
AMF:	<p>Approximately 14,400 residential electric accounts in the Town of Clifton Park will be targeted for AMF installation on an opt-out basis.</p> <p>National Grid will test the deployment of AMF meters on an opt-out basis.</p> <p>Customers that do not opt out of AMF installation will have access to interval data on the customer portal and to deep energy insights.</p>
VVO:	<p>VVO will be deployed at two substations for the electric distribution system that combined serve about 90% of Clifton Park accounts. VVO is expected to be fully operational by December 2017.</p> <p>VVO performance will be verified through the VVO measurement and verification (“M&V”) report. M&V activities include measuring system performance by turning the system on and off, and measuring voltages and loads.</p>
Customer Outreach and Engagement / Deep Energy Insights and Actionable Information	
Energy Information and Engagement	<p>National Grid will test customer engagement in response to energy information by examining customer awareness, interest, comfort, knowledge, and satisfaction with Project offerings through customer surveys. National Grid will seek to understand the role specific engagement campaign events have on VTOU and DER adoption rates.</p> <p>National Grid will use a variety of communications channels to educate customers about the Project and its offerings.</p> <p>National Grid will implement customer surveys approximately every six months to determine customer levels of awareness and understanding of Project offerings.</p>

	<p>The Customer Energy Portal is designed to leverage AMF data capabilities combined with energy education to enable customers to better understand and better manage their energy use.</p> <p>National Grid will determine overall differences in pre- and post-energy consumption of Project participants, and attempt to attribute savings across Project elements (<i>e.g.</i>, outreach, insights, PTR participation, VTOU adoption, DER adoption, etc.). Electricity and gas savings will be analyzed separately.</p>
Price Signals	
Peak Load Reduction Test:	<p>National Grid will test PTR event participation rates defined by the delta between expected and actual electric load as measured by AMF data. National Grid will track the number of customers participating in PTR events and their average load reduction, along with aggregate community load reduction during events. National Grid will track enrollment in Points and Rewards and reward earnings rates.</p> <p>All Clifton Park residential customers who do not opt out of AMF installation will be targeted for participation in PTR. Customers with AMF that enroll in Points and Rewards will be eligible to earn rewards for curtailing electric load at specified times.</p> <p>National Grid will also identify when PTR events overlap with DLC program events and examine the impact DLC program participation may have on overall curtailment of customers that participate in both programs.</p>
VTOU Rate:	<p>National Grid will compare the VTOU adoption rate in Clifton Park with that in the rest of the Company's service territory to test the impact of enabling technology and targeted communications on rate adoption. If TOU analysis tools are deployed, National Grid will examine their influence on adoption of VTOU.</p>
DER	
Customer adoption of DER products and services	<p>National Grid will test the impact of targeted communications and education on the adoption rate of DER products and services (<i>e.g.</i>, home assessments, insulation and air sealing, DLC, energy efficiency, etc.).</p> <p>Currently identified DER services include:</p>

	<ul style="list-style-type: none"> • Insulation and air sealing, and home energy assessments • DLC, and • National Grid ETIP Portfolio. <p>Future DER opportunities may include EVs, solar PV, and other offerings.</p> <p>National Grid will also monitor enrollment in the DLC program within Clifton Park and compare that to the existing benchmark of 7%.¹⁵</p>
Development of new revenue streams for National Grid	National Grid will test the ability of the Company to earn revenues from generation of leads to DER providers.
CCA	
Town adoption of CCA	Should the Town decide to pursue CCA, National Grid will use demonstration-specific communication channels to help educate and inform customers about CCA and Town-specific CCA activities. These communications channels include the demonstration website, banner ads in the customer portal, HERs, and demonstration related mailings.

MILESTONES AND CHECKPOINTS

As the Implementation Plan is an evolving, working document, refinements to scope of work for Project partners and internal National Grid teams are expected as the Project progresses. Modifications will be captured in quarterly reports and meetings with Staff.

Milestones:

There are several points in the Project that will serve as critical milestones including:

- | | |
|--|-------------------------|
| • <i>First Article Meters Delivered to National Grid</i> | <i>January 2017</i> |
| • <i>Verizon Connectivity to Support First Article Testing</i> | <i>January 2017</i> |
| • <i>Meter First Article Approved</i> | <i>January 2017</i> |
| • <i>Phase 1 User Acceptance Testing Complete</i> | <i>February 2017</i> |
| • <i>CCA Decision by Town</i> | <i>1st quarter 2017</i> |

¹⁵ Adoption rate is based on comparable adoption rate for National Grid DLC “Cool Kenmore” program.

- *Phase 1 Go-live Declared*
- *Completion of AMF Installation Expected*

March 2017
May 2017

Check Points:

Check Point	Description
Infrastructure	
AMF Opt Out:	<p>National Grid will monitor ongoing customer opt-out rates of AMF meters. <u>Measure:</u> Customer opt-out rate of AMF meters. <u>How and When:</u> Meter opt-out rate will be assessed upon initial 30 day opt-out period, and during Project deployment. <u>Resources:</u> National Grid billing system and call center statistic tracking. <u>Expected Target:</u> Opt-out rate not to exceed 10%. <u>Solution / Strategies in case of results below expectation:</u> If the opt-out rate is greater than 10%, National Grid will obtain customer feedback through surveys to determine why and update the marketing strategy accordingly.</p>
VVO System Benefits:	<p><u>Measure:</u> System level electric energy and demand reduction. <u>How and When:</u> VVO M&V will be conducted at the end of the Project and will include intermittent field testing and a VVO M&V report. <u>Resources:</u> Utilidata, National Grid Advanced Engineering Team <u>Expected Target:</u></p> <ul style="list-style-type: none"> • Save over 5.99 million kWh annually • Reduce demand by over 1.98 MW • Avoid over 4,216 metric tons of carbon dioxide emissions¹⁶ <p><u>Solution / Strategies in case of results below expectation:</u> If the M&V Report shows significantly different results than anticipated, National Grid will engage the VVO partner for further examination of performance assumptions against results.</p>
Customer Outreach and Engagement / Deep Energy Insights and Actionable Information	
Customer Outreach and Engagement and Deep Energy Insights and Actionable Information	<p><u>Measure:</u> Customer satisfaction with Project and Project-specific components such as outreach and education, customer portal and deep energy insights, electric savings (kWh, KW) and gas (dth) savings. <u>How and When:</u> Annual customer surveys will gather quantitative and qualitative insight to customers' experience with the Project. A baseline survey was performed in October 2016. A pre-/post-billing analysis will be performed after the Project is completed and there is sufficient consumption data available to do so.</p>

¹⁶ Figure calculated using EPA generic conversion: 7.03×10^{-4} (eGRID, U.S. annual non-baseload CO₂ output emission rate, year 2012 data).

	<p>Resources: National Grid Customer Insights Team</p> <p>Expected Target:</p> <ul style="list-style-type: none"> Expected increase in customer satisfaction of 2%, with stretch of 5%. 5% reduction in electricity and gas usage. <p>Solution / Strategies in case of results below expectation: Revisit engagement approaches based on survey results and customer inputs. If survey results demonstrate lack of awareness or understanding of Project offerings, outreach and engagement tools will be revisited to re-focus communications efforts.</p>
Customer Energy Portal Engagement	<p>Measure: Determine customer portal engagement levels.</p> <p>How and When: Tracked monthly throughout Project.</p> <p>Resources: Engagement vendor</p> <p>Expected Target:</p> <ul style="list-style-type: none"> Number of customer portal users Login rates (total by month) Web logins (all transactions by customers) Top 5 visited site selections (by calendar month) Customer enrollment in Points and Rewards campaign Cumulative customer Points and Rewards events Points and Rewards redemption. <p>Solution / Strategies in case of results below expectation: National Grid and its partner will analyze portal metrics on a regular basis to identify if outreach efforts need to be redirected to increase online engagement.</p>
Price Signals	
Peak Time Rewards:	<p>Measure: Measure customer participation and load reduction across PTR events.</p> <p>How and When: After each event and end of capability period.</p> <p>Resources: National Grid Advanced Data Analytics and Meter Data Services</p> <p>Expected Target:</p> <ul style="list-style-type: none"> 40-50% participation rate per event 0.50 kW average electric reduction per customer per event <p>Solution / Strategies in case of results below expectation: If PTR participation rates are lower than expected, the communication strategies and reward structure will be revisited.</p>
VTOU Rate:	<p>Measure: Customer rate adoption and load shift.</p> <p>How and When: Throughout Project.</p> <p>Resources: National Grid Advanced Data Analytics Team and /or evaluation contractor</p> <p>Expected Target:</p> <ul style="list-style-type: none"> Benchmark of 6-38% adoption, with target of 24% adoption for VTOU rates. A proxy for expected load shift is under development. <p>Solution / Strategies in case of results below expectation: If VTOU adoption rates are lower than anticipated, communications strategies will be revisited.</p>

DER	
DER Opportunities:	<p><u>Measure:</u> Customer adoption of DER products and services introduced through Project.</p> <p><u>How and When:</u> Over project life.</p> <p><u>Resources:</u> DER providers, National Grid Procurement Team</p> <p><u>Expected Target:</u> Adoption rate specific to each DER provider. Expected DER adoption rates will be developed for individual DER offerings as they are included in the Project.</p> <p><u>Solution / Strategies in case of results below expectation:</u> Revisit DER engagement strategy.</p>
DER Related Revenue Streams	<p><u>Measure:</u> How many DER providers willing to share DER revenues.</p> <p><u>How and When:</u> Over Project life.</p> <p><u>Resources:</u> DER product and service providers, National Grid Procurement</p> <p><u>Expected Target:</u> Potential revenues from DER providers will be determined based on individual DER offerings and providers, and National Grid's ability to provide leads within customer data sharing regulations.</p> <p><u>Solution / Strategies in case of results below expectation:</u> Recruit additional DER providers based on customer interest solicited through customer surveys. Revisit revenue stream structure.</p>
CCA	
CCA Test	<p><u>Measure:</u> If the Town pursues CCA, National Grid will use Project-specific outreach and education channels to support customer engagement in CCA. These channels include Project-specific web, customer portal banner space, HERs, and Project-specific mailings.</p> <p><u>How and When:</u> At CCA initiation and during CCA opt-out period, using Project channels.</p> <p><u>Resources:</u> Town leadership and National Grid.</p> <p><u>Expected Target:</u> Three of four Project outreach channels.</p> <p><u>Solution / Strategies in case of results below expectation:</u> If the Town CCA opt-out rate is higher than the Town expects, National Grid will work with the Town to supplement their outreach efforts.</p>

Conditions and Barriers

Consumer Protections

Residential customers participating in the Project will continue to be protected under the Home Energy Fair Practices Act (“HEFPA”) which includes provisions addressing termination of service for non-payment, offers of deferred payment agreements to customers in arrears, and a host of other consumer protections.

Staff's Assessment report addressed the sharing of customer data with third parties. National Grid will limit sharing of customer data in accordance with Company policy¹⁷ and the proposed "Aggregated Data Privacy Policy Statement of National Grid" filed with the Commission on November 1, 2016 in accordance with the Track Two Order.¹⁸ Based on Staff's direction, National Grid will not be required to seek a waiver for sharing confidential customer data with Project partners working on behalf of the Company to provide analytics associated with the Project.

Channel or Market Challenges

This Project is designed to bring a multitude of options and solutions to residents of Clifton Park to reduce participants' demand. National Grid is moving forward in a purposeful manner so as to not overwhelm customers with information and communications. Monitoring the tone and frequency of communications, while also making them relevant and actionable, should help to minimize the number of customers choosing to opt out. National Grid intends to monitor the opt-out rate closely to ensure that key information such as usage alerts, price signals, and opportunities to earn rewards continue to be accessible to the majority of participants.

PROJECT STRUCTURE AND GOVERNANCE

Project Team

Executive Sponsorship

National Grid has assigned an executive sponsor for each of its REV Demonstration Projects, recognizing that active sponsorship is a critical success factor for successful project management. Executive sponsor responsibilities include:

- Accountability for the ultimate success of the project;
- Vision and leadership throughout the project;
- Time commitment and active engagement throughout the project, and
- Addresses conflicts and ensures senior stakeholders are engaged and supportive.

Core Project Team

- Philip Austen, Director Solutions Delivery - Executive Sponsor
(Tel.: 516-545-4753/ Email: pausten@nationalgrid.com)
- Melissa Piper, Solutions Delivery - Project Manager
(Tel.: 315-428-5002/ Email: Melissa.Piper@nationalgrid.com)
- Ara Tadevossian, Information Solutions – Project Manager
(Tel.: 315-428-6695/ Email: Ara.Tadevossian@nationalgrid.com)

¹⁷ National Grid Group Information Security Management, Data Privacy Policy, Global Information Security Policy, Issue 2.4.

¹⁸ REV Proceeding, *supra* note 3, p. 157.

- John Spring, Partnerships and Joint Ventures
- (Tel.: 781-907-3694/ Email: John.Spring@nationalgrid.com)
- Paul Wassink, Customer Solutions
- (Tel.: 781-907-2681/ Email: Paul.Wassink@nationalgrid.com)
- Kara Fedors, Solutions Delivery
- (Tel.: 781-907-2244/ Email: Kara.Fedors@nationalgrid.com)

Internal Stakeholders

There are various departments within National Grid that are critical to the delivery of this Project. They include:

- Bill Project Management and Services
- Communications and Marketing
- Community and Customer Management
- I/S Relationship Network Strategy
- Legal and Regulatory
- Load Research and Analysis
- Meter Data Services
- Electric Pricing
- Strategic Communications
- Advanced Data and Analytics

Roles and Responsibilities

See Table 11, Roles and Responsibilities, below, for key Project responsibilities. Note that the roles and responsibilities in this document focus on the Project, and do not fully detail related activities.

Table 11: Roles and Responsibilities

National Grid Role / Responsibility	Description
Support conceptual design and lead detailed program implementation	Provide necessary data, and expertise for the Project design work
Engage community stakeholders	Gather qualitative data and interview stakeholders regarding expectations for various parts of the Project
Deploy advanced infrastructure	Work with stakeholders to obtain necessary approvals and implement infrastructure deployment
Manage and coordinate vendors and partners	Manage and coordinate third parties implementing various aspects of the Project
Deploy VTOU rate	Provide customers with educational information surrounding the VTOU rate
Secure waiver from VTOU tariff by filing a petition for Commission approval	Prepare and file petition for tariff waiver
Town of Clifton Park Role / Responsibility	Description
Feedback on Project plan	Evaluate National Grid Project plan
Represent residential community at-large	Represent residential constituency and serve as customer advocate for various Project components
Evaluate feasibility of pursuing a CCA	Decide if a CCA model is beneficial to the Town

Department of Public Service Staff, Public Service Commission Role / Responsibility	Description
Provide feedback on quarterly reports for Project	Review progress against Project objectives and recommend any corrective actions
Approve National Grid infrastructure proposals	Review infrastructure proposals and provide necessary approvals following appropriate review and oversight
Provide feedback to National Grid on rate plans	Review and provide recommendations on alternative rate plans that are aligned with PSC goals and provide customer value
Act on National Grid's petition for VTOU tariff waiver	Approve tariff waiver

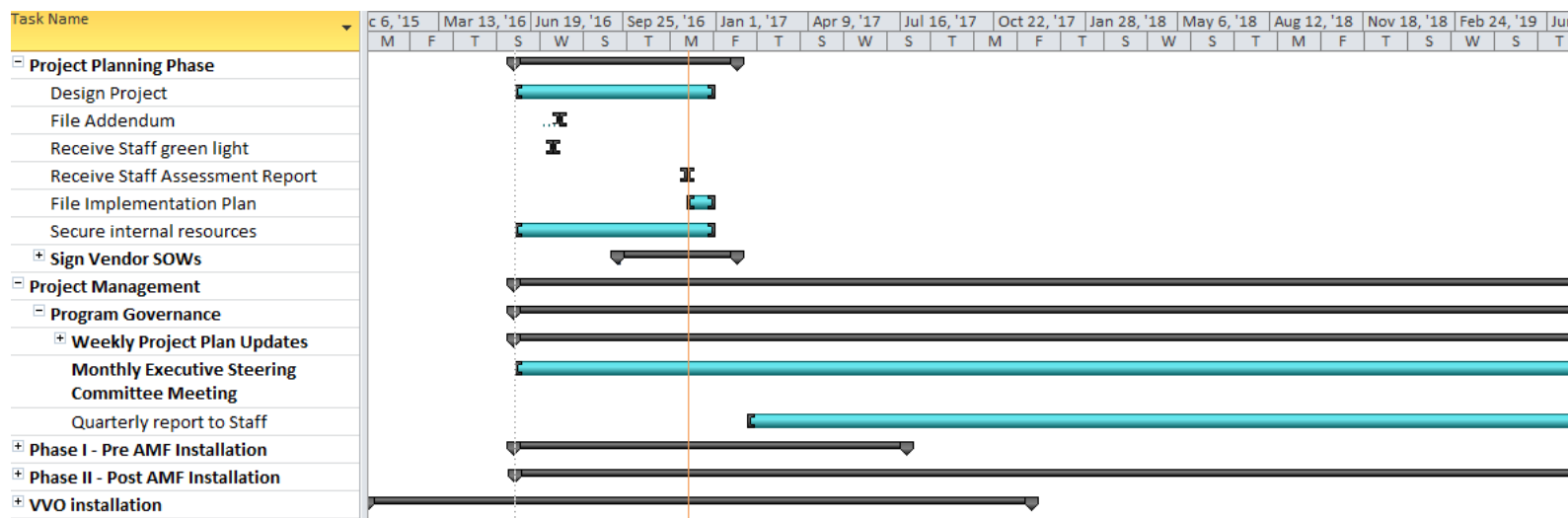
Governance

Project governance will include the Core Project Team (as set forth above) and will consist of monthly conference calls and in-person meetings at milestone points to report on Project schedule, identified risks, Project status, and the projected costs and benefits of services under development.

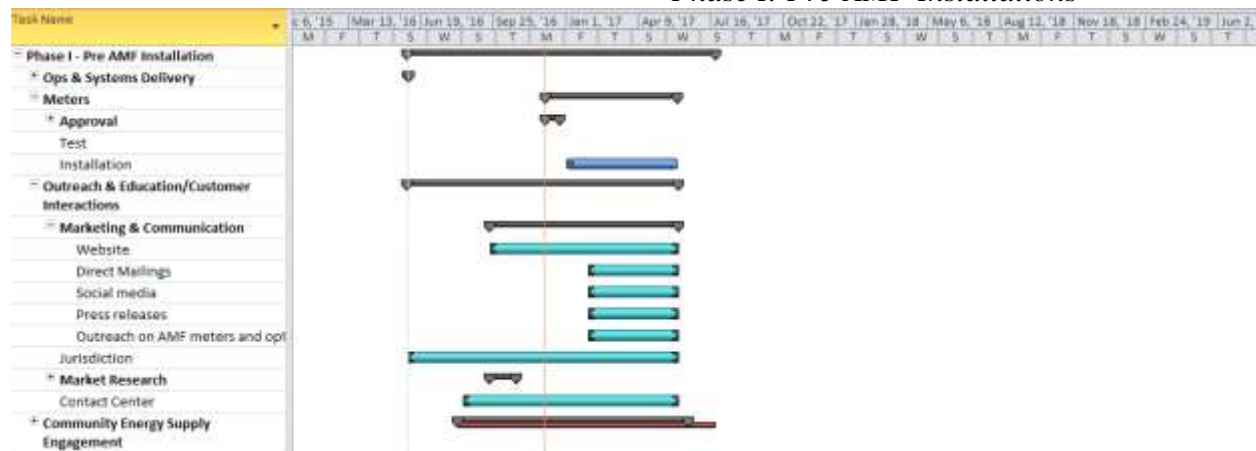
WORK PLAN

See Figure 16, Project Timeline and Milestones, below, for an overview of the Project work plan.

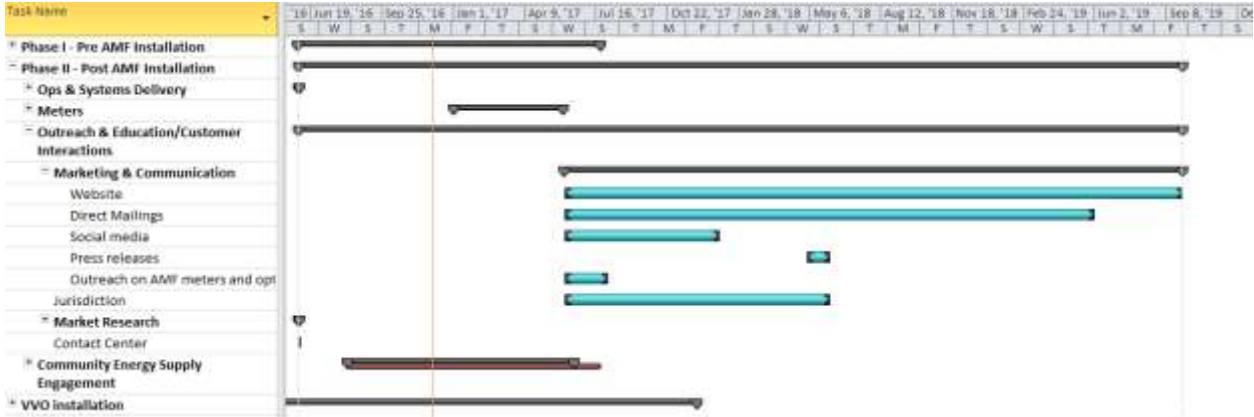
Figure 16: High Level Project Plan



Phase I: Pre-AMF Installations



Phase II: Post-AMF Installations



PROJECT BUDGET

Summarized below in Table 13 is the Preliminary Budget with estimated costs for the first three years of the Project.

Table 13: Three-Year Preliminary Budget

Expense Type	Year 1	Year 2	Year 3
Capital	\$9,059,785	\$1,393,391	\$0
O&M	\$7,515,597	\$4,628,086	\$4,222,477
Total	\$16,575,382	\$6,021,477	\$4,222,477

National Grid has held discussions to determine levels of interest in a revenue-sharing model for lead generation for DER services. National Grid will continue to work with Staff to determine the potential for a revenue-sharing model for DER services adopted by residents, recognizing that express consent from customers is necessary in order to market potential leads to DER service providers.

National Grid will only share data with partners or vendors if the act of sharing the data complies with Company policy and New York State rules and regulations governing the sharing of confidential personal information, unless the customer provides express consent to share such information.

REPORTING STRUCTURE

Quarterly progress reports will be provided to Staff. These reports will include an overview of project progress against timeline/plan and results as they become available. The quarterly report template is provided below in Figure 17, Quarterly Report Template, and will continue to be refined as the Project progresses.

Figure 17: Quarterly Report Template

<p>QUARTERLY REPORTING TEMPLATE</p> <p>Milestones Last Project Milestone: Next Project Milestone:</p> <p>Tasks/Timeline Completed Project Tasks Since Last Report: Changes or Impacts to Schedule since Last Report: Lessons Learned: Work Stream Coordination:</p> <p>Risks Identified Risks: Risk Mitigation Plan:</p> <p>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):</p> <p>Additional Notes:</p>

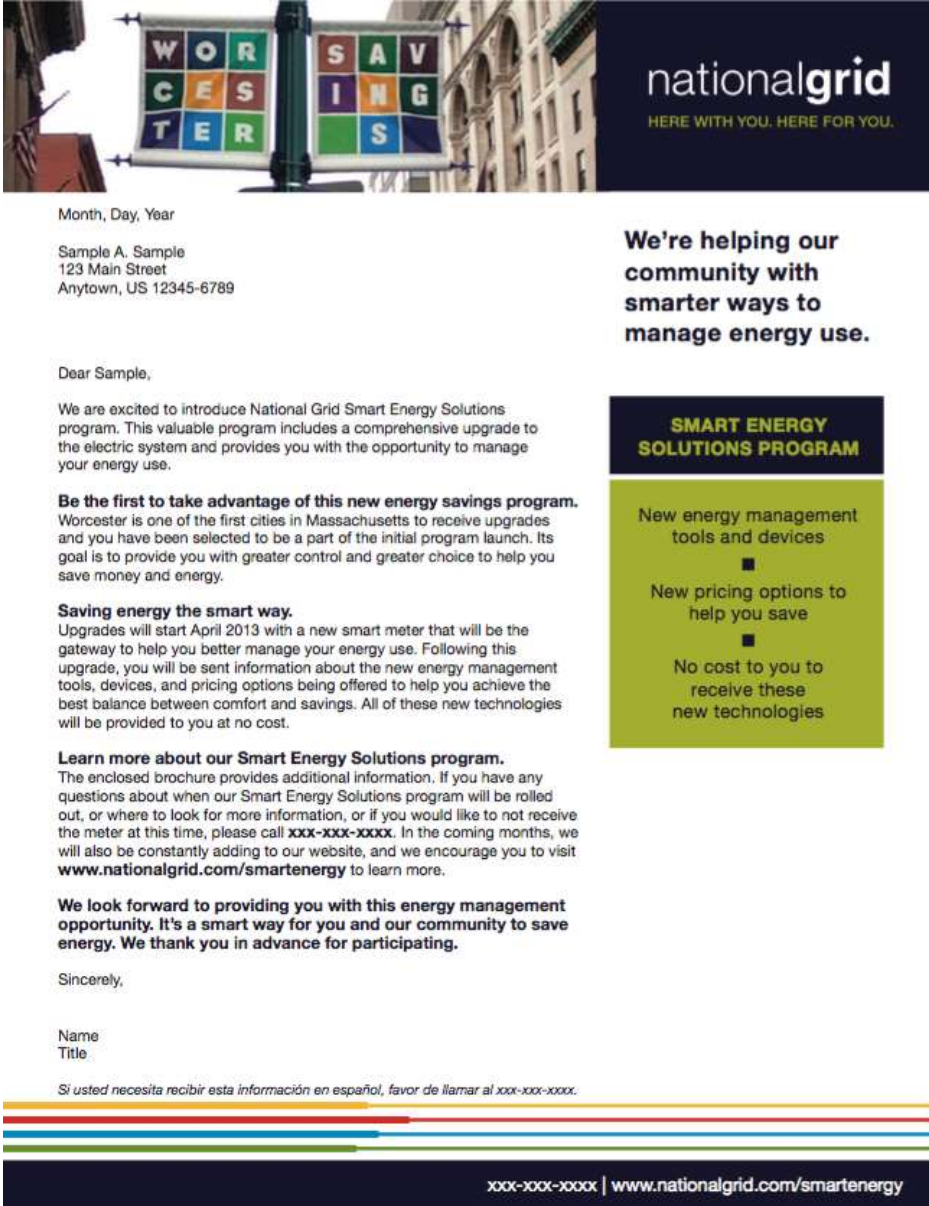
Appendix A – REV Alignment

REV Objective	Demonstration Alignment
Enhance customer knowledge and tools that will support effective management of the total energy bill	The Project leverages the capabilities of interval metering technologies on cellular networks to generate near real-time information on customers' electric and gas usage.
	This information will be shared via an interactive, customer-friendly portal as well as direct communications and alerts that educate and engage customers with actionable information that they can use to reduce their electric and gas energy use.
Market animation; leverage customer contributions	The Project animates the market by leveraging partnerships with DER providers in efforts to achieve wider deployment of DER.
	Additional energy industry-related services are animated by the Project, including technology and platform developers and providers delivering actionable information.
System wide efficiency	Through Peak Time Rewards, the Project tests the potential for mass-market participation in electric distribution system management opportunities.
	Participants in the Project will receive AMF meters and all customers in Clifton Park will benefit from VVO installation to further improve overall electric system efficiency.

System reliability and resiliency	The Project provides opportunities to manage the electric distribution system with aggregated mass-market demand-response and VVO.
Reduction of carbon emissions	The Project supports Clean Energy Standard goals of carbon emission reductions through reduced energy consumption.
Partnerships with third-party service providers	The Project has multiple, market-animating partnerships with DER, technology, and platform providers. It is designed to promote DER adoption.

Appendix B – Outreach and Engagement

Sample Smart Energy Introduction Letter to Customers



The image shows a sample letterhead for National Grid. At the top left is a graphic of a street sign that reads 'WORCESTER SAVING' in colorful letters. To the right is the National Grid logo with the tagline 'HERE WITH YOU. HERE FOR YOU.' Below the logo is a dark blue box with white text: 'We're helping our community with smarter ways to manage energy use.' To the right of this box is a green box with white text: 'SMART ENERGY SOLUTIONS PROGRAM'. Below this box is a list of benefits: 'New energy management tools and devices', 'New pricing options to help you save', and 'No cost to you to receive these new technologies'. The letter body is on the left, starting with a placeholder for the date, followed by a sample address. The letter text includes a greeting, an introduction to the Smart Energy Solutions program, a section titled 'Be the first to take advantage of this new energy savings program.' which mentions Worcester, Massachusetts, a section titled 'Saving energy the smart way.' which mentions an April 2013 upgrade, and a section titled 'Learn more about our Smart Energy Solutions program.' which mentions a brochure and a website. The letter ends with a closing, a signature line, and a footer with a Spanish translation of the header and the website URL.

Month, Day, Year

Sample A. Sample
123 Main Street
Anytown, US 12345-6789

Dear Sample,

We are excited to introduce National Grid Smart Energy Solutions program. This valuable program includes a comprehensive upgrade to the electric system and provides you with the opportunity to manage your energy use.

Be the first to take advantage of this new energy savings program.
Worcester is one of the first cities in Massachusetts to receive upgrades and you have been selected to be a part of the initial program launch. Its goal is to provide you with greater control and greater choice to help you save money and energy.

Saving energy the smart way.
Upgrades will start April 2013 with a new smart meter that will be the gateway to help you better manage your energy use. Following this upgrade, you will be sent information about the new energy management tools, devices, and pricing options being offered to help you achieve the best balance between comfort and savings. All of these new technologies will be provided to you at no cost.

Learn more about our Smart Energy Solutions program.
The enclosed brochure provides additional information. If you have any questions about when our Smart Energy Solutions program will be rolled out, or where to look for more information, or if you would like to not receive the meter at this time, please call xxx-xxx-xxxx. In the coming months, we will also be constantly adding to our website, and we encourage you to visit www.nationalgrid.com/smartenergy to learn more.

We look forward to providing you with this energy management opportunity. It's a smart way for you and our community to save energy. We thank you in advance for participating.

Sincerely,

Name
Title

Si usted necesita recibir esta información en español, favor de llamar al xxx-xxx-xxxx.

xxx-xxx-xxxx | www.nationalgrid.com/smartenergy

Sample Bill Insert from National Grid's Worcester Smart Grid Pilot



**maximize
your energy
savings**

nationalgrid
HERE WITH YOU. HERE FOR YOU.

Save energy and money with our Smart Energy Solutions!
www.nationalgrid.com/smartenergy



nationalgrid
HERE WITH YOU. HERE FOR YOU.

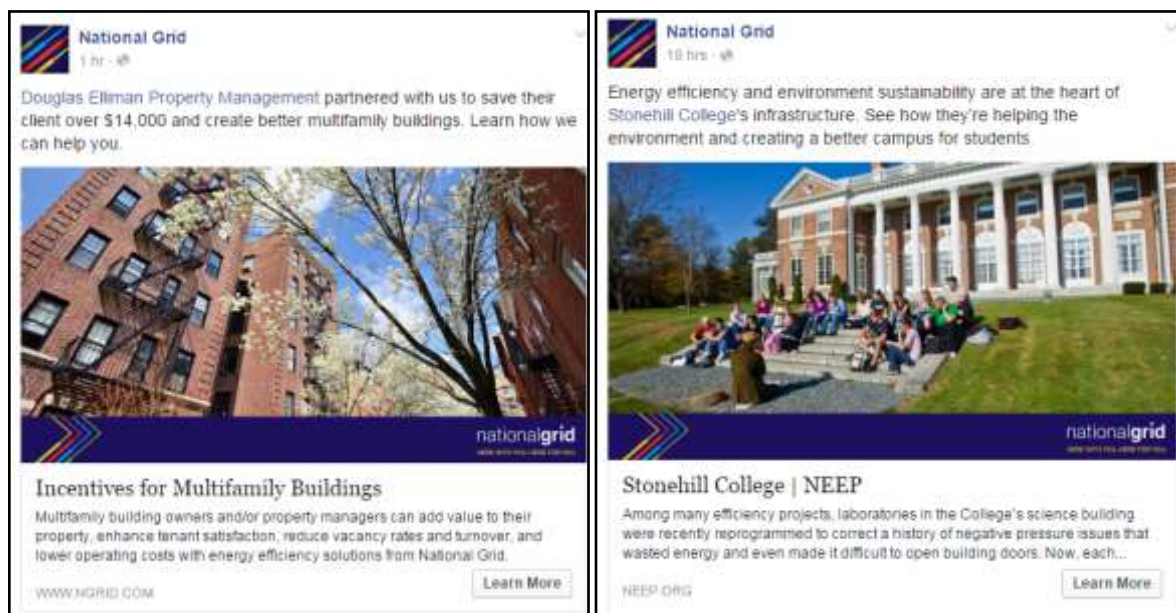
**New pricing plans
coming in June**

Choose a pricing plan that works for you! Now save even more through our Smart Energy Solutions Program.

Learn more at **www.nationalgrid.com/smartenergy**
or call **1-855-377-SMART (1-855-377-7627)**.

EE5707 (5/14)

Sample National Grid Social Media Messages





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

Hon. Kathleen H. Burgess, Secretary
National Grid: Community Resilience REV Demonstration Project
Implementation Plan Filing
March 11, 2016
Page 2

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 Enos, w/enclosure (via electronic mail)



**Implementation Plan for
Community Resilience REV Demonstration Project
Potsdam, New York**

March 11, 2016

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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 storms¹ 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.

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

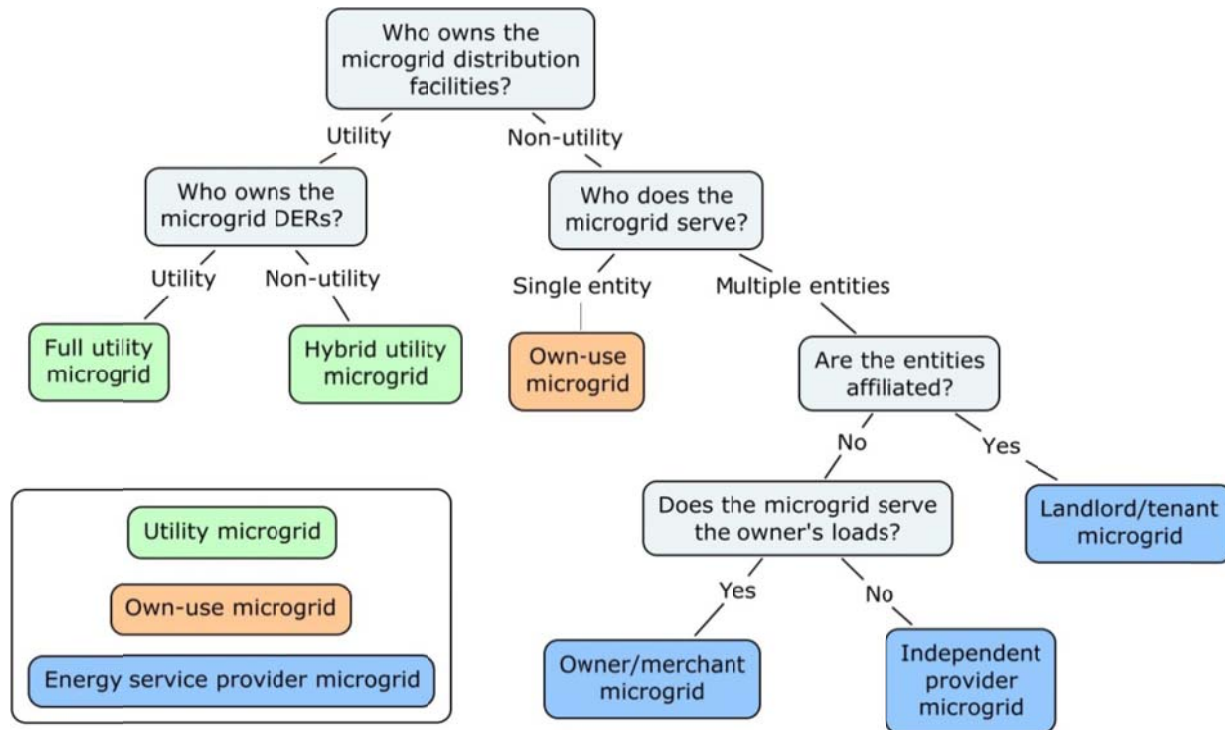
Services which are deemed a “Go” will be implemented after the REV demonstration project during the construction phase for the hybrid utility microgrid. A formal evaluation plan for assessing the effectiveness of the services during microgrid operation will be proposed in the quarterly report to the 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.

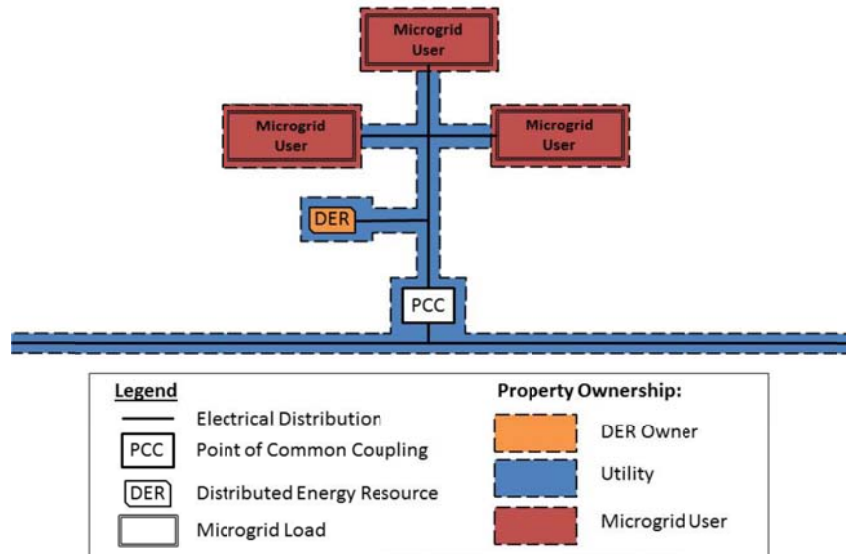
This hybrid utility microgrid model³ was chosen for the community resilience microgrid project in Potsdam using the following decision tree:⁴



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.

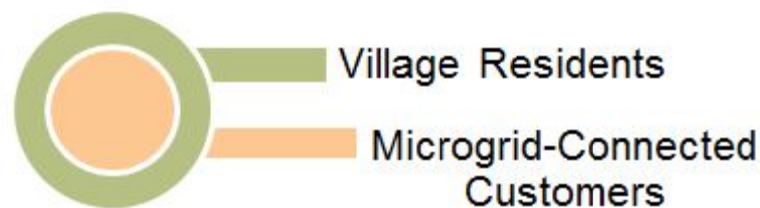
1. Tiered recovery for storm-hardened, underground wires

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.

Tiered Wires Recovery



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.

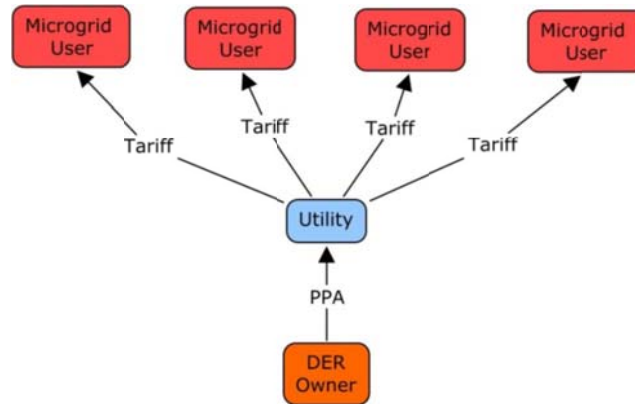
The recovery mechanism for this allocation of costs will be further developed through the REV demonstration project. A distribution surcharge, a revised or new standby rate, or other cost recovery mechanism will be proposed at the Preliminary Service Proposals & Pricing checkpoint and at the final Completion 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

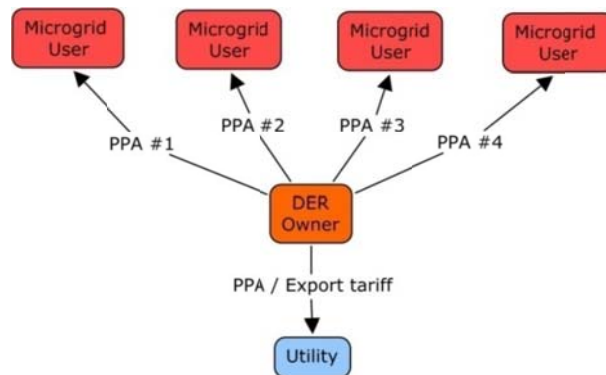
National Grid envisions that the DER required to successfully island the proposed microgrid in Potsdam will include both existing, and potentially new, customer-owned DER (i.e., DER that are sited on the customer's side of the utility meter). Microgrid-connected customers may independently adopt some 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

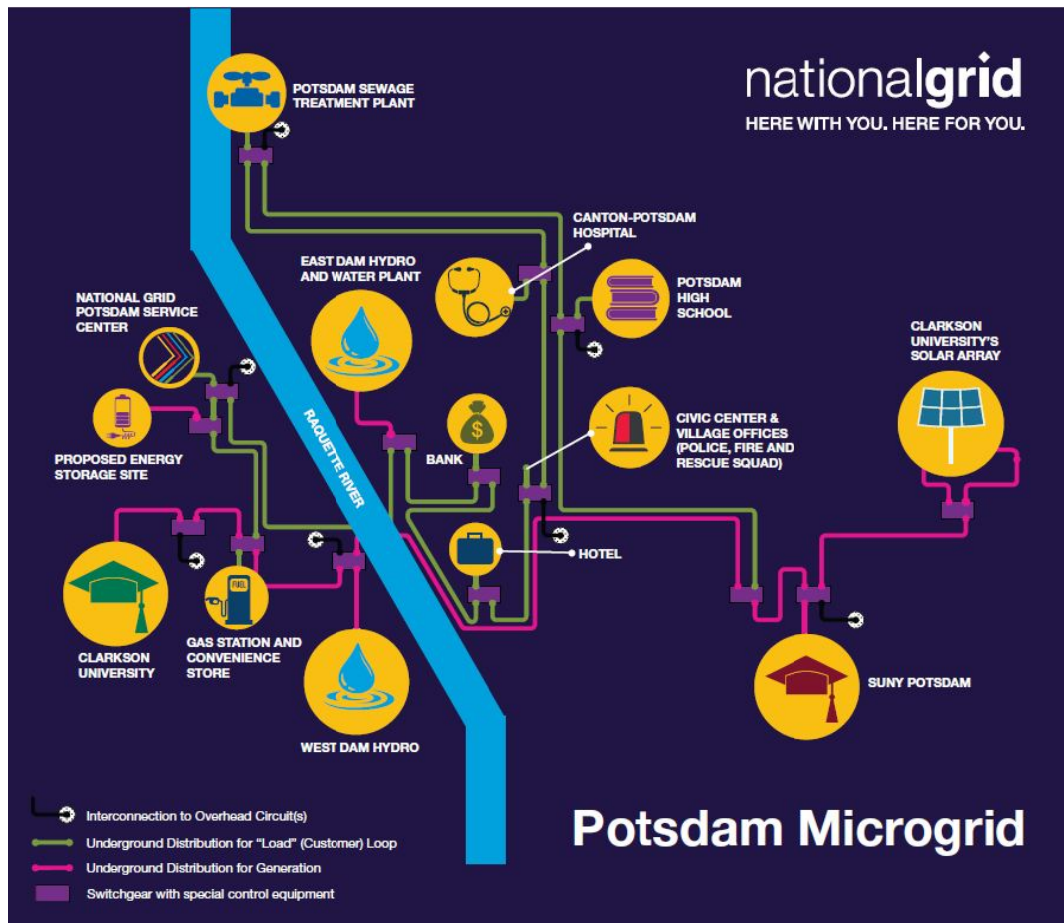
The compensation for existing customer-sited DER, as well as any new utility-sited DER, requires metering hardware for recording usage, a billing engine to calculate a customer's required payment, and a means to execute a bill and collect payment. While a third-party service provider could offer these 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...
<p><i>Proposed service 1:</i> A tiered cost allocation can recover a majority of incremental distribution infrastructure costs from prospective microgrid customers and beneficiaries</p>	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
<p><i>Proposed service 2:</i> A utility central procurement model for DER can enable the development of incremental, cost-effective capacity needed for a multi-customer microgrid</p>	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...
<p><i>Proposed service 3:</i> The utility is well-suited for the control and operations of a hybrid utility microgrid</p>	<p>National Grid offers microgrid control and operations service (maintaining frequency, voltage, and power quality) with an associated service fee</p>	<p>Prospective microgrid customers and stakeholders will select National Grid as the most qualified and cost-effective entity to provide this service</p>
<p><i>Proposed service 4:</i> Current utility capabilities offer the optimal solution for hybrid utility microgrid billing and financial transaction services</p>	<p>National Grid leverages existing utility services including metering, billing, credit and collections for microgrid customers, with an associated service fee</p>	<p>Prospective microgrid customers and stakeholders will select National Grid as the most qualified and cost-effective company to provide this service</p>

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

¹¹Internal 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:

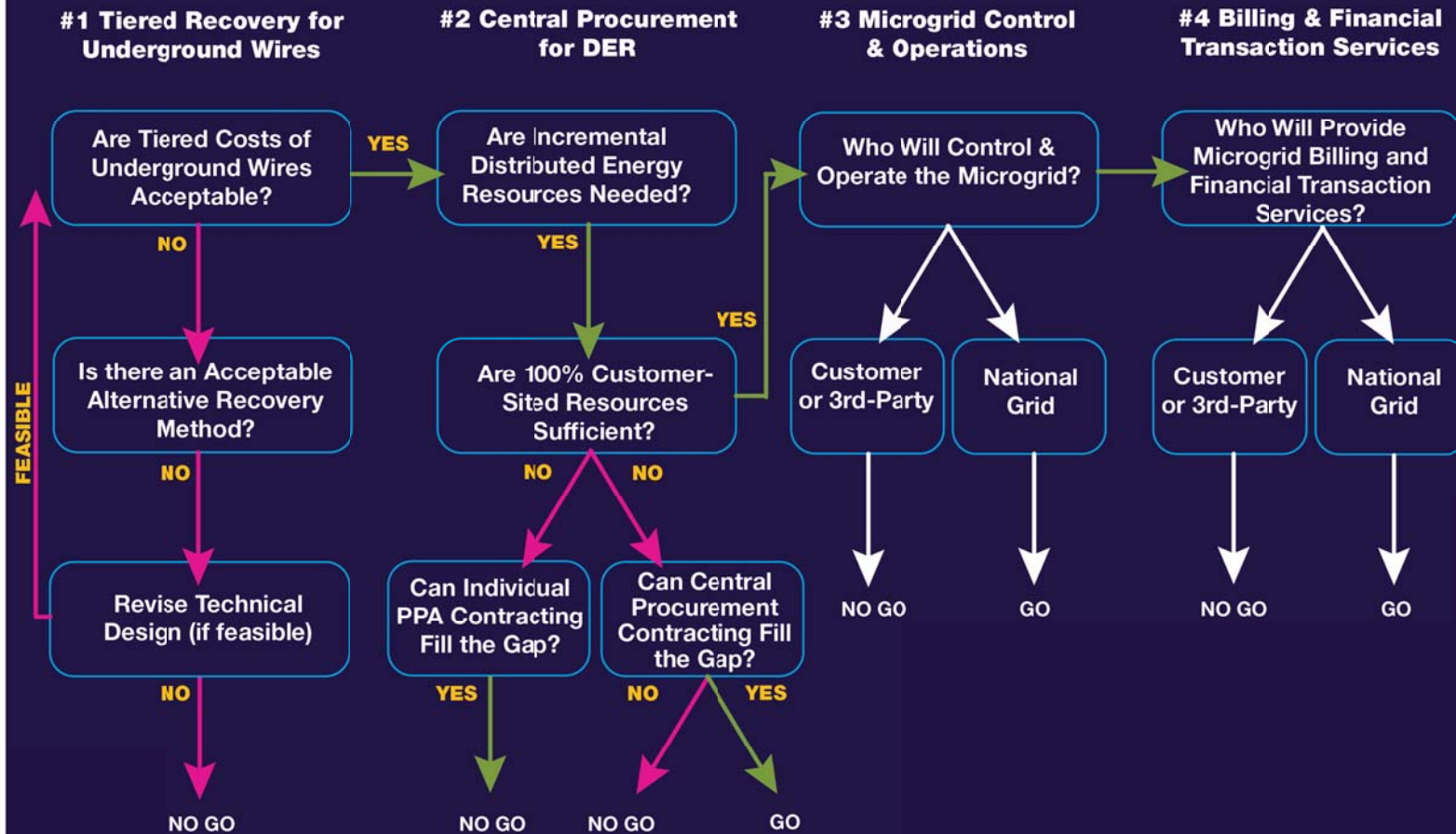
- 1) Tiered recovery for new storm-hardened, underground wires;
- 2) Central procurement for DER;
- 3) Microgrid control and operations; and
- 4) Billing and financial transaction services.

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.



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

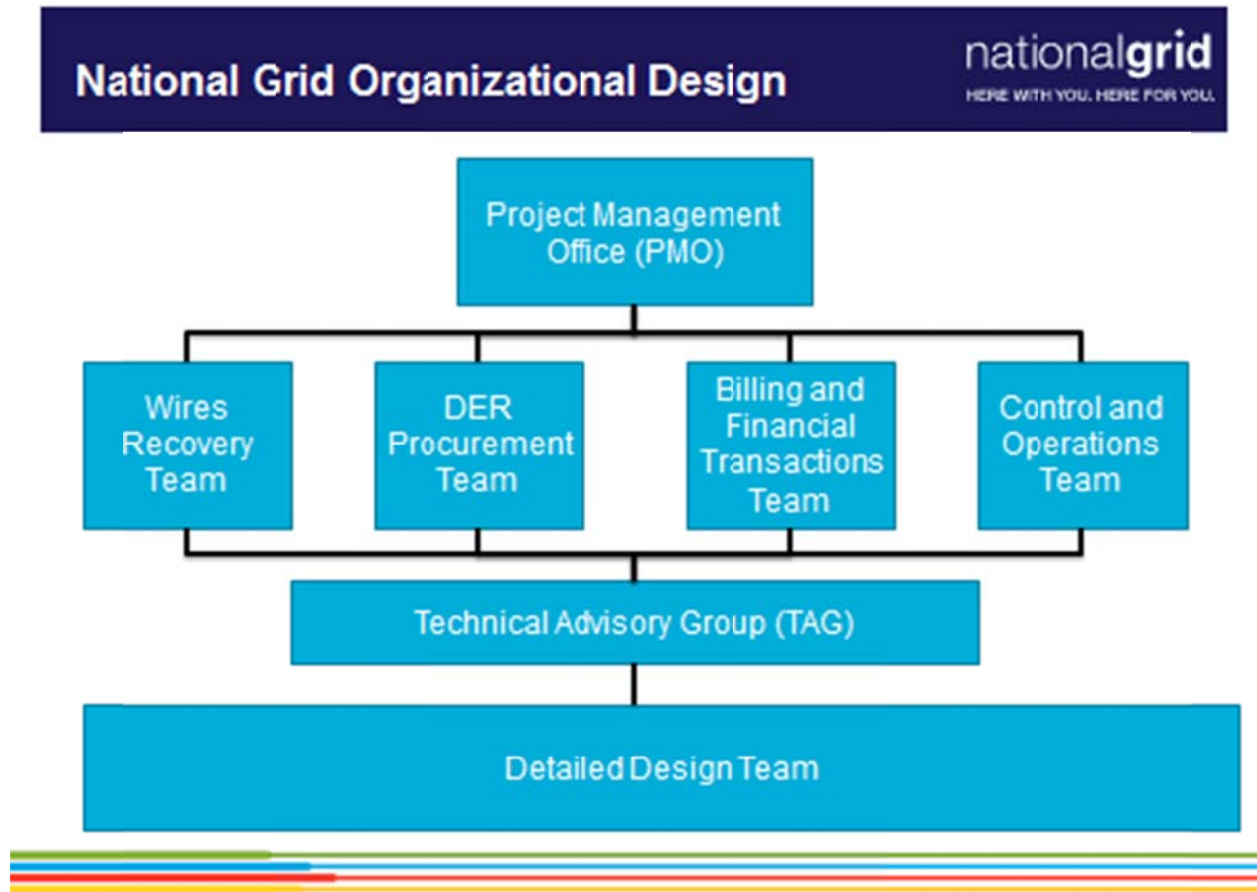
- Engineering
- Tariff Design
- Contracting
- Stakeholder engagement
- Communications, media relations, and marketing to larger community
- Government relations

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 Staff¹⁴

Thomas Ortmeyer, Conceptual Study Project Lead, Clarkson University	tortmeyer@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

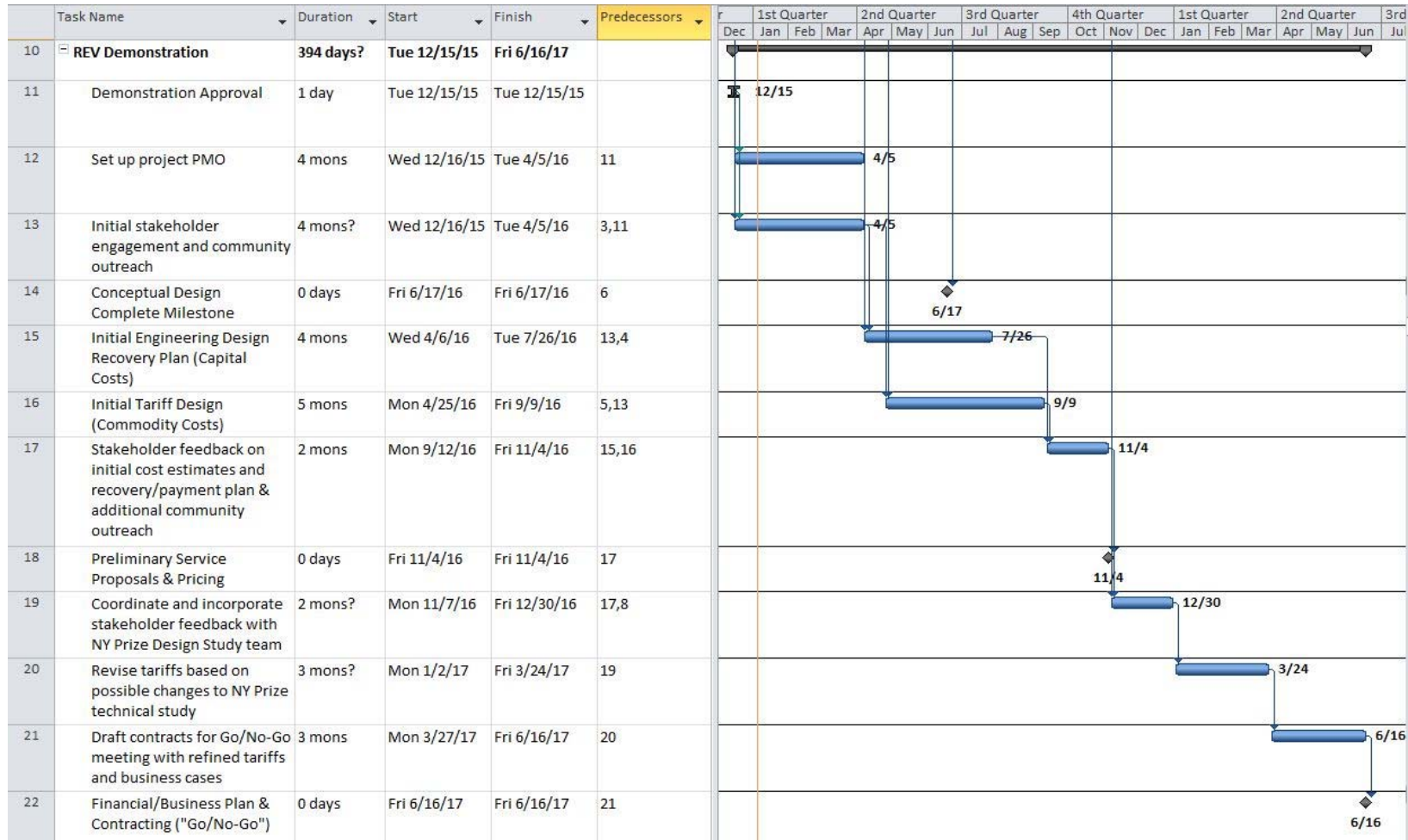
Governance

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 Plan¹⁵



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:

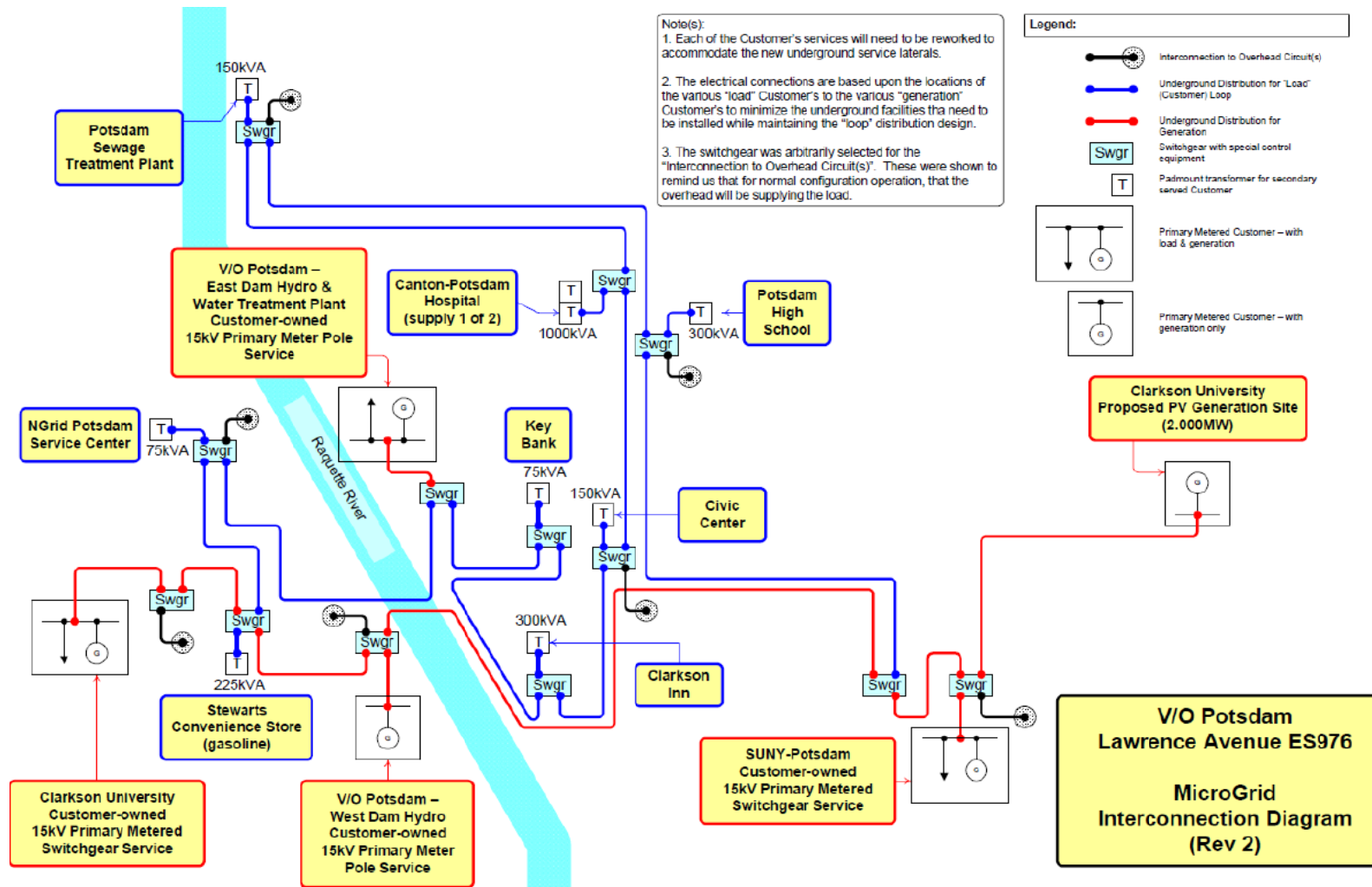
Incremental Spend Variance:

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.



Implementation Plan for Distributed System Platform REV Demonstration Project

Case 14-M-0101

**Niagara Mohawk Power Corporation d/b/a National Grid
8/15/2016**

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Executive Summary

The Reforming the Energy Vision (“REV”) Distributed System Platform (“DSP”) Demonstration Project (the “Project”) described herein was initially filed with the Public Service Commission (“Commission”) by Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid” or the “Company”) with the Buffalo Niagara Medical Campus Inc. (“BNMC”) as its customer partner on July 1, 2015. A revised Pscope for the Project was filed with the Commission on June 15, 2016. This Implementation Plan has been prepared in consultation with New York State Department of Public Service Staff (“Staff”) and in accordance with the REV Demonstration Project Assessment Report filed by Staff with the Commission on July 15, 2016 which requires the Implementation Plan to be filed by the Company no later than August 15, 2016.

The Project seeks to develop and test services based on a local, small-scale, but centralized Distributed System Platform (“DSP”) that will communicate with network-connected points of control (“POCs”) associated with BNMC distributed energy resources (“DERs”). DSP was defined in the Commission’s REV Track One Policy Order using the definition developed by the Platform Technology Working Group as “an intelligent network platform that will provide safe, reliable and efficient electric services by integrating diverse resources to meet customers’ and society’s evolving needs” where the “DSP fosters broad market activity that monetizes system and social values, by enabling active customer and third party engagement that is aligned with the wholesale market and bulk power system.”¹ The POC will take the form of an application hosted on a server at a customer’s site, with communications capabilities to control DER assets based on requested events on the electric power system (e.g., local generation to meet peak demand or voltage support needs) and the terms of contractual agreements in place with the local DSP provider.

The Project team consists of National Grid, BNMC, and Opus One Solutions (“Opus One”). Opus One will provide contracted services to National Grid. All Project partners will be engaged throughout the duration of the Project.

BNMC, consisting of thirteen (13) member institutions and nearly one hundred (100) public and private companies that are a dynamic mix of health care, life sciences, medical education, and private enterprise, is spurring significant growth in Western New York. The BNMC serves as the umbrella organization of the anchor institutions that make up the Buffalo Niagara Medical Campus located within the 120-acre footprint bordering the areas of Allentown, the Fruit Belt, and downtown Buffalo. The BNMC (depicted in Figure 1) fosters conversation and collaboration among its member institutions, its partners, and the community to address various critical issues; including energy, entrepreneurship, access and transportation, workforce and procurement, neighborhood conditions, and healthy communities.

¹ 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), (“REV Track One Policy Order”), p. 31.



Figure 1: Part of the Buffalo Niagara Medical Campus

Opus One is a software engineering company which shares the vision for the Project to develop and deploy one platform that can accommodate a complete range of business models. Their role in the Project will encompass not only software development, but also thought leadership and Project planning and execution.

National Grid's Elm Street substation provides power to the BNMC and the majority of downtown Buffalo through local distribution stations via underground 23 kV circuits. The Elm Street substation steps down the voltage from 230 kV to 23 kV and acts as the central distribution point for most of the BNMC buildings. BNMC's annual electricity demand was 153 GWh and peak demand was 30 MW in 2015. BNMC's current DER capacity is over 34 MW with about 28 MW coming from the three major entities; Roswell Park Cancer Institute, University at Buffalo, and Kaleida Health. The 28 MW of DER capacity currently consists of twenty-four (24) diesel engine gensets and numerous buildings equipped with building energy management systems ("BEMS") wherein load shedding schemes can be implemented. BNMC is currently evaluating an increase in DER capacity through the addition of a combination of 19 MW of natural gas engine and turbine generators, 1 MW of solar photovoltaic ("PV"), and 150 kW (600 kWh) of battery energy storage. These additional DERs were identified in a feasibility study partially funded by the New York State Energy Research and Development Authority ("NYSERDA") Smart Grid Electric Power Transmission and Distribution ("EPTD") Program Opportunity Notice ("PON") 2715 and the NYSERDA RFP 3044 New York Prize Community Grid Competition.²

The proposed local DSP will communicate the electric distribution system needs of the Elm Street substation and local feeders and send dynamic price signal events to the POCs. The POCs will communicate with the DSP as to the availability of BNMC DERs to respond to local electric system needs and the willingness to accept price signal events. Within the market of the BNMC, the Project will evaluate what price signal events and/or other revenue opportunities motivate BNMC member institutions with DER capabilities to provide the DSP with local electric distribution system services at the POC level. The Project will also evaluate what revenue opportunities are needed to encourage further DER investment.

² See, *BMNC Community Microgrid, Stage 1-Feasibility Study Report*, prepared by BMNC, National Grid, the Electric Power Research Institute ("EPRI"), CDH Energy Corp., Navigant Consulting, Inc., and National Fuel Gas Company, March 2016.

The Project recognizes that opt-in bid-based events and bilateral contracts directly with the DER owner/operator or aggregator are additional options. However, until sufficient data is collected and analyzed, it will not be known if bid-based events will generate enough certainty to enable forecasting of responses, or if bilateral contracts will improve planning capabilities.

A high-level schematic of the key components of the Project (*i.e.*, DSP, POCs, and DERs) is presented in Figure 2 below. National Grid will license and operate the DSP.

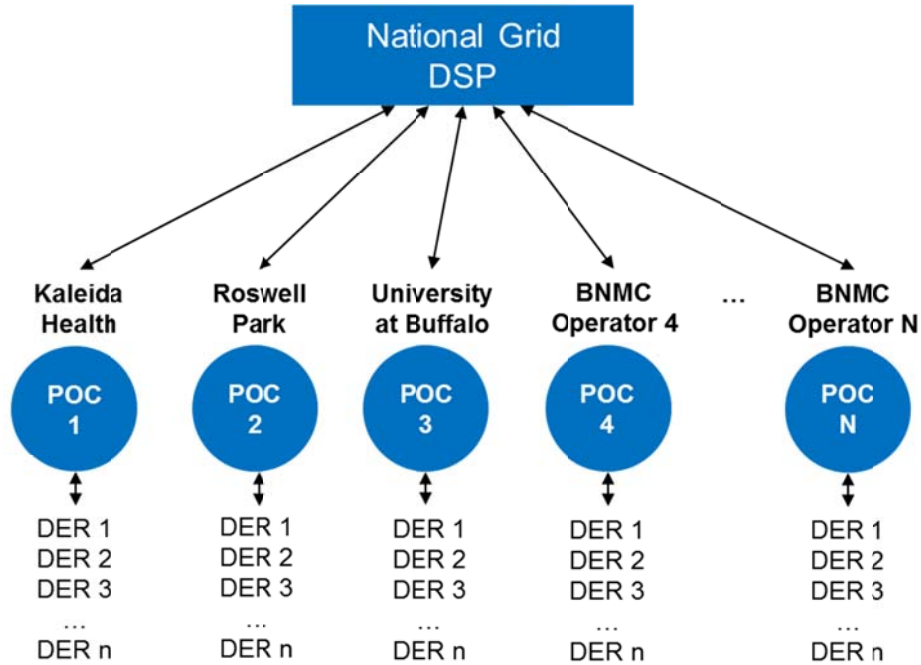


Figure 2: Schematic of DSP's Components

The Project will inform how best to engage current DER owners and operators with revenue opportunities that unlock their DER assets,³ via investment and return on investment ("ROI"), while considering operating constraints that may impede the utilization of those DER assets. An example of an operating constraint that may impede the utilization of diesel engine-based DERs in the Project is the current small-scale generation emissions regulations. The Project team anticipates the need to retrofit BNMC's existing Tier 2-compliant diesel engine gensets with Tier 4-compliant emissions control technology in order to be able to operate in non-emergency

³ The term "unlock" refers to the ability to use the DER assets for supplying power/energy and/or supporting the electric distribution system.

situations as required by the U.S. Environment Protection Agency (EPA).⁴ However, even after retrofitting existing diesel engine gensets, these DERs may face additional operating constraints depending on local or state-level emissions goals and/or additional operational constraints within the health services sector. Given the large number of Tier 2 diesel engine-based DER assets at BNMC and across New York State that are required for emergency backup power (but sit idle most of the year due to emissions regulations), overcoming these operating constraints will be necessary so that early adopters can engage in the DSP.

The expected Project outcomes can lead to optimization of the local electric distribution system and the desired objectives of the larger, system-wide DSP as noted in the REV Track One Policy Order. Successful deployment of a small-scale DSP, as developed and tested through the Project, is expected to result in a better understanding of DSP market dynamics that can be applied to a full-scale DSP rollout across the National Grid electric service territory.

Business Model Overview

The Project will test the ability of the DSP to facilitate participation of existing DERs in various electric distribution system opportunities (e.g., energy supply and peak load modification), as well as provide informed decision-making as to whether BNMC member institutions should invest in additional DER assets. Additional investment opportunities include both new DER assets (e.g., natural gas, solar PV generation, and/or battery energy storage) and retrofits to existing DER assets (e.g., emissions reduction technologies for diesel generators). BNMC's existing DER assets, potential future DER assets, and future microgrid capabilities were presented in the revised scope filed for the Project.

The BNMC provides an excellent DSP test bed due to the willingness of the BNMC to participate and the existing and potential future DER assets available for the Project. National Grid and other stakeholders can use lessons learned from the Project to inform National Grid's larger, system-wide DSP.

Proposed Solution

The Project seeks to test and develop services based on a DSP that would communicate with network-connected POCs associated with BNMC DERs. A schematic of the DSP component interactions for a price signal event is presented in Figure 3 below. Throughout the course of the Project, the Project team will evaluate the effectiveness of this communications platform. When the DSP for BNMC is successfully deployed, National Grid and BNMC anticipate up to thirty-three (33) BNMC DERs could be controlled by multiple POCs, where the POCs will communicate with the DSP via secure internet connections.

⁴ U.S. EPA emissions standards for nonroad engines were structured as a 4-tiered progression with increasingly stringent emissions requirements (*i.e.*, Tier 1 phased-in from 1996 to 2000, Tier 2 phased-in from 2001 to 2006, Tier 3 phased-in from 2006 to 2008, and Tier 4 phased-in from 2008 to 2015). The Tier 1-3 standards were met through advanced engine design, with no or only limited use of exhaust gas aftertreatment systems. Tier 4 emission standards introduced substantial reductions of nitrogen oxides ("NOx") and particulate matter ("PM"), as well as more stringent hydrocarbon ("HC") emissions limits. Such emission reductions can only be achieved through the use of advanced aftertreatment control technologies (e.g., selective catalytic reduction, diesel particulate filters) similar to those required by the 2007-2010 standards for highway engines. However, unlike highway engines, the stationary engine owner/operator is responsible for emission compliance for Model Year 2008 and earlier engines. Note that stationary diesel engines used only for emergencies (e.g. as stand-by generator sets) are exempted from Tier 4 emission requirements. Source: DieselNet (https://www.dieselnet.com/standards/us/stationary_nsps_ci.php)

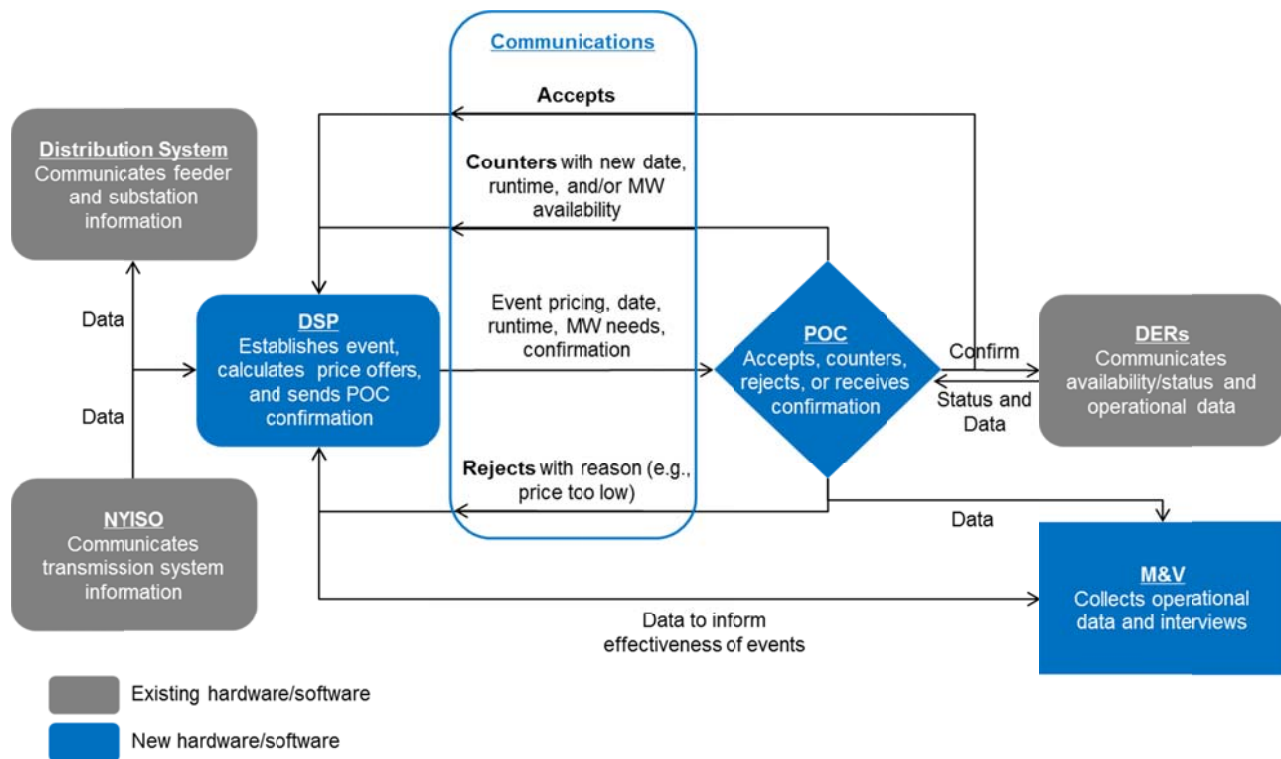


Figure 3: Schematic of DSP Component Interactions for a Price Signal Event

Hypotheses Being Tested

The Project will demonstrate how customers with DER capabilities can be motivated to operate those DERs for the benefit of the overall electric distribution system during unconstrained (“blue sky”) or constrained (“peak period”) electric distribution system operations. Specifically, the Project will evaluate what price signals and/or other revenue opportunities will motivate BNMC member institutions with DER capabilities to provide the National Grid DSP with local electric distribution system services at the POC level. In addition, the Project will provide insight into the types of revenue opportunities that could encourage additional DER investment.

The Project seeks to test three key hypotheses:

1. The functional and operational benefits flowing from the POC, based on the capabilities of customer-to-grid DER, can be successfully monetized by sending a price signal that is reasonably close to the benefit seen by the distribution system;
2. Customer participation will increase as the offered electricity prices increase, risks decrease, and/or other revenue opportunities are made available; and
3. Prevailing electricity prices or other revenue opportunities can provide sufficient financial motivation for customer investment in new DERs and participation in animated markets.

There are many factors to evaluate when considering the financial model that will provide potential opportunities for customers in the DSP marketplace, including:

- Capabilities of each DER technology;
- Constraints and/or limitations of the DER technology;
- Constraints and/or limitations of the DER participant;

- Operation of the DER technology when providing the service requested; and
- Information that will help customers assess risk when considering potential investment in DER capability or provision of services with existing DER capability.

These factors require a capability assessment of each DER to assist in the efficient operation of the local electric distribution system without compromising the provision of safe and reliable service. This evaluation will additionally provide information to help customers evaluate their risks and tolerance for investment and may lead to development of potential infrastructure improvements.

While the DSP market structure, the services it transacts, and its transactional mechanisms will evolve over time, a successful DSP will provide day-ahead or contractual price signals to customers with DERs such that those customers will choose to actively participate in market activities. As such, initial development of the DSP framework will require standardization in planning, market functionality, operations, and customer interfaces to efficiently and effectively attract market participants.

Approach

In the near term, services transacted and purchased by the DSP will test the implementation of a “LMP+D+E”⁵ financial model approach for electric services. This model will evaluate the potential for the customer to optimize their capabilities in order to improve the operation of the electric distribution system. In the LMP+D+E model, “LMP” refers to location-based marginal price, which includes the wholesale price of energy, transmission congestion charges, and transmission line losses. For LMP, the Project will consider New York Independent System Operator (“NYISO”) location-based marginal prices (“LBMP”) Zone-A West for day-ahead and real-time market prices⁶ and any additional capacity constraints and transmission losses that may be priced into the local area through the New York Installed Capacity Market (ICAP), if they can be determined.

“D” refers to distribution delivery value, which is the value that DERs can provide to the electric distribution system, such as load relief to help alleviate substation or feeder peak power constraints, reduction of line losses, and alleviation of voltage issues. Energy supply, volt-ampere reactive (“VAR”) support, voltage management, peak load modifications, and dynamic load management are some service examples that will be evaluated in the Project to test what drives new market opportunities. The value of D will be evaluated in the Project and is expected to generate sufficient financial incentives for DERs to participate in the DSP market. The value of D takes into consideration potential issues along the distribution grid such as substation and

⁵ See Case 15-E-0751 – *In the Matter of the Value of Distributed Energy Resources* (“Value of D Proceeding”), Notice Soliciting Comments and Proposals on Interim Successor to Net Energy Metering and of a Preliminary Conference (issued December 23, 2015), Attachment A, p. 2, where “‘LMP’ represents the location-based marginal price of energy, and ‘D’ represents the full range of additional values provided by the distribution-level resource” and where “[i]n the NEM Ceilings Order, the Commission further elaborated that “[t]he ‘value of D’ can include load reduction, frequency regulation, reactive power, line loss avoidance, resilience and locational values as well as values not directly related to delivery service such as installed capacity and emission avoidance.” See also, Value of D Proceeding, Comments of the Solar Progress Partnership on an Interim Successor to Net Energy Metering, p. 7, where “E” represents ‘externalities’ or “social benefits that may be provided by DER but which are not captured in current markets.”

⁶ New York Independent System Operator LBMP and real-time pricing information. Source: http://www.nyiso.com/public/markets_operations/market_data/pricing_data/index.jsp

feeder constraints. This evaluation effort will analyze potential issues with capacity provision by considering average demand, peak demand, forecasts of demand growth, day-ahead load forecast, and historical demand at the feeder and substation levels. After analyzing these issues, values can be assigned to each of these items.

“E” refers to external or societal value (e.g., low carbon, renewable, or domestic fuel source) that may be provided by DERs that are not captured in in LMP or D. The Project does not intend to evaluate a specific value of E.

Scope

In order to provide a solid basis and framework for the DSP approach, the Project will focus on the annual and day-ahead planning timescales for DERs. These timescales should provide significant opportunity for DERs and the DSP provider, as well as distribution system benefits, in the context of the Project. Distribution system benefits may include operational savings (e.g., loss minimization, power quality management), capital deferral (e.g., load relief and other non-wires alternatives), and revenue generation (e.g., DSP access fees, DSP revenue sharing, and DSP services such as analytics). Figure 4 below summarizes some of the DSP services and timescales that will be evaluated in the Project. The Project may also identify other services/products beyond what is presented in Figure 4 that could provide greater benefits, including those that are not currently being offered by the NYISO or other markets.

DSP Service	Annual	Day-Ahead	DER Response Examples
Energy Supply	X	X	Generation, energy storage, demand response
Volt-Ampere Reactive (VAR) Support	X	X	Power electronics (energy storage, solar PV inverter) power factor setting
Voltage Management		X	Power electronics (energy storage) voltage control, VAR control (indirect)
Peak Load Modification	X	X	Generation, energy storage, demand response
Dynamic Load Management		X	Demand response

Figure 4: Examples of DSP Services and Applicability to Annual and Day-Ahead Timescales

The DSP for the Project will provide revenue-generating (and revenue savings) opportunities, predominantly during blue sky and grid-constrained days. Additional efforts can build on this work to extend the DSP operation to intraday planning timescales (e.g., hour-ahead, minute-ahead, near real-time) to address immediate (i.e., emergency) distribution system events.

Demonstration Design

Project Overview

The Project will be conducted in three (3) phases by National Grid and its partners. Phase 1 involves development of a DSP financial model that will provide the opportunity for BNMC

member institutions to consider use of potential DER assets. To build the DSP financial model, event-driven pricing will be generated for day-ahead peak periods and contractual pricing will be used for blue sky periods. Thereafter, the model will be tested using historical data to determine the prices for each service requested from BNMC DERs. In Phase 2, the DSP financial model implemented in Phase 1 will be used to develop the technical functionality of the DSP and the POCs. In Phase 3, a field demonstration will be conducted which will include: deployment of the DSP and POCs with BNMC DER assets; measurement and verification (“M&V”) tasks; and evaluation of results. Throughout the Project, go/no-go decision points will be used to solicit feedback from DER participants and the Company and, if necessary, to explore the development of additional scenarios and pricing models. Figure 5 below summarizes the interactions within and between each phase.

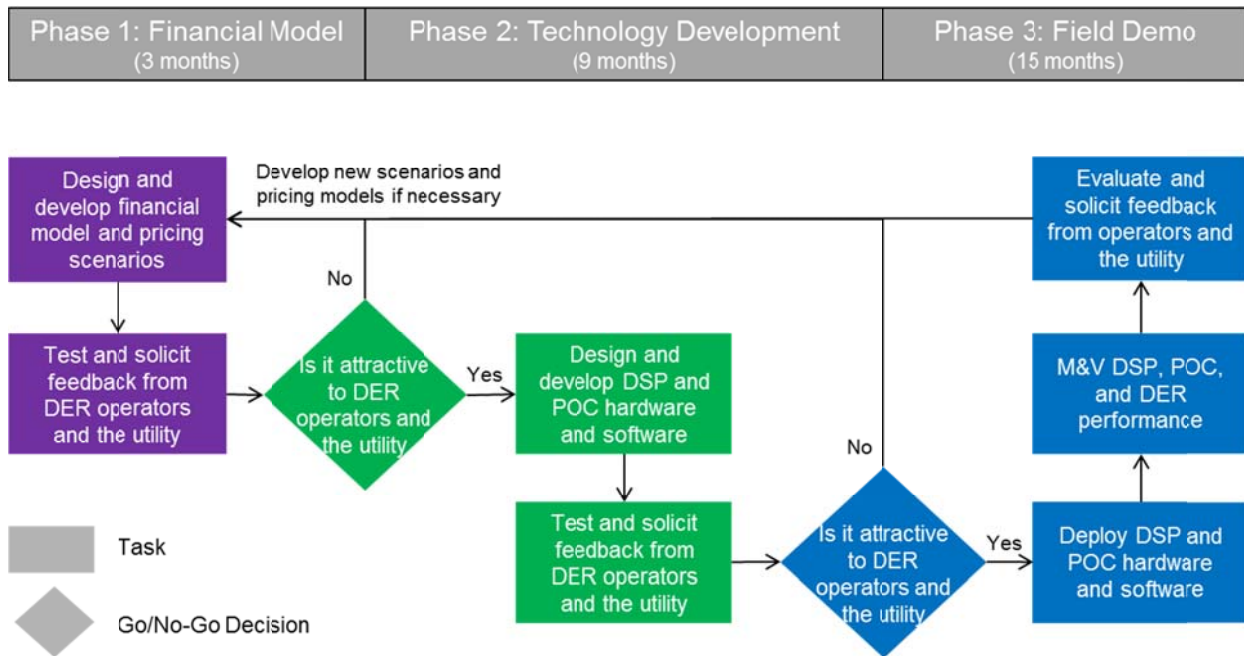


Figure 5: Project Phase Interactions

Phase 1: Financial Model

In Phase 1, a detailed DSP financial model will be developed that can be used to test which DER capabilities are most cost-effective, and the willingness of customers to participate in DSP market activities. The LMP+D approach described above will be used as a basis for the proposed DSP financial model. NYISO LBMP and ICAP values will be used as the LMP base price. National Grid planning and operational data will be used to determine the value of D portion of the LMP+D price (which includes kWh loss minimized, voltage events mitigated, kWh conserved from voltage reduction, kW peak load reduced, and kW peak supply generated). The DSP financial model will be populated with historical data so DER participants can determine how existing DERs, as well as potential new DERs, can be leveraged in the market. In Phase 1, options will also be developed for National Grid to generate new revenue streams, such as providing: one-time data as a service for distribution optimization opportunities; pricing options for access to the DSP only; and pricing options for access to the DSP and POCs. These options will be evaluated and developed to provide DER participants with flexibility for products and services provided by the Company. At the end of Phase 1, a go/no-go decision will be

made, based on whether the DSP is financially attractive to both DER participants and National Grid.

Phase 2: Technology Development

The DSP financial model and other work completed in Phase 1 will inform the development, customization, and integration of a successful DSP-POC platform in Phase 2 of the Project. The DSP will be licensed and operated by National Grid and developed with the Project's partners. Various POC ownership models will be evaluated, but for the purposes of the Project, the POC will be licensed by National Grid and operated by the participating BNMC members. At the end of Phase 2, a go/no-go decision will be made based on whether the DSP is financially attractive and a successful solution platform for both DER participants and the Company.

Phase 3: Field Demonstration

In Phase 3, the Project partners will: determine the operational readiness of a POC at participating members' sites; stand up the network and communications with each POC; prepare the participating members' DERs for participation in DSP events; and deploy and operate the local DSP at National Grid. Once all of these tasks have been completed, the DSP will start to generate and send price signal events to the POCs. The POC operators will be able to respond to the price signal events and confirm the participation of the DERs. All participation types (accept / counter-offer / decline) will be recorded by the DSP for reconciliation and reporting purposes. The participation rate of BNMC DERs, and the degree to which the local electric distribution system is optimized, will be key findings for the Project.

Test Statements

Phase 1: Financial Model

Test Statement	Hypothesis “If” Statement	“Then” Statement
1. The locational marginal value of DERs can be financially modeled as LMP+D.	A. If the NYISO LBMP and ICAP values are representative of the wholesale value...	Then these components can comprise the LMP portion of the DSP financial model.
	B. If the quantification of DERs’ capabilities for voltage management, VAR support, peak load management, and dynamic load management can be incorporated in the DSP financial model as the distribution system operational value...	Then these components can comprise the value of D portion of the DSP financial model.
2. The DSP financial model can demonstrate sufficient value for DER and utility participation.	A. If the DSP financial model can be populated with historical data for the different test scenarios and generate a range of values for DER participation...	Then DER participants will accept the functionality of the DSP financial model for development of the DSP market.
	B. If the DSP financial model can be populated with real-time and forecasted data and generate price signal events with a range of values for DER participation...	Then DER participants can effectively evaluate the price signal events that will be generated from the DSP financial model in field operation.
	C. If DER participants can expect sufficient financial returns for existing or new DERs under historical, real-time, and forecasted scenarios...	Then DER participants will be willing to participate in the DSP market and potentially invest in new DERs.
	D. If National Grid can generate positive financial returns from the DSP via new revenue streams...	Then National Grid should be able to experience similar positive results as the DSP is rolled out across the Company’s service territory.

Phase 2: Technology Development

Test Statement	Hypothesis “If” Statement	“Then” Statement
3. The DSP can create a technical and financial platform for DERs, with NYISO integration for market-based services.	A. If the DSP is integrated with planning and operational systems at National Grid, and with POCs for automated DER management and financial modeling...	Then the DSP can transmit price signal events for POC response to optimize electric distribution system performance.
	B. If the DSP is integrated with the NYISO for scheduled demand response or load reduction requests...	Then the DSP can trigger POC price signal events using price signals from the NYISO for load reduction requests..
4. POCs can become a central communication portal between the DSP and participating DERs.	A. If DER participants, whether individually or in aggregate, can be modeled technically and financially via POCs...	Then the POCs can represent DER participants and interface with the DSP to trigger price signal events and transactions.
	B. If the POCs and the DSP maintain a common, re-usable application programming interface (“API”) ⁷ ...	Then the POCs and the DSP can establish seamless interoperability for implementing a DSP market.

⁷ An application programming interface (“API”) is a language and message format comprised of routines, protocols, and tools to communicate with the operating system or some other control program or communications protocol.

Phase 3: Field Demonstration

Test Statement	Hypothesis “If” Statement	“Then” Statement
5. The DSP with POC model can enable an attractive and vibrant market for DER participation under both unconstrained and grid-constrained operations.	A. If the DSP provides the price signal events, manages transactions, provides platform services (e.g., data analytics, scheduling), and manages interoperability with the POCs...	Then DER participants will have efficient access and transparency to DSP information, services, and potential revenue streams via the POCs.
	B. If the DSP provides the market price signal events representing the dynamic locational marginal value of DERs on the distribution system (and these signals/revenue opportunities are attractive to the DER participants)...	Then DER participants will be able to extract financial and operational value from the DSP.
	C. If the market signals and other revenue opportunities developed by the DSP are sufficiently attractive to current DER participants and to the marketplace...	Then there will be financial motivation for investment in new DERs.
6. The DSP with POC model can enable significant electric distribution system benefits (operational and financial) under both unconstrained and grid-constrained operations.	A. If DERs can provide predictable operational capabilities, objectives, and constraints to the DSP, such as kW and kVAR capacity, energy duration, and dispatch frequency...	Then the DSP can rely on DERs with relative certainty in integrated distribution system planning.
	B. If the DSP can use price signal events to encourage DER participants to consistently engage with the market on a long-term basis...	Then the DSP can rely on DER participants to provide grid support to optimize day-to-day grid operations (such as reducing line loss and power quality management).
	C. If the DSP can use price signals to encourage DER participants to consistently engage with the market during short-cycle grid-constrained events...	Then the DSP can rely on DER participants to provide grid support to mitigate short-cycle grid constraints (such as load relief), which enables deferral of future distribution system infrastructure spending (similar to non-wires alternative projects).
	D. If the DSP can provide a financially attractive and reliable DSP market for the DER participants...	Then National Grid will have the opportunity to realize new revenue streams via the DSP operation (e.g., DSP access fees, DSP revenue sharing, and DSP services such as analytics).

Test Population

Test Population Description	Selection Method
BNMC members with existing or planned DER assets	The Project expects to interface primarily with BNMC's three major members (Roswell Park Cancer Institute, University at Buffalo, and Kaleida Health) because these entities have the largest number of DERs, totaling 28 MW from twenty-four (24) diesel engine gensets and 1 MW from demand response/load reduction capacity available from BEMS.

Test Scenarios

The following test scenarios will be evaluated with the DSP financial model developed in Phase 1 of the Project which includes new utility revenue streams. A subset of these scenarios will be selected for evaluation in Phases 2 and 3 of the Project. The test scenarios are designed to evaluate the level of DER participation on the DSP. Four (4) different services potentially provided by DER participants will be evaluated with the DSP financial model, transacted on the DSP market, and tested under two (2) grid operational environments. The four (4) services provided by the DER participants include: 1) energy services (e.g., kWh generation or conservation); 2) real power⁸ services (e.g., kW capacity generation or demand curtailment); 3) reactive power⁹ services (e.g., kVAR provided to the grid, either capacitive or inductive); and 4) multiple simultaneous services as a balanced combination of energy, real power, and reactive power services made available by DER participants. The two types of grid operational environments are: a) unconstrained operation (e.g., blue sky days) which represents the normal, everyday scenario where DER may provide lesser incremental value to grid operation but the frequency of price signal events is high; and b) grid-constrained operation (e.g., peak periods), which represents the infrequent but critical scenario where DER may provide significant value to grid operation but the frequency of price signal events is not as high.

⁸ Real power is the component of electric power that performs work, typically measured in kilowatts ("kW") or megawatts ("MW") and sometimes referred to as active power. The terms "real" or "active" are often used to modify the base term "power" to differentiate it from reactive power and apparent power. U.S. Energy Information Administration ("EIA") Glossary at: <http://www.eia.gov/tools/glossary/index.cfm?id=electricity>

⁹ Reactive power is the portion of electricity that establishes and sustains the electric and magnetic fields of alternating-current equipment. Reactive power must be supplied to most types of magnetic equipment, such as motors and transformers. Reactive power is provided by generators, synchronous condensers, or electrostatic equipment such as capacitors and directly influences electric system voltage. It is a derived value equal to the vector difference between the apparent power and the real power. It is usually expressed as kilovolt-amperes reactive ("kVAR") or megavolt-ampere reactive ("MVAR"). EIA Glossary at: <http://www.eia.gov/tools/glossary/index.cfm?id=electricity>

Test Scenario Descriptions

Scenario	Description
DER participants providing energy services on the DSP under unconstrained operation (e.g., blue sky days)	Evaluate market structure (e.g., fixed length contracts, day-ahead, event-driven calls) and customer participation for energy products (e.g., kWh generation and consumption) during unconstrained grid operation when the value of D is low for grid support and the number of price signal events for DER participation is high. Energy services will provide distribution value including capacity management and energy conservation.
DER participants providing energy services on the DSP under grid-constrained operation (e.g., peak periods)	Evaluate market structure and customer participation for energy products during constrained grid operation when the value of D is high and the number of events is low. Energy services from DER participants will provide value, including critical capacity management (e.g., during peak capacity periods).
DER participants providing real power services on the DSP under unconstrained operation	Evaluate market structure and customer participation for real power services (e.g., kW generation and demand curtailment) during unconstrained grid operation when the value of D is low and the number of events is high. Real power services will provide distribution value including capacity management, loss minimization, and voltage management.
DER participants providing real power services on the DSP under grid-constrained operation	Evaluate market structure and customer participation for real power services during constrained grid operation when the value of D is high and the number of events is low. Real power services from DER participants will provide value including critical capacity management, transfer capacity management (i.e., feeder load transfer during outage restoration), emergency load shedding/generation dispatch, and voltage management.
DER participants providing reactive power services on the DSP under unconstrained operation	Evaluate market structure and customer participation for reactive power services (e.g., kVAR, both capacitive and inductive) during unconstrained grid operation when the value of D is low and the number of occurrences is high. Reactive power services will provide distribution value including loss minimization, capacity management, and voltage management.
DER participants providing reactive power services on the DSP under grid-constrained operation	Evaluate market structure and customer participation for reactive power services during constrained grid operation when the value of D is high and the number of events is low. Real power services from DER participants will provide value including loss minimization, critical capacity management, and voltage management.
DER participants providing multiple simultaneous services on the DSP under unconstrained operation	Evaluate market structure and customer participation for multiple simultaneous services (e.g., energy, real power, and reactive power) during unconstrained grid operation when the value of D is low and the number of events is high. Assess dependencies, constraints, opportunities and potential outcomes for such multi-product operation for both the DSP and the DER participant (e.g., customer DERs balancing and co-optimizing between kWh, kW and kVAR).
DER participants providing multiple simultaneous services on the DSP under grid-constrained operation	Evaluate market structure and DER participation for multiple simultaneous services (energy, real power, and reactive power) during constrained grid operation when the value of D is high and the number of events is low. Assess dependencies, constraints and opportunities for such multi-product operation for both the DSP and the DER participant.

Check Points

Phase 1: Financial Model

Check Point	Description
1A. NYISO LBMP and ICAP values can comprise the LMP portion of the DSP financial model.	<p><u>Measure:</u> Internal stakeholder feedback on the elements of the LMP value.</p> <p><u>How and When:</u> Internal stakeholder discussions and meetings throughout Phase 1 of the Project.</p> <p><u>Resources:</u> NYISO LBMP and ICAP values, DSP financial model inputs for LMP values.</p> <p><u>Expected Target:</u> 100% internal stakeholder acceptance that the LMP component of the DSP financial model accurately reflects NYISO LBMP plus ICAP values.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Revisit DSP financial model inputs, identify stakeholder concerns and potential solutions to incorporate revised values for the DSP LMP components.</p>
1B. Quantifications of DER capabilities for voltage management, VAR support, peak load management, and dynamic load management can comprise the value of D portion of the DSP financial model.	<p><u>Measure:</u> Internal stakeholder feedback on the elements of the value of D.</p> <p><u>How and When:</u> Internal stakeholder discussions and meetings throughout Phase 1 of the Project.</p> <p><u>Resources:</u> National Grid planning, operations, finance, and rate departments; BNMC DER participant data; quantification of potential DER benefits to the distribution system (e.g., voltage management, peak load management); DSP financial model inputs for the value of D.</p> <p><u>Expected Target:</u> 100% internal stakeholder acceptance that the value of D component of the DSP financial model accurately reflects potential DER benefits to the distribution system.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Revisit DSP financial model inputs, identify stakeholder concerns, and identify potential solutions to incorporate revised values for the value of D components.</p>
2A. DER participants will accept the functionality of the DSP financial model for development of the DSP market.	<p><u>Measure:</u> Stakeholder feedback on the value of DER participation under the different test scenarios using historical data.</p> <p><u>How and When:</u> Stakeholder interviews and meetings throughout Phase 1 of the Project.</p> <p><u>Resources:</u> Historical data for demonstration feeder, substation, and DER participants; DSP financial model output.</p> <p><u>Expected Target:</u> 100% stakeholder acceptance of the DSP financial model output based on historical data.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Revisit DSP financial model outputs, identify stakeholder concerns and potential ways to make DER participation and investment more attractive.</p>
2B. DER participants can effectively evaluate the price signal events that will be generated from the DSP financial model in field operation.	<p><u>Measure:</u> Feedback from stakeholders on the value of DER participation under real-time and forecasted price signal event information.</p> <p><u>How and When:</u> Stakeholder interviews and meetings throughout Phase 1 of the Project.</p> <p><u>Resources:</u> DSP financial model output, DER participant financial models and inputs (e.g., internal rate of return ("IRR"), payback period).</p> <p><u>Expected Target:</u> 100% stakeholder acceptance of the DSP financial model output based on real-time and forecasted data.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Revisit DSP financial model outputs, identify stakeholder concerns and potential ways to make DER participation and investment more attractive.</p>

<p>2C. DER participants will be willing to participate on the DSP market and potentially invest in new DERs.</p>	<p><u>Measure:</u> Feedback from stakeholders on expected financial returns. <u>How and When:</u> Final stakeholder go/no-go meeting at the end of Phase 1 of the Project to review financial returns from historical, real-time, and forecasted scenarios. <u>Resources:</u> DSP financial model output; DER participant financial models and inputs. <u>Expected Target:</u> A minimum of 5 MW of DER asset participation planned to take part in the DSP market in Phase 2 of the Project. <u>Solutions / Strategies in case of results below expectations:</u> Revisit DSP financial model inputs and outputs, identify stakeholder concerns and potential ways to make DER participation and investment more attractive.</p>
<p>2D. National Grid should be able to experience similar positive results as the DSP is rolled out across the Company's service territory.</p>	<p><u>Measure:</u> Projected National Grid DSP revenue streams. <u>How and When:</u> Modeled results in Phase 1 of the Project and extrapolated results in Phase 2 of the Project. <u>Resources:</u> DSP financial model output, utility financial models and inputs, and Cost - Benefit Analysis Report. <u>Expected Target:</u> National Grid DSP revenue and ROI at least equivalent to existing revenue streams and returns. <u>Solutions / Strategies in case of results below expectations:</u> Revisit DSP financial model inputs and outputs; identify utility concerns and potential ways to make DER participation and investment more attractive.</p>

Phase 2: Technology Development

Check Point	Description
3A. The DSP can transmit price signal events for POC response to optimize electric distribution system performance.	<p><u>Measure:</u> Ability of the DSP to generate and broadcast price signal events at 5-minute intervals (based on the Project's Phase 1 DSP financial model results, but implemented in real-time system operations).</p> <p><u>How and When:</u> Use industry best practices for program development throughout Phase 2 of the Project, with final acceptance at end of Phase 2.</p> <p><u>Resources:</u> DSP financial model and software development processes.</p> <p><u>Expected Target:</u> DSP transmits all designed price signals at 5-minute intervals.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Evaluate integration with National Grid's information systems and identify gaps in translating distribution system optimization into price signal events; correct issues causing target shortfall.</p>
3B. The DSP can trigger POC price signal events using price signals from the NYISO for load reduction requests.	<p><u>Measure:</u> Ability of the DSP to generate and broadcast price signal events at 5-minute intervals (based on the Project's Phase 1 DSP financial model results, but implemented in real-time system operations).</p> <p><u>How and When:</u> Use industry best practices for program development throughout Phase 2 of the Project, with final acceptance at end of Phase 2.</p> <p><u>Resources:</u> DSP financial model and software development processes.</p> <p><u>Expected Target:</u> The DSP can trigger all designed events using load reduction request events from the NYISO at 5-minute intervals.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Evaluate integration with NYISO, identify and correct issues causing target shortfall.</p>
4A. The POC can represent DER participants and interface with the DSP to trigger price signal events and transactions.	<p><u>Measure:</u> Ability of the POC and DER participants to reliably communicate and interoperate via a common, reusable standard set of API protocols and software as defined in Phases 1 and 2 of the Project.</p> <p><u>How and When:</u> Using industry best practices for program development throughout Phase 2 of the Project, with final acceptance at end of Phase 2.</p> <p><u>Resources:</u> DSP financial model, software development processes.</p> <p><u>Expected Target:</u> A working set of open APIs that will provide 100% of the developed requirements for POC/DER interoperation.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Evaluate the POC-DER participant integration and the POC-DSP integration and identify and correct issues causing target shortfall.</p>
4B. The POC and the DSP can establish seamless interoperability for implementing a DSP market.	<p><u>Measure:</u> Ability of the POC and the DSP to communicate and interoperate via a common, reusable standard set of open API protocols and software as defined in Phases 1 and 2 of the Project.</p> <p><u>How and When:</u> Industry best practices for program development throughout Phase 2 of the Project, with final acceptance at end of Phase 2.</p> <p><u>Resources:</u> DSP financial model, software development processes.</p> <p><u>Expected Target:</u> A working set of open APIs that will provide 100% of the developed requirements for DSP/POC interoperation.</p> <p><u>Solutions / Strategies in case of results below expectations:</u> Evaluate the POC-DSP integration, identify and correct the issues causing target shortfall.</p>

Phase 3: Field Demonstration

Check Point	Description
5A. DER participants will have efficient access and transparency to DSP information, services, and potential revenue streams via the POCs.	<p><u>Measure:</u> Time requested for roundtrip communication of events between DSP, POCs, and DERs.</p> <p><u>How and When:</u> Weekly DSP Reports throughout Phase 3 of the Project.</p> <p><u>Resources:</u> DSP event data files.</p> <p><u>Expected Target:</u> Time required for roundtrip communication is less than two (2) minutes for greater than 99% of price signal events, transactions, and other services between the DSP and POC, providing sufficient time for DERs to respond..</p> <p><u>Solutions/Strategies in case of results below expectations:</u> Identify and correct issue causing the target shortfall.</p>
5B. DER participants will be able to extract financial and operational value from the DSP.	<p><u>Measure:</u> Risk/benefit metrics (e.g., IRR, payback period, net present value, and capital investment) calculated from projected DER participant annual revenue and cost savings for providing distribution services.</p> <p><u>How and When:</u> Projections based on DSP financial model results and DER participant interviews throughout Phase 3 of the Project.</p> <p><u>Resources:</u> Electrical engineering model; DSP financial model, DSP event data files, and DER participant cost data.</p> <p><u>Expected Target:</u> Risk/benefit metrics (e.g., IRR > 10%, payback period < five (5) years) that will successfully influence DER participant investment necessary to achieve a DER participation rate of 5 MW and/or 10 hours per month (on average).</p> <p><u>Solutions/Strategies in case of results below expectations:</u> Refine DSP financial model, modify the DSP approach, and/or work with regulatory and policy stakeholders to strengthen benefits and/or reduce risk.</p>
5C. There will be financial motivation for investment in new DERs.	<p><u>Measure:</u> BNMC DER participants' actual and/or planned investment in DER assets necessary to provide distribution services</p> <p><u>How and When:</u> DER participant interviews and discussions at the start and end of Phase 3 of the Project.</p> <p><u>Resources:</u> DSP financial model; DER participant investment plans and activities.</p> <p><u>Expected Target:</u> Actual or planned investment in upgrading existing DERs (e.g., emissions control, flex fuel technologies, BEMS upgrades) and/or new types of DER assets (e.g., solar PV) necessary to provide an incremental minimum of 5 MW and/or 10 hours of operation per month (on average).</p> <p><u>Solutions/Strategies in case of results below expectations:</u> Refine DSP financial model or modify DSP approach to strengthen benefits; work internally and with partners to mitigate DER interconnection and participation challenges.</p>
6A. The DSP can rely on DERs with relative certainty in integrated distribution system planning.	<p><u>Measure:</u> Projected and actual DER supplied power / energy for both constrained and unconstrained opportunities.</p> <p><u>How and When:</u> Projections based on DSP financial model results; monthly DSP and M&V reports throughout Phase 3 of the Project; meetings with National Grid planning team to determine capabilities needed to consider DERs as non-wires alternatives.</p> <p><u>Resources:</u> DSP financial model; DSP data files; electrical engineering model; and M&V reporting.</p> <p><u>Expected Target:</u> Actual MW/MWh received within 25% of targets predicted</p>

	<p>by the financial model.</p> <p><u>Solutions/Strategies in case of results below expectations:</u> Refine financial model or DSP approach to strengthen benefits; work internally and with partners to mitigate challenges.</p>
<p>6B. The DSP can rely on DER participants to provide grid support to optimize day-to-day grid operations (such as reducing line loss and power quality management).</p>	<p><u>Measure:</u> Distribution system voltage and frequency, distribution losses, and power quality with and without expected DER participants; estimated operational savings (including reduced wholesale purchases, distributed generation (“DG”) interconnection processes, voltage optimization, and loss minimization).</p> <p><u>How and When:</u> Monthly DSP and M&V reports throughout Phase 3 of the Project.</p> <p><u>Resources:</u> Electrical engineering model; DSP data files, and M&V reporting.</p> <p><u>Expected Target:</u> Case-by-case distribution system optimization using DERs targets (e.g., conservation voltage reduction (“CVR”) level, voltage loss), while maintaining voltage and power quality within accepted ANSI C84.1 standards, and estimated operational savings insufficient to pay for DSP incentives to DER participants (when combined with 6C below).</p> <p><u>Solutions/Strategies in case of results below expectations:</u> Refine financial model or DSP approach to strengthen benefits; work internally and with partners to mitigate DER integration challenges.</p>
<p>6C. The DSP can rely on DER participants to provide grid support to mitigate short-cycle grid constraints (such as load relief), which enables deferral of future distribution system infrastructure spending (similar to non-wires alternative projects).</p>	<p><u>Measure:</u> Peak load reduction achieved and distribution utility planning current spend projections with and without expected DER participation (i.e., comparing load tap changer operations, peak loads, feeder peak capacity requirements, etc.).</p> <p><u>How and When:</u> Monthly DSP and M&V reports throughout Phase 3 of the Project; distribution planning annual projections.</p> <p><u>Resources:</u> Electrical engineering model, DSP data files, financial model, and M&V reporting.</p> <p><u>Expected Target:</u> Peak load reductions and estimation of capital deferral identified and sufficient to pay for DSP incentives to DER participants (when combined with 6B above).</p> <p><u>Solutions/Strategies in case of results below expectations:</u> Refine DSP financial model or DSP approach to strengthen benefits; work internally and with partners to mitigate DER integration challenges.</p>
<p>6D. National Grid will have the opportunity to realize new revenue streams via the DSP operation (e.g., DSP access fees, DSP revenue sharing, and DSP services such as analytics).</p>	<p><u>Measure:</u> Projected National Grid DSP revenue streams.</p> <p><u>How and When:</u> Extrapolated results of the Project, plus monthly M&V reports throughout Phase 3 of the Project.</p> <p><u>Resources:</u> Electrical engineering models; DSP financial model; M&V reporting; and Cost - Benefit Analysis Report.</p> <p><u>Expected target:</u> National Grid DSP revenue and ROI at least equivalent to existing revenue streams and returns.</p> <p><u>Solutions/strategies in case of results below expectations:</u> Refine DSP financial model or DSP to strengthen financial attractiveness.</p>

The information needed to validate each Check Point listed above will be included in regular reports throughout the Project. The table below summarizes the information that National Grid anticipates will be included in each report, as well as the anticipated reporting frequency.

Report	Information	Check Point	Frequency
DER Risk / Benefit Assessment Reports – Phases 1-3	Projected DER participant annual revenue, costs, and cost savings for providing distribution services based on DER participant needs and historical and forecasted data, which can be used by potential participant as a tool for investment decisions.	5B	On request
DSP Reports – Phase 3	Event Details: DER participation; frequency; lag time and type of communication events between the DSP, POCs, and DERs. DER Revenue: Projected DER participant annual revenue for providing distribution services.	5A, 6A, 6B, 6C	Monthly
DER Participant Interviews – Phases 1-3	DER Costs: Projected DER participant annual costs and cost savings for providing distribution services. BNMC interest in new DER investment to provide distribution services.	1A, 1B, 2A, 2B, 5B, 5C	Twice per Phase
M&V Reports – Phase 3	Distribution System Operation: Voltage and frequency, distribution losses, and power quality with and without expected DSP operations. Distribution System Planning: Peak load reduction and distribution planning spend projections with and without expected DSP operations (<i>i.e.</i> , comparing load tap changer (“LTC”) operations, peak loads, feeder peak capacity requirements, etc.).	6A, 6B, 6C, 6D	Monthly
Utility Cost / Benefit Analysis Reports – Phases 1-3	Distribution System Benefits: Operational savings; capital deferral, and revenue generation.	2D, 6D	Quarterly

Project Structure & Governance

Project Team

National Grid Skill Sets	BNMC Skill Sets	Opus One Skill Sets
Engineering	Program Design	Software Development
Tariff Design	Stakeholder Engagement	Data Analytics
Contracting	DER Operations	DER Management
Information Systems	Asset Management	Microgrid Energy Management
Cybersecurity		Transactive Energy Operations
Data Analytics		User Interface/Experience Design
Stakeholder Engagement		Systems Integration/Interoperability
Communications, Media Relations, and Marketing to the Larger Community		Stakeholder Engagement
Government Relations		Grid/DER/Microgrid Business Models,
Program Management		Financial Modeling
Project Management		Simulation and Testing
		Team/Project Management

In consideration of the skill set requirements, the Project will be staffed as follows:

National Grid Team Member	Relevant Skill Sets	Contact Information
Ron Diorio	Program management, information systems (system architecture, Information Technology/Operation Technology ("IT/OT"))	ronald.diorio@nationalgrid.com (781) 907-2597
Dennis Elsenbeck	Stakeholder engagement, government relations	dennis.elsenbeck@nationalgrid.com (716) 831-7748
Stephen Lasher	Engineering (network impacts)	stephen.lasher@NationalGrid.com (401) 525-5640
Dale Kruchten	Advanced data analytics	dale.kruchten@nationalgrid.com (516) 545-2434
Mark Domino	Engineering (distribution and sub-transmission NY)	mark.domino@nationalgrid.com (781) 907-3050
Pamela Dise	Tariff design	pam.dise@nationalgrid.com (315) 428-5172
Muks Ravipaty	Cybersecurity	mukand.ravipaty@nationalgrid.com (781) 907-2992
Brian Cronin	Communications, media relations, marketing to the larger community	brian.cronin@nationalgrid.com (781) 907-1763
Daniel Payares Luzio	Project management, engineering	daniel.payaresluzio@nationalgrid.com (781) 907-3839

BNMC Team Member	Relevant Skill Sets	Contact Information
Paul Tyno	Program design, stakeholder engagement	ptyno@bnmc.org (716) 218-7354

Opus One Team Member	Relevant Skill Sets	Contact Information
Alison Smith	DER management, microgrid energy management, grid/DER/microgrid business models, stakeholder engagement, team/project management	asmith@opusonesolutions.com (917) 612-6416
Joshua Wong	DER management, microgrid energy management, transactive energy operations	jwong@opusonesolutions.com (416) 818-1518
Roger Moore	Software development, data analytics, user interface/user experience ("IU/UX") design, systems integration, interoperability	rmoore@opusonesolutions.com (647) 385-8007
Mark Jaggassar	Software development, data analytics, IU/IX design, systems integration/interoperability	mjaggassar@opusonesolutions.com (647) 639-7930
Wajid Muneer	DER management, microgrid energy management, software development, data analytics, systems integration/interoperability	wmuneer@opusonesolutions.com (519) 998-7719

Roles & Responsibilities

National Grid Role	Description
Program Management and Design	Design, develop and execute end-to-end Project
Stakeholder Engagement and Government Relations	Continue to develop stakeholder engagement and government relations
Advanced Analytics and Data	Assist in the development of analytical needs
Information Systems	Provide systems, networking, and communications and integration needs for internal components
Engineering Support	Provide information on electric feeders and electric distribution needs, planning, and operations
Tariff Design and Pricing	Partner in the developing of the DSP financial model
Cybersecurity	Ensure all aspects meet National Grid standards
Communications, Media Relations, and Marketing to the Larger Community	Oversee all aspects of communications, media relations and marketing

BNMC Role	Description
Program Design	Facilitate market structure design
Stakeholder Engagement	Serve as portal to multiple commercial customers and asset owners
Operations Insight	Connect current work and other studies into design for efficiency of results

Opus One Role	Description
Financial Modelling	Assist National Grid in financial modelling and pricing scenarios, including DER valuation
Software Development	Code development, UI/UX design, transactive energy process design
Simulation and Testing	Market and technical simulations on DSP and POC interactions, operationalize test case scenarios
Systems Integration	Assist National Grid and BNMC on systems integration of the DSP/POC solution

Governance

Demonstration Steering Committee	
National Grid Participants	Partner Participants
Carlos Nouel	Paul Tyno – BNMC
Dennis Elsenbeck	Alison Smith – Opus One
Ron Diorio	Joshua Wong – Opus One

Demonstration Making Logistics	
Meeting Format	Meeting Frequency
Short-format tactical conference call with key National Grid and partner workstream owners	Weekly
In-depth tactical conference call with key National Grid and partner workstream owners	Monthly
In-person performance evaluation and strategy setting meeting with workstream owners and senior leadership from National Grid and the Project's partners	Quarterly
In-person performance evaluation and strategy setting meeting with workstream owners, senior leadership from National Grid, and the Project's partners (as appropriate), and as needed with Staff	Quarterly (as appropriate)

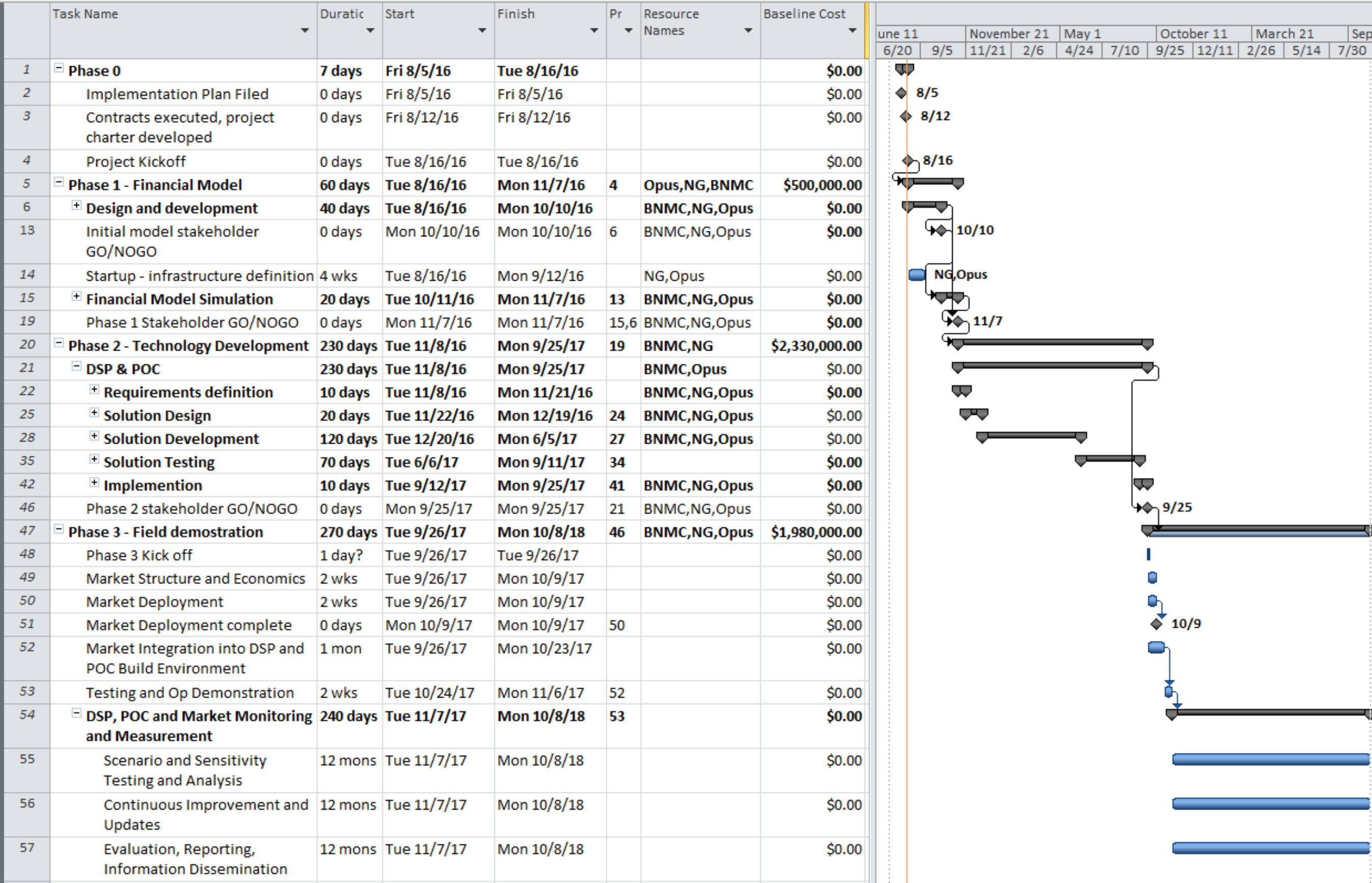
Work Plan & Budget

Project Plan

The timeline for each Phase of the Project is summarized below.

- Phase 1: Financial Model (three (3) months): completed three (3) months from the Project start date.
- Phase 2: Technology Development (nine (9) months): completed twelve (12) months from the Project start date.
- Phase 3: Field Demonstration (fifteen (15) months): completed twenty seven (27) months from the Project start date.

Prior to the start of each subsequent phase of the Project, there will be an internal go/no-go review. This will give greater flexibility to refine the scope of work and/or budget requirements as necessary to meet the Project's goals.



Project Budget

Project Budget Requirement		Phase 1		Phase 2		Phase 3		Total Project	
		CAPEX	OPEX	CAPEX	OPEX	CAPEX	OPEX	CAPEX	OPEX
Opus One	Software License - 50% start of phase 2			\$500,000				\$500,000	
	Software License - 50% start of phase 3					\$500,000		\$500,000	
	Program management	\$250,000		\$750,000		\$1,000,000		\$2,000,000	
	Software development			\$2,000,000				\$2,000,000	
National Grid	Resources	\$250,000		\$750,000		\$125,000	\$125,000	\$1,125,000	\$125,000
	IT Integration Services			\$200,000				\$200,000	
	IT Hardware/Software			\$25,000				\$25,000	
	IT Network and communications			\$75,000				\$75,000	
Subtotal		\$500,000	\$0	\$4,300,000	\$0	\$1,625,000	\$125,000	\$6,425,000	\$125,000
	Cost Share (in-kind software development)			\$2,000,000				\$2,000,000	\$0
	Annual operational costs				\$30,000		\$230,000	\$0	\$260,000
Total Funding Request		\$500,000	\$0	\$2,300,000	\$30,000	\$1,625,000	\$355,000	\$4,425,000	\$385,000

Ongoing Annual Operational Costs		Year 1		Year 2	
		CAPEX	OPEX	CAPEX	OPEX
Opus One	Annual license maintenance 20%		\$0		\$200,000
National Grid	Integration Services		\$20,000		\$20,000
	Hardware 10%		\$2,500		\$2,500
	Network and communications 10%		\$7,500		\$7,500
Total Annual Operational Costs		\$0	\$30,000	\$0	\$230,000

National Grid resources as noted in the table are non-incremental. All other budget items are incremental costs.

Reporting Structure

Reporting Expectations

The Project Management team plans to file quarterly reports in order to showcase the progress made to date, as well as adjustments to schedules/budgets, metrics reporting, and a forecast of the next quarter's activities and milestones. Additionally, in order to maintain flexibility and maximize the potential for innovation and learning, the quarterly reports may contain other updates or deviations from the initial details provided herein. Staff will be consulted as to the specific content required for the quarterly reports, but the following major sections will be included in each report:

1. Executive Summary
2. Highlights Since Previous Quarter
 - a. Major Task Completion
 - i. Checkpoints, Milestones, Go/No-Go decisions
 - b. Challenges, Changes and Lessons Learned
3. Next Quarter Forecast
 - a. Checkpoints/Milestones Progress
4. Work Plan & Budget Review
 - a. Updated Work Plan

- b. Updated Budget
- 5. Progress Metrics
- 6. Appendices

To further ensure alignment, National Grid would also like to meet with Staff to discuss the quarterly progress reports. Any changes related to costs shall remain within the overall revenue requirement cap. Furthermore, as set out in Staff's letter dated June 24, 2015, 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. National Grid looks forward to continued collaboration with Staff beyond the formal quarterly reports.



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

February 1, 2017

VIA ELECTRONIC DELIVERY

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

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

**Niagara Mohawk Power Corporation d/b/a National Grid – Proposed
Smart Home Rate REV Demonstration Project Filing**

Dear Secretary Burgess:

In accordance with the requirements set forth in the Commission's May 19, 2016 Order Adopting a Ratemaking and Utility Revenue Model Policy Framework in Cases 14-M-0101, Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid" or the "Company") hereby submits the Company's Proposed Smart Home Rate REV Demonstration Project.

Please direct any questions regarding this filing to:

Stacey Hughes
Project Manager, New Products and Energy Services
National Grid
1125 Broadway
Albany, New York 12204
Tel.: 518-433-3580
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Hon. Kathleen Burgess, Secretary
NG Proposed Smart Home Rate REV
Demonstration Project
February 1, 2017
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Respectfully submitted,

/s/ Janet M. Audunson

Janet M. Audunson

Enc.

cc: Marco Padula, DPS Staff, w/enclosure (via electronic mail)
Denise Gerbsch, DPS Staff, w/enclosure (via electronic mail)
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Bryant Farley, w/enclosure (via electronic mail)



National Grid Proposed Smart Home Rate REV Demonstration Project Filing

Case 14-M-0101 – Reforming the Energy Vision (REV)

February 1, 2017

Niagara Mohawk Power Corporation
d/b/a
National Grid

Submitted to:

New York
Public Service Commission

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EXECUTIVE SUMMARY

On May 19, 2016, the New York Public Service Commission (“Commission”) in the Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (“Track Two Order”),¹ directed utilities to file one or more Smart Home Rate (“SHR”) demonstration proposals by February 1, 2017.²

On July 1, 2016 Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid” or the “Company”) filed a proposal for the Demand Reduction REV Demonstration Project (the “Project” or the “Clifton Park Project”)³ designed to provide residential customers in the Town of Clifton Park (“Clifton Park”) with price signals, tools and information, enabled by infrastructure investments and distributed energy resources (“DER”),⁴ to reduce electric demand during peak times and inform the Reforming the Energy Vision (“REV”) proceeding. On December 1, 2016, the New York State Department of Public Service Staff (“Staff”) filed the Assessment Report for the Project⁵ and on January 17, 2017 the Company filed the Project Implementation Plan.⁶

National Grid believes the Project aligns with the SHR criteria in the Track Two Order wherein the Commission asserts “[i]n keeping with the distinction between traditional consumers, active consumers, and prosumers, Staff recommended that prosumers should be served by an opt-in Smart Home rate (SHR) to advance the early adoption of sophisticated home energy management technologies. A SHR would unbundle price signals to incentivize different types of DER and energy management responses.”⁷

In order to further demonstrate a SHR, National Grid proposes to leverage the offerings, tools, and price signals being provided in the Clifton Park Project, through the offering of a voice recognition technology that will enable customers to control appliances in their home via use of a phone app or voice activated technology during times when electricity prices are high in order to reduce demand at their homes and create energy savings. This technology will be offered to customers in Clifton Park who enroll in the Company’s residential voluntary time-of-use

¹ Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* (“REV Proceeding”), Order Adopting a Ratemaking and Utility Revenue Model Policy Framework (“Track Two Order”) (issued May 19, 2016).

² *Id.*, p. 156.

³ National Grid’s July 1, 2016 submittal was an errata filing to replace the proposed Customer Convenience Demonstration Project for Clifton Park, contained within the Company’s July 1, 2015 submittal of a suite of REV demonstration projects, with a renamed project entitled “Demand Reduction Demonstration Project” to reflect the substantial revisions in scope from the original July 1, 2015 filing.

⁴ For the Clifton Park REV Demonstration Project, “DER” is defined as including energy efficiency, demand response, and renewable distributed generation offerings, consistent with the Commission’s definition in the REV Proceeding, Order Instituting Proceeding (issued April 25, 2014), p. 25.

⁵ REV Proceeding, REV Demonstration Project Assessment Report for National Grid: Demand Reduction Town of Clifton Park (filed December 1, 2016).

⁶ REV Proceeding, National Grid: Clifton Park Demand Reduction REV Demonstration Project - Implementation Plan (filed January 17, 2017).

⁷ REV Proceeding, Track Two Order, p. 134.

(“VTOU”) rate to further enable a customer’s ability to control their demand during higher price usage periods.

National Grid intends to initially pursue voice recognition technology but will continue to investigate and possibly implement other home energy management technologies that meet the intent of a SHR demonstration and could provide valuable insight as to what devices are more likely to result in residential demand reduction and energy consumption savings. The Company will revise its SHR filing(s) as appropriate should other technologies be proposed.

BUSINESS MODEL OVERVIEW

Challenges Being Addressed

As outlined in the Track Two Order,⁸ SHRs must meet certain criteria which are summarized below:

1. SHRs should advance the early adoption of sophisticated home energy management technologies;
2. SHRs would unbundle price signals to incentivize different types of DER and energy management responses;
3. SHRs should be opt in for customers;
4. SHRs should be provided on a demonstration basis;
5. SHR demonstrations that are geographically concentrated will maximize both the network value and the demonstration value of the SHR;
6. SHRs should be compatible from the standpoint of DER providers;
7. SHRs should include a hold harmless provision that assures participating customers that their investments will not be stranded by superseding developments; and
8. Utilities should collaborate with the New York State Energy Research and Development Authority (“NYSERDA”) and with third-party developers to identify one or more SHR demonstration projects

Proposed Solution

A. The Clifton Park Project as a Smart Home Rate

A review of the Clifton Park Project confirms that many of the SHR criteria are being met by the Project. The Project is comprised of the following components:

1. Infrastructure
 - Advanced Metering Functionality (“AMF”)

⁸ *Id.*, pp. 134-137.

- Volt/VAR Optimization (“VVO”)
- 2. Community Energy Supply Procurement
- 3. Deep Energy Insights and Actionable Information
- 4. Price Signals
 - Peak Time Rewards (“PTR”)
 - Direct Load Control (“DLC”)
 - Residential VTOU Rate
- 5. DER Services
- 6. Community Outreach and Engagement

Several of the Clifton Park Project’s components meet the criteria of a SHR as identified above.

1. **SHR should advance the early adoption of sophisticated home energy management technologies** - Phase 1 of the Project will provide residential customers with a customer energy information portal, high bill alerts, enhanced home energy reports, energy savings tips, and DER offerings. Phase 2 of the Project will provide customers with advanced metering functionality (“AMF”) -enabled weekly energy overview emails, AMF-enabled enhanced customer portal with data browser and rate analysis tool, and price signal communications.
2. **SHR would unbundle price signals to incentivize different types of DER and energy management responses** - There are several offerings included in the Project that will be available to customers to incentivize energy management responses and use of DER.
 - a. National Grid will collaborate with Clifton Park and an independent energy manager that will seek, through competitive solicitation, an Energy Service Company (“ESCO”) partner(s) to provide residents with electric and gas supply. If Clifton Park agrees to move forward, this Community Energy Supply Procurement will provide participating customers with more stable supply prices (*e.g.*, fixed price for one year), and will result in increased community input in supply selection (*e.g.*, renewable choices reflecting the community’s energy goals). In addition to providing supply to participants, the ESCO partner(s) will be asked to:

- Fund a program that rewards participants for reductions in demand during peak times (*i.e.*, Peak Time Rewards)
 - Propose other DER services (such as financing for solar installations) that will assist customers with managing their entire bill, including the supply portion
- b. Peak Time Rewards - In the event that customers opt out of Community Energy Supply Procurement, the Company will offer its own Peak Time Rewards (“PTR”) program to customers who have opted out or to all customers in the Project if the Community Energy Supply Procurement does not move forward. The PTR program will incentivize customers to reduce energy usage, potentially during peak time periods, via PTRs that provide a positive motivation to respond to energy price signals. Key elements include:
- Universal participation for all customers with AMF meters
 - Rewards given based on peak event participation
 - Up to 20 peak events expected to be called per year
 - Actively participating customers can earn gift cards for participation
- c. Direct Load Control (“DLC”) - In addition to the PTR program, customers will also be able to participate in the Company’s DLC program, in accordance with Rule 63 of P.S.C. No. 220 Electricity. Under the DLC program customers will be awarded incentives if they install a smart thermostat and allow their thermostats to be automatically and remotely controlled by the Company during DLC events (*i.e.*, peak times).
- d. Alternative Rates – The installation of the AMF meters will allow customers to participate in alternate rate designs. The rate design to be promoted and offered will be a residential VTOU rate. This rate will provide an on-peak and off-peak delivery rates, as well as an on-peak, off-peak and super peak supply rate. The super peak supply rate will be for weekday periods (excluding holidays) between 2pm and 6pm, during the summer months of June through August, when market prices are typically highest and demand on the electric distribution system is the greatest. Customers who participate in the Community Energy Supply Procurement, in the event Clifton Park elects to move forward, will not be billed the supply portion of the residential VTOU rate, but will be billed by the ESCO provider. However, any customer opting out of the Community Energy Supply Procurement will be eligible for the supply portion of this residential VTOU rate. The residential VTOU rate will be opt in for all customers. There will be a make whole provision for the first year on the VTOU rate for those customers who have electric vehicles. The VTOU rate will provide various price signals to customers

to encourage them to manage their energy usage to reduce their costs and also to reduce demand on the distribution system during peak periods.

3. **SHR should be opt in for customers** – The residential VTOU rate will be offered as opt in only, as will the DLC program. Other services such as energy efficiency upgrades and any additional DER services will be the customer’s sole choice.
4. **SHR should be provided on a demonstration basis** – The Project will be offered in the Clifton Park as a REV demonstration project.
5. **SHR demonstrations that are geographically concentrated will maximize both the network value and the demonstration value of the SHR** – The Project will be offered within the area of Clifton Park and will test the ability to maximize network and demonstration project value from the SHR.
6. **SHR should be compatible from the standpoint of DER providers** – The Company plans on partnering with DER providers to offer various DER services, such as energy efficiency upgrades.
7. **SHR should include a hold harmless provision that assures participating customers that their investments will not be stranded by superseding developments** – The Company will be utilizing the currently approved residential VTOU rate. A hold harmless provision is being offered to customers on the residential VTOU rate if they provide proof of ownership of an electric vehicle.
8. **Utilities should collaborate with NYSERDA and with third-party developers to identify one or more SHR demonstration projects** – The Company has had discussions with NYSERDA regarding energy vehicle tariffs and in home technologies and may pursue additional opportunities. Initially, the Company plans to integrate voice recognition technology as an additional home energy management technology offering to Clifton Park Project participants as described below.

B. Voice Recognition Technology

National Grid will enhance the Project’s ability to demonstrate a SHR by introducing a voice recognition technology that will enable customers to easily turn on and off certain appliances in the home in response to the calling of peak time events by the Company under the PTR program, or via texts or emails from the Company to notify customers enrolled in the residential VTOU rate just prior to the start of the super-peak period.

National Grid proposes to use voice recognition technology to provide customers more modern paths to enable customer load reduction when the Company may need it or when customers want to save the most money. Such technology can help the utility and the customer in the following ways:

- Amazon's voice service, Alexa, for example, can read a text or e-mail that National Grid sends when the utility needs load shedding;
- Customers who receive an alert from National Grid about a peak time need can control devices remotely via a phone app or just by asking Alexa, for example, to control connected devices;
- Customers can monitor and lower their energy use during peak pricing times in response to the information provided via the voice recognition technology;
- Customers can control home devices remotely or from their couch;
- The utility can incentivize control devices that are Wi-Fi-enabled to solve specific loading problems (*e.g.*, air conditioner ("AC") units, dehumidifiers, lighting); and
- Voice recognition devices can ease the burden of participating in a behavioral demand response program

Background

National Grid considered and dismissed, at this time, several technologies to integrate into the Clifton Park Project to enhance demand response objectives. Some of these, Ice Energy's Ice Cub thermal load storage technology for residential use, and EPRI's CEA 2045 protocol, for example, are traditionally utility-controlled demand response technologies. Other technologies such as that marketed by Sense (*i.e.*, energy disaggregation/circuit breaker level controls) are not fully vetted and are also typically utility-controlled. As the Project has been designed to test customer behavior in response to high prices and the ability to deploy technology to avoid those periods of high prices, the introduction of utility controlled technology would confuse the ability to test customer behavior.

Therefore, after considering these options, the Company proposes to work with voice control technology, such as Amazon Echo/Alexa-enabled devices, to make it easier for customers to control energy usage, drive down utility bill costs, take advantage of new billing tariffs and create an easy to use in-home and remote platform to do so.

The Technology

Voice recognition technology is recognizable, understandable, easy to use and will soon become ubiquitous in homes in New York and elsewhere. Apple's Siri has been answering questions on Apple phones for years. Amazon and Google (and others) have perfected the technology for home use.

Amazon’s Alexa, controlled through the Amazon Echo, is a smart speaker that can respond to voice commands. The Echo, and other devices like it, can control music, lighting, alarms, thermostats and can browse the internet for answers to questions or can order products on command. Specific to the Clifton Park Project, the Echo can provide information about energy usage, timing of a home’s peak energy usage, how much energy costs at the moment, and how much the homeowner’s solar panels are generating.

Echo/Alexa controls various devices via Wi-Fi/Bluetooth® including: ecobee, Nest, Honeywell and Emerson Sensi™ thermostats; plug loads via Samsung Smart Things™, TP-Link and WeMo® and lighting via Philips Hue, Insteon, and others.

Amazon’s technology may be most recognizable but there are also other examples: Apple’s Siri Home Kit, Google Home, Nucleus, Ivey Voice, and Microsoft’s Cortana which works with Windows OS.

Amazon’s Echo technology allows for “far field” voice control which means the voice control can come from across the room and Alexa will respond. With the smart phone app, the command can also come from across town.

Cost

The table below outlines the cost of popular voice recognition technologies. Amazon’s Echo and Google Home functions as a speaker – Microsoft and Apple technologies are apps or functions available with specific software purchases. All of these technologies require enabling devices to control energy use. Amazon’s Echo connected devices require Wi-Fi and Bluetooth® enablement.

Voice Control Unit Costs

Type	Price	Retailer
Amazon		Amazon
Echo-Black	\$180	
Echo Dot	\$50	
Google	\$130	Best Buy, Home Depot, etc.
Microsoft	\$120	Included with Windows 10
Apple Home	Free app	Siri control

The Company will competitively bid to select a technology and provide it at no cost to Clifton Park customers who enroll in the residential VTOU rate. The Company will work with the chosen vendor to enable customers to “train” devices to automatically accommodate the VTOU super peak times. Meaning, the identified devices will automatically turn off or turn down in accordance to tariff peak timeframes/predetermined economic tariff signals.

Utilities Using Voice Recognition Technologies

EDF Energy, an electric and gas utility with five million customers located in the United Kingdom, is using Amazon’s Echo/Alexa to provide customers with the ability to ask billing and usage questions of Alexa. EDF is working with Amazon to develop a new Echo “skill.” A skill is the method in which Alexa can answer questions or provide a service. An example of a skill would be setting up your Echo/Alexa to order pizza or an Uber. In EDF’s case, the skill is enabling Alexa to answer questions about various aspects of a customer’s bill/service. EDF is working on expanding the functionality to control technology.

Just Energy, an energy management solutions provider located in Texas, is using Alexa in much the same way as EDF. Just Energy has set up a skill which is found in the Alexa app. That skill provides customers with billing and usage information much like EDF. In addition, Just Energy is utilizing existing skills/services to help customers control thermostats, lighting, and other connected devices.

Hypothesis Tested

In addition to the hypotheses being tested as part of the Clifton Park Project, the introduction of voice recognition technology to the Project will allow the Company to test several SHR principles:

Statement...	If...	Then...
Infrastructure: Availability of certain technology will enable customers to respond quickly to price signals and information to reduce demand	Voice recognition technology is provided to customers in the Clifton Park Project	Clifton Park residents will reduce demand by shutting off certain appliances in the home in response to emails, texts, or other prompts when prices are high.
Price Signals: Customers enrolled in the residential VTOU rate and who have voice recognition technology available will achieve bill savings	A customer enrolls in the residential VTOU rate and has enabled voice recognition technology available	Customer will reduce load by turning off appliances during super-peak periods when bill prices are higher.

Price Signals: Clifton Park customers who participate in the PTR program will more readily reduce demand with enabled voice recognition technology	A Clifton Park resident has voice recognition technology enabled and receives notification of a peak time event from the Company	The Clifton Park resident will reduce demand by turning off appliances.
Customer Engagement: Timely, customized communications and information will enable Clifton Park residents to make energy choices that align with REV principles	National Grid provides Clifton Park residents who enroll in the residential VTOU rate with voice recognition technology	Clifton Park residents will make informed and engaged energy choices resulting in greater satisfaction from lower bills.

REV Demonstration Principles Addressed

National Grid anticipates that the addition of voice recognition technology to the Project will enhance the Project as a SHR by meeting the following SHR criteria:

- **Third Party Partners:** The Company will partner with a provider of voice recognition technology through a competitive bid process for Clifton Park residents.
- Advance the early adoption of sophisticated home energy management technologies – the voice recognition technology to be adopted in Clifton Park will provide further tools for the customer to enable demand response, unbundle price signals to incentivize different types of DER and energy management responses; combining the voice recognition technology with price signals from the residential VTOU rate and the PTR program will provide appropriate incentives to customers to reduce demand.

MARKET ATTRACTIVENESS

The addition of voice recognition technology to the Clifton Park Project offers a unique value proposition to customers, the community, Project partners, and National Grid:

- **Customers:** Customers will be offered an engaging technology experience that will both educate them on their energy usage and provide a direct correlation to high price signals and reduce demand by turning off appliances. Customers will benefit from this technology by more readily taking advantage of energy savings offered through the residential VTOU rate and the PTR program.

- Community: The community can further reach their energy goals and enable education and engagement from customers on energy issues.
- Partners: The Company will engage third-party providers of voice recognition technology, offering an opportunity for these providers to increase sales of their product and energize the market
- National Grid: The Company will benefit from the reduction of peak demand on the electric distribution system and potentially reducing or postponing future infrastructure investments.

CUSTOMER SEGMENTATION AND DEMOGRAPHICS

Channels

National Grid will provide voice recognition technology to customers in the Clifton Park Project who voluntarily enroll in the residential VTOU rate. The Company is already planning outreach and education to promote the residential VTOU in the Project implementation plan. Customers who enroll in residential VTOU will have the voice recognition technology available to them to further incent their demand response participation and will make demand response much more convenient. These customers will also be able to participate in PTR events and use the voice recognition technology for participating in demand reduction to called events.

The Company uses various outreach channels to reach customers who participate in the Dynamic Load Management Programs. Think Eco and Weather Bug Home (now Whisker Labs), our vendor partners, and reach customers through various communication channels, including Facebook, Twitter, texting, e-mail, and door-to-door engagement. Those same channels will be used to reach customers participating in Clifton Park to ensure they understand how to set up, use, and optimize the voice recognition technology to their benefit.

Scalability

National Grid will take into consideration the cost of the voice recognition technology, ease and cost of implementation, evaluation of customers' response, and evaluation of overall peak demand response to better understand if the voice recognition technology could be made available on a system-wide basis and whether customers would be expected to pay for this technology or if some arrangement for payment of the device could be offered. The Company's residential VTOU rate is available across the service territory to any residential customer, which

offers a benefit to customers who can use voice recognition technology to respond to high price signals.

DEMONSTRATION PLAN

Metrics for Success

The following will be used to assess the value derived from the Project:

Technology:

- Adoption rate of voice recognition technology via enrollment in the residential VTOU rate.

Price Signals:

- Comparison of customer participation and demand reductions in peak time rewards events for Clifton Park residential VTOU customers with voice recognition technology versus Clifton Park residents not on the residential VTOU rate and without voice recognition technology.
- Comparison of customer demands during the super peak periods, and the on peak periods of the residential VTOU rate, for Clifton Park customers both on the residential VTOU rate with voice recognition and those not on the rate.

Third-Party Services:

- Identify third party resources available through the response to the Company's request for proposal for voice recognition technology for use in demand response at Clifton Park
- Increased customer adoption rate of residential VTOU rate due to availability of voice recognition technology

Customer Engagement:

- Increased customer satisfaction due to availability of voice recognition technology

Timelines, Milestones, and Data Collection

A preliminary timeline is provided below for inclusion of voice recognition technology in the Clifton Park Project. All dates below assume approval of the inclusion of voice recognition technology in the Clifton Park Project as a SHR demo by April 1, 2017:

- National Grid issue of Request for Proposal to engage third party provide of voice recognition technology by May 15, 2017
- Selection of third-party vendor by July 15, 2017
- Availability of voice recognition technology for installation by September 1, 2017
- Customer outreach and education will be incorporated into the Clifton Park Project outreach plan

Conditions / Barriers

National Grid has and will continue to reach out to potential suppliers of this technology to partner with in the Clifton Park Project and will engage a supplier via competitive bid.

FINANCIAL ELEMENTS / REVENUE MODEL

Expense and Revenue Budgets

The estimates below are a range of budget costs using an assumption of 5% of enrollments in the residential VTOU rate by Project participants on the low end (*i.e.*, 500 customers) and an assumption of 15% of enrollments on the high end (*i.e.*, 1,500 customers). All customers who enroll in the residential VTOU rate will be provided with the voice recognition technology.

Cost Category	Per Unit Estimate	Low Estimate	High Estimate
Expense – VR Unit	\$180	\$90,000	\$270,000
Expense – Compatible T’Stat ⁹	\$150	\$75,000	\$225,000
Customer Engagement		\$200,000	\$300,000
Total		\$365,000	\$795,000

National Grid proposes to recover these costs in the same manner as the costs associated with the Clifton Park Project, but all costs identified above for the addition of the voice recognition technology should be approved as incremental costs to the Clifton Park Project budget estimates within the Project Implementation Plan.

REPORTING

Information to be Included in Quarterly Reports to the Commission

National Grid proposes to include reporting of the voice recognition technology component within the Company’s quarterly reports to the Commission on the Clifton Park Project. The quarterly reports will include an overview of the progress of including voice recognition technology in the Clifton Park Project against the timeline/plan and results as they become available.

CONCLUSION

While the Clifton Park Project has many elements that support a SHR pilot, it will further benefit by the inclusion of voice recognition technology as a tool to enable customers to more fully respond to and participate in the Company’s residential TOU rate and PTR programs offered in the Project. This technology will promote a behavioral response by customers to reduce demand following real-time information via text or email and allow them to conveniently turn down or turn off devices in the home to reduce demand and provide utility bill savings.

The addition of voice recognition technology will also provide the opportunity for the Company to partner with a third party vendor and test exciting, new technology that is not yet prominent in

⁹ T-stat must be compatible with ConnectedSolutions program

the home. This will provide a necessary conduit between price signals from the Company's offered rate programs in the Project and a customer's ability and desire to respond.



May 24, 2017

VIA ELECTRONIC DELIVERY

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

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

**NATIONAL GRID DISTRIBUTED GENERATION INTERCONNECTION
REV DEMONSTRATION PROJECT – IMPLEMENTATION PLAN**

Dear Secretary Burgess:

Niagara Mohawk Power Corporation d/b/a National Grid (“Company”) submits for filing the Distributed Generation Interconnection REV Demonstration Project (the “Project”) Implementation Plan as required by the Department of Public Service Staff’s (“Staff”) April 24, 2017 letter approving the Project with modifications.

Please direct any questions regarding this filing to:

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Director, Asset Management
National Grid
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Albany, NY 12204
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Email: allen.chieco@nationalgrid.com

The Company looks forward to continuing to work collaboratively with Staff as it proceeds with the implementation of the Project.

Respectfully submitted,

Allen C. Chieco

Allen C. Chieco
Director, Asset Management
National Grid

Enc.

Hon. Kathleen H. Burgess, Secretary
National Grid DG Interconnection REV
Demonstration Project
May 24, 2017
Page 2

cc: Tammy Mitchell, DPS Staff, w/enclosure (via electronic mail)
Michael Worden, DPS Staff, w/enclosure (via electronic mail)
Denise Gerbsch, DPS Staff, w/enclosure (via electronic mail)
Christian Bonvin, DPS Staff, w/ enclosure (via electronic mail)
Marco Padula, DPS Staff, w/ enclosure (via electronic mail)



**Implementation Plan Distributed Generation
Interconnection
REV Demonstration Project**

**Case 14-M-0101
Reforming the Energy Vision**

Niagara Mohawk Power Corporation d/b/a National Grid

May 24, 2017

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Executive Summary

On February 14, 2017, Niagara Mohawk Power Corporation d/b/a National Grid (“NMPC” or the “Company”) filed a proposal for the Distributed Generation Interconnection REV Demonstration Project (the “Project”) in Case 14-M-0101.¹ The Project is designed to test alternative solutions for increasing the pace and scale of interconnecting distributed generation (“DG”) systems above 50 kW through upfront investments by the Company coupled with a cost-allocation methodology aimed at removing barriers for DG interconnection applicants. By letter dated April 24, 2017, New York State Department of Public Service Staff (“DPS Staff”) directed the Company to file an implementation plan. The purpose of this implementation plan (the “Implementation Plan”) is to describe NMPC’s execution plan and the core team supporting the Project.

For the Project, the Company will upgrade equipment at the Peterboro and East Golah substations (the “Demonstration Areas”) by installing 3V₀ ground fault protection. These upgrades will effectively make the system “DG-ready,” capable of interconnecting current, as well as future, DG projects in the respective Demonstration Areas. To recoup the investment costs, NMPC will charge a pro-rated fee to all applicants (not just the first applicant) with DG systems above 50 kW who connect to the upgraded substation transformer banks in the Demonstration Areas. For accounting purposes, the Company will place the costs of the common-system upgrades as well as fees received from DG applicants in a regulatory asset. To the extent the fees do not equal the costs, the Company will recover or pass back the residual balance in the regulatory asset in a future proceeding.

Design and engineering work is underway with construction anticipated to be completed by December 2017. From the end of common-system upgrade construction, the Project will continue for six months. During that time, the Company will use the Project to test:

- Assumptions that DG developers will respond to shorter construction timelines and known costs;
- Whether upfront investment with post-upgrade cost recovery is a feasible mechanism for DG applicants and the Company; and
- Methods for effectively marketing capacity to DG developers seeking to interconnect with the Company’s system.

¹ Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* (“REV Proceeding”), “Proposed Distributed Generation Interconnection REV Demonstration Project” (filed February 14, 2017).

Project Design

Standard Station Upgrade Process

There are two types of distribution system upgrades that may be required before a DG project can be interconnected: common-system upgrades and site-specific upgrades. Site-specific upgrades benefit a single applicant, whether located on private property or in the public way (*e.g.*, new poles, meters, or switches at an applicant's facility). Common-system upgrades provide support to an area of the Company's electric power system and can benefit multiple interconnection customers (*e.g.*, high-side transmission ground fault overvoltage protection equipment, known as $3V_0$ protection, transformer load tap changer, and other substation upgrades) because the upgrades, once made, often allow additional customers to interconnect to the distribution system. The Project addresses common-system upgrade costs for $3V_0$ protection.

Currently, the DG applicant whose proposed service would result in the need for the Company to upgrade its system is responsible for 100 percent of the common-system upgrade costs.² Subsequent DG applicants who benefit from the common-system upgrades reimburse the earlier applicant who paid the upgrade costs.³ The Commission and DG applicants have indicated that common-system upgrade costs create economic barriers to siting more DG projects.⁴ Even with the new cost-allocation mechanism recently adopted by the Commission,⁵ the timing and uncertainty of reimbursement likely remains a difficult hurdle for developers to overcome, as does the fact that the initial applicant still has to pay the total upfront costs for its project to move forward. Recognizing that other cost allocation methodologies may exist, the SIR Queue Management and Cost Allocation Order indicated that stakeholders may propose alternatives to the current cost allocation mechanism.⁶ This Project seeks to test an alternative method to attract more DG projects in the Company's service territory.

² Standardized Interconnection Requirements (issued February 2017) ("SIR"), Appendix E ("[T]he first project triggering an eligible upgrade will initially bear 100% of the cost, while subsequent projects benefitting from those upgrade [sic] will reimburse the first project developer").

³ SIR, Appendix E.

⁴ See Case 16-E-0560, *Joint Petition for Modifications to the New York State Standardized Interconnection Requirements and Application Process for New Distributed Generators 5 MW or Less Connected in Parallel with Utility Distribution Systems* (the "SIR Queue Management and Cost Allocation Proceeding"), Order Adopting Interconnection Management Plan and Cost Allocation Mechanism, and Making Other Findings (issued January 25, 2017) (the "SIR Queue Management and Cost Allocation Order"), p. 29; *see generally*, Case 16-E-0560, the Queue Management and Cost Allocation Proceeding, Comments of SolarCity Corporation on the Petition of the Interconnection Policy Working Group (December 5, 2016), p. 3 ("SolarCity Cost Allocation Comments") ("As the Commission is aware, there are two major factors causing the queue backlog problem – uneconomic barriers to entry and extreme delays in the interconnection process.").

⁵ SIR, Appendix E.

⁶ See SIR Queue Management and Cost Allocation Order, p. 29.

Project Component Details

NMPC proposes to upgrade the distribution system in the Demonstration Areas, making the Peterboro and East Golah substations ready for future DG applicants to interconnect. The investment will include the installation of 3V₀ protection at four transformer banks: two at the Peterboro substation and two at the East Golah substation. These 3V₀ installations are considered to be common-system upgrades, enabling DG applicants to interconnect to the upgraded substations, essentially making the substation transformer banks “DG-ready.” To recover its costs, National Grid will charge a pro-rated fee to all applicants (not just the first applicant) with DG systems above 50 kW who connect to the upgraded substation transformer banks in the Demonstration Areas.

The Project will test the concept: if the Company builds 3V₀ protection where needed to enhance capacity, will DG developers come to these stations to build and interconnect their projects? Moreover, once built, does the proposed cost-allocation mechanism provide greater certainty and lower financing costs for developers than has traditionally been available for such projects? Finally, is the Company able to market the available capacity and recoup its investment at the upgraded sites? More specifically, these three concepts include the following elements:

1. **Pre-build 3V₀ Protection** – As part of the Project, NMPC will pre-build 3V₀ protection at four substation banks. The Company estimates it will take three months per substation bank to design and engineer the 3V₀ protection. For the Peterboro substation, design and engineering is underway. Based on that early work, the Company adjusted the completion date by a month to accommodate design changes that will save approximately \$50,000 and two weeks of construction time. With those changes, the Company anticipates completing the Peterboro substation upgrade design by the end of July. The Company has also started design and engineering work for the East Golah substation, and anticipates completing that work by the end of August. Once the design and engineering is complete, NMPC expects construction at the four substation banks to finish by the end of December 2017 (subject to the availability of mobile substations and/or outages). The term of the Project will be six months from the date the common system upgrades are completed in each of the respective Demonstration Areas.
2. **Cost Mechanism** - To recover the common-system upgrade costs, NMPC will charge a one-time pro-rated fee to each applicant with DG systems above 50 kW that interconnects its DG project in the Demonstration Areas. The fee will be based on the estimated common-system upgrade costs (subject to true up once actual costs are known) in each of the respective Demonstration Areas divided by a factor that represents the substation transformer bank’s capacity. An illustrative example of how the fee will be calculated is included in Appendix 1 to the Company’s February 14, 2017. In the case of the Peterboro and East Golah substations, the factor is assumed to be 80 percent of the smaller of the respective substation transformer bank’s capacity at the highest bank rating. This assumption ensures that each bank is protected in case of a bank failure or outage by enabling the Company to restore customers fed by the substation during the bank outage using the second substation bank as originally designed. This also allows for up to 20 percent of the respective substation transformer bank’s capacity to be used by DG projects of 50 kW or less (free of charge), which are primarily residential and small

commercial projects. The total common-system upgrade costs would be recovered from those applicants with DG systems above 50 kW in the Demonstration Areas. For the Project to be successful, the Company's cost-allocation methodology should be utilized in the Demonstration Areas.

3. **Utility Marketing of Capacity** – The Company's Customer Energy Integration ("CEI") department will proactively seek participants for the Project. CEI provides DG customers a single point of contact to assist in navigating the interconnection process, and it regularly conducts outreach sessions to educate potential and existing DG applicants on topical DG issues. Marketing initiatives associated with the Project include:

- CEI will email over 700 DG installers and developers in its database, notifying them of the Project and inviting them to a webinar to learn more;
- An initial webinar on a date to be determined and subsequent monthly webinars (as needed) based on interest and participation/enrollment in the Project;
- CEI will have direct conversations with developers to explain the Project, gauge interest and facilitate participation accordingly;
- CEI will post a link to the Project filing, participation information and webinar logistics on its DG website;
- A potential joint effort with the New York State Energy Research and Development Authority ("NYSERDA") to assist in marketing the Project in the Demonstration Areas; and
- A one-page handout with the Project's highlights, including substation location and an explanation of cost-allocation methodologies.

These activities mark a shift from traditional DG interconnection requests, where developers or customers typically initiate the interconnection request with the Company. This proactive Company-led effort will be supported by existing personnel, and the Project marketing expenses are projected to be *de minimus* at this point.

Billing

For the DG applicant to receive credits upon interconnection and for witness testing once permission to operate is granted, the Company must set the appropriate metering. Additionally, the Company must adjust billing for DG applicants based on the specifics of their respective projects. The Company is currently working to implement a system change to automate this process. By the time interconnections begin under this Project, the automated system should be operational.

"Go/No-Go" Test

The Company will proceed with the installation of the $3V_0$ protection in the Demonstration Areas to ensure internal processes are appropriate and to develop actual timelines for delivering the protection in the field. At the conclusion of the existing queue management and marketing effort, the Company will determine whether to undertake further marketing in the Demonstration Areas for this Project.

Infrastructure

NMPC will install the required site-specific materials for $3V_0$ protection at the four Peterboro and East Golah substation banks. The modifications are required to prepare the substations for reverse power flows and transmission line ground-fault protection from anticipated source additions. To accomplish this, the Company will install $3V_0$ protection relays, associated voltage transformers, relay racking and associated hardware, foundations, support structures, grounding, and 115 kV bus modifications. In addition to these upgrades, NMPC will upgrade the load tap changer (“LTC”) controllers to handle reverse power flow and allow for proper voltage regulation. Communications processors and ancillary control and integration equipment will also be installed to aid in protection event recording and monitoring system conditions.

The Company estimates \$850,146 in total costs (including taxes) at the Peterboro substation. The estimated cost for each Peterboro bank is as follows: transformer bank (“TB”) 1 is the smaller of the two banks which is utilized in this calculation in case there is a loss of the larger bank. If a loss of TB2 occurs, TB1 is sized appropriately at its highest rating of 25MVA to support the generation on TB1 without damaging TB1 (assume further that 1 MVA equals 1 MW). The capacity to utilize the bank for DG is determined by 80 percent of the 25MVA, or 20MVA to be utilized by both banks. TB1 is 38 percent (7.7MW) of the overall station capacity and TB2 is 62 percent (12.4MW). The cost for each bank is then divided by 2. The cost per kW is then calculated by dividing the bank cost by bank MW capacity calculated to determine cost per kW, including taxes. The cost to upgrade TB1 is \$55.26/kW and TB2 is \$34.54/kW.

For East Golah, the Company estimates \$731,206 in total costs (including taxes). As mentioned, 80 percent of the rating of the East Golah substation transformer would be used as the base kW value (allowing 20 percent to be used by residential and small commercial projects). The rating of the smallest East Golah substation transformer bank two is 25 MVA (assume further that 1 MVA equals 1 MW). TB1 is 57 percent (11.4MW) of station capacity and TB2 is 43 percent (8.6MW) of capacity. The cost estimate for TB1 is \$32.13/kW and TB2 is \$42.41/kW, including taxes. The overall cost for the substation upgrades is divided by two for the calculations as with the Peterboro example.

These numbers are revised from the illustrative estimates in the Company’s February 14, 2017 filing to account for the addition of a fourth substation bank. Company crews will complete the electrical construction work at the substations.

Metrics for Success

The Company will measure the success of the Project by the extent to which the pace and scale of interconnections are increased in the Demonstration Areas. As the Project progresses, the Company will notify DG developers of the upgrades to the Peterboro and East Golah substation banks and solicit DG interconnection applications in the Demonstration Areas. The Company will solicit feedback from DG developers during the initial and late stages of the Project. This will include a survey of DG applicants who participated in the Project, as well as those who opted not to pursue interconnections in the Demonstration Areas. This feedback will help the Company identify lessons learned and incorporate suggestions for improvement, where

appropriate, into future offerings. The Company will also share its experience and opportunities for improvement with the Interconnection Policy Working Group (“IPWG”) to use in proposing refinements and improvements to the interconnection process and the current cost-allocation mechanism.

Because the success of the Project is dependent on use of the Company’s proposed cost-allocation methodology, the Company will actively market the circuits with solar developers. Interconnections are allowed to utilize the SIR process, outside of the Company’s cost allocation method, if desired. If a developer chooses to utilize the existing cost mechanism in the SIR rather than the Company’s cost allocation mechanism, the Project will be determined a failure in regards to cost recovery.

DG applicants in the Demonstration Areas would still bear full responsibility for their respective site-specific and any other distribution line upgrade costs that are outside of the common system upgrade charge under this Project. The pro-rated common system upgrade fee would be due at the same time as payment of site-specific and any other distribution line upgrade costs.

Participation

NMPC proposes a targeted site selection process as part of the Project, focusing on the two substations mentioned above: Peterboro and East Golah. DG applicants will be able to participate in the Project if the applicant:

- Has a DG project above 50 kW in the Demonstration Areas (applicants are not allowed to break up their projects to avoid paying the common upgrade costs);
- Executes an interconnection agreement and pays its share of the common-system upgrade costs as determined by the Company’s methodology or the existing Queue Management cost sharing methodology; and
- Complies with all other existing interconnection requirements, such as payment of site-specific and any other distribution line upgrade costs that are outside of the common-system upgrade charge under the Project.

Outreach

The Company discussed the Project at the April 18th IPWG meeting and the Company intends to pursue the aforementioned marketing strategy through its CEI department – targeted contact with DG developers, webinars, and website updates. The Company also intends to continue answering questions and soliciting feedback to inform potential future offerings by participating in the IPWG, the Interconnection Technical Working Group, the DG Ombudsman Group, and maintaining its own internally driven stakeholder outreach. In addition, the Company will provide updates to Staff on the results of its efforts. So far, initial feedback from DG developers has been very positive.

Test Statements

The Company will test the validity of the prebuild 3V₀ concept as shown below. The results of the testing will be tracked and documented and then used to inform and modify any subsequent programs where applicable.

Test Statement	If...	Then...
Prebuilt 3V ₀ system upgrades will lead to increased DG interconnections in the Demonstration Areas.	<p>A. NMPC prebuilds 3V₀ protection at selected station banks;</p> <p>B. The Company's cost-allocation mechanism allows greater certainty and less upfront cash payment for DG developers;</p> <p>C. Provides the Company with acceptable cost recovery.</p>	Developers will look to build at these sites as defined by participation and/or queue increase and utilities will continue to scale this approach in future filings.
Can a utility effectively market capacity to solar developers for DG interconnection without additional price reductions?	NMPC markets interconnections in the Demonstration Areas using the proposed cost-allocation mechanism.	Developers will be aware of the opportunity and seek to interconnect DG projects.

Test Population

The population of developers currently active in New York State with the Company exceeds 85. Prior to the queue management process, the Company had upwards of 700 DG projects ongoing at some point in the process. The Company believes DG developers doing work in New York State comprise the general universe of companies that will consider interconnecting DG systems above 50 kW in the Demonstration Areas. Specifically, the Demonstration Areas target two substations, Peterboro and East Golah, where the Company anticipates significant DG interconnection interest. Both substations are located in areas where applicants had proposed a number of DG projects and where the Company can quickly deploy and test the efficacy of its proposal. The Peterboro substation is located in the Utica/Rome region near the Town of Lenox. It serves approximately 8,000 customers using one transmission supply line and eight distribution feeders. There is now one DG application in the queue for projects in the area served by the Peterboro substation at approximately 2 MW. The East Golah substation is located south of the City of Rochester, near the Town of Rush. It serves approximately 7,500 customers using a looped transmission supply line and six distribution feeders. There are five DG applications in the queue sized at approximately 2 MW each. The queue has decreased significantly in these areas with developers removing projects from the interconnection process with the implementation of the Queue Management Order. The Company will continue with 3V₀ build out at these substations to test the cost mechanism and prebuild concept.

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. The Company envisions that the Project will enable a live “market test” of the concepts outlined in this Implementation Plan by allowing DG developers to compare prebuilt capacity and known costs to the existing process with frontloaded costs and uncertainty. Based on the foregoing, the Company will be able to analyze whether prebuilt common-system upgrades increase the pace and scale of DG projects applying to and ultimately interconnecting with NMPC’s system.

Milestones and Checkpoints

The term of the Project is six months, beginning from the date the common-system upgrades are completed in each of the respective Demonstration Areas. As this Implementation Plan is an evolving, working document, refinements to the scope of work for Company personnel are expected throughout the course of the Project. The Company will capture modifications in quarterly reports, as well as through meetings with PSC Staff. Demonstration evaluators should be able to review the Project results, including the following milestones:

General Project Milestones	
Date	Milestone
March 2017	Begin general outreach
April 2017	Provide funding numbers
	Begin marketing the Project
	Begin site-specific outreach with developers
May 2017	Order long-term materials
	Develop cost per KW for each bank
June 2018	The Project term ends
Peterboro Substation Milestones	
Date	Milestone
February 2017	Complete initial cost estimate
July 2017	Complete 3V ₀ design and engineering
	Determine needs for switching and/or mobile sub
September 2017	Schedule civil work
	Schedule electrical work
	Schedule relay work
December 2017	Anticipated completion date
June 2018	The Project term ends
East Golah Substation Milestones	
Date	Milestone
February 2017	Complete initial cost element
June 2017	Determine needs for switching and/or mobile sub
August 2017	Complete 3V ₀ design and engineering
	Schedule civil work
	Schedule electrical work
	Schedule relay work

December 2017	Anticipated completion date
June 2018	The Project term ends

Project Milestones	
Checkpoint	Description
Effectiveness of Marketing Capacity	<p>Measure – Amount of kW in respect to capacity at each location to the amount required to equal 80 percent of bank capacity as calculated per substation.</p> <p>How & When – Update by CEI on the last day of each month on status. Continue until a Go/No-Go decision is made with regard to marketing efforts.</p> <p>Resource – CEI</p> <p>Expected Target – Sign up 80 percent of defined bank capacity at each location. Review monthly to see action/increase in queue.</p>
Completion of Final Plan	<p>Measure – Final Go/No-Go determination for completion or continuation of marketing services.</p> <p>How & When – Review six months after completion of construction, or as determined based on lessons learned and market behavior.</p> <p>Resources – CEI</p> <p>Expected Target – Positive decision to proceed (<i>i.e.</i>, “Go”).</p> <p>Strategy in Case of Results Below Expectations – Suspend the Project, utilize existing SIR cost-allocation methodology to manage future additional interconnections as requested by DG applicants.</p>

Scalability

This Demonstration Project is highly scalable. As discussed in the Company’s February 14, 2017 filing, NMPC’s recent rate filing included a similar proposal for up to six banks per rate year.

Conditions/Barriers

As stated earlier, the barriers to increased interconnections are the cost to interconnect and the uncertainty regarding how common upgrade costs will be recovered from subsequent DG applicants. Further, because the Company typically has to perform a Coordinated Electric System Interconnection Review (“CESIR”) every time a DG developer seeks to interconnect with the system, such projects can incur further delays and costs. For NMPC and its customers, the value

of the Project is tied to reducing these barriers, thereby increasing access to DG. This, in turn, will create a more transactive grid, improve system resilience, and increase system efficiency.

Project Structure and Governance

Executive Sponsorship

The Company has assigned an executive sponsor for each of its REV Demonstration Projects, recognizing that active sponsorship is a critical factor for successful project management. Executive sponsor responsibilities include:

- Accountability for the ultimate success of the Project;
- Vision and leadership throughout the Project;
- Time commitment and active engagement throughout the Project, and
- Addresses conflicts and ensures senior stakeholders are engaged and supportive.

The executive sponsor for the Project is Carol Sedewitz, Vice President (“VP”) Electric Asset Management, Executive Sponsor.

Core Project Team

Name	Title	Contact Information
Carol Sedewitz	VP Electric Asset Management, Executive Sponsor	Tel.: 781-907-2500 Email: carol.sedewitz@nationalgrid.com
Allen Chieco	Director DG Liaison, Ombudsman	Tel.: 518-433-3809 Email: allen.chieco@nationalgrid.com
Phillip Foster	Project Manager	Tel.: 315-428-6169 Email: Phillip.foster@nationalgrid.com
James Molloy	Regulatory	Tel.: 781-907-1817 Email: james.molloy@nationalgrid.com
Patric O’Brien	Legal, Regulatory	Tel.: 781-907-1850 Email: patric.r.obrien@nationalgrid.com
Neil Labrake	Director Retail Connections, Policy and Standards	Tel.: 315-428-6779 Email: neil.labrake-jr@nationalgrid.com
Melanie Littlejohn	VP Community and Customer, NY Jurisdiction	Tel.: 315-452-7660 Email: melanie.littlejohn@nationalgrid.com
Sue Martuscello	Director Substation Engineering, Engineering Lead	Tel.: 315-428-5606 Email: susan.martuscello@nationalgrid.com
John Burke	Director Stations, NY	Tel.: 716-831-7576 Email: john.burke@nationalgrid.com
Michael Pilawa	Manager Customer	Tel.: 315-798-5367

	Energy Integration ("CEI") NY	Email:michael.pilawa@nationalgrid.com
Kevin Kelly	Director Customer Energy Integration	Tel.: 978-725-1325 Email:kevin.kelly@nationalgrid.com

Project governance will include the Core Project Team (as set forth above) and will consist of monthly conference calls and in-person meetings (as needed) at milestone points to report on project schedule, identified risks, project status, and the projected costs and benefits of services under development.

Internal Stakeholders

There are various departments within the Company that are critical to the delivery of the Project. They include:

- Station Engineering
- Protection Engineering
- Distribution Planning and Asset Management ("DPAM")
- Contracting (civil)
- Field Operations
 - Stations
 - PTO
- CEI
- Regional Control Centers ("RCC")
- New York Jurisdiction
- Billing
- New Energy Solutions ("NES")

Roles and Responsibilities

Roles and responsibilities below are for key Project responsibilities. Note that the roles and responsibilities in this document focus on the Project, and do not fully detail related activities.

Role/Responsibility – National Grid	Description
Support conceptual and detail design	Provide necessary data and expertise for the design work
Set up 3V0 demonstration project PMO	Create PMO to assist with coordination of REV demonstration
Initial stakeholder outreach	Present demonstration objectives and receive feedback on the project
Develop estimate per kw	Determine proper technical and pricing methodology
Define & implement marketing plan	Develop a marketing plan, staffing, budget, and objectives
Order materials	Provide materials to build project

Field construction	Safely construct all civil and electrical apparatus to the transformer bank
System configuration and switching	Determine outage availability and need for mobiles
Municipal customer outreach	Opportunity for company to provide outreach to municipalities in area on demonstration
Billing	To properly change/develop appropriate billing accounts in project
Interconnection	To provide all required interconnection obligations to customers in regards to the interconnection process

Roles/Responsibility – Developer/Customer	Description
Provide proper applications and process participation	Completion of a timely interconnection process
Development in the demonstration area	Participate in demonstration

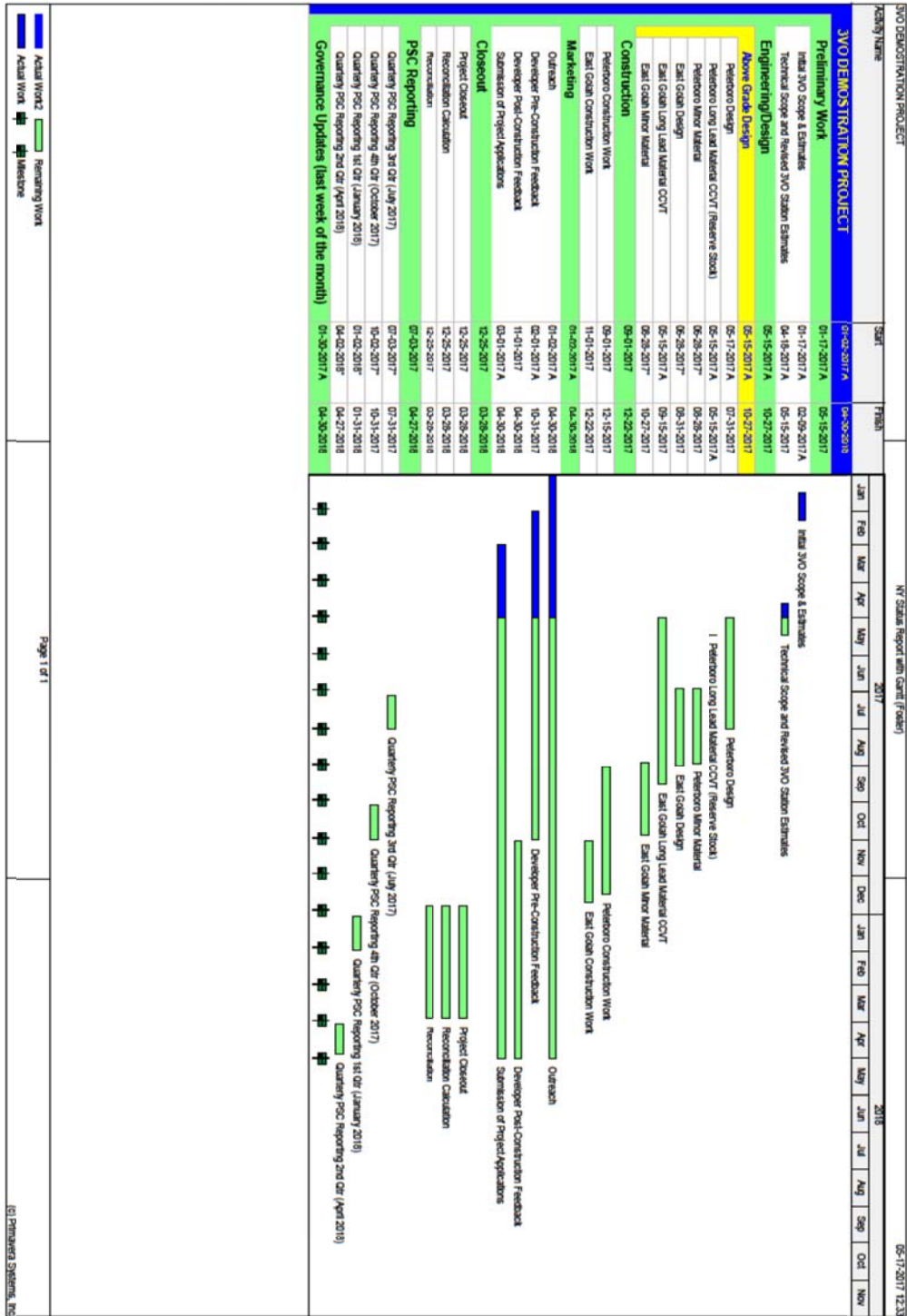
Department of Public Service Staff, Public Service Commission Role / Responsibility	Description
Provide feedback on quarterly reports for Project	Review progress against Project objectives and recommend any corrective actions

Governance

The governance structure for the Project will include the Core Project Team (as set forth above) and will consist of monthly conference calls and in-person meetings at milestone points to report on the Project's status, schedule, risks, lessons learned, as well as projected costs and benefits.



Work Plan



Financial Elements/Revenue Model

Project Budget

The Company estimates its initial upfront cost to design, engineer, and construct the common-system upgrades will be \$1,581,351 (excluding *de minimus* marketing costs). The preliminary two-year budget with estimated costs for the Project broken down by year is summarized below:

Expense Type	2017	2018
Engineering & Material Procurement	\$690,900	
Construction	\$546,200	
Marketing	\$12,000	\$8,000
In Service Liabilities & Closeout	\$188,700	\$40,000
Total⁷	\$1,437,800	\$48,000

The Project consists primarily of engineering, material, marketing, and construction costs.

Cost Recovery/Incentives

As part of the Project, the Company is seeking to recoup investment costs from developers who interconnect DG systems above 50 kW in the Demonstration Areas. The costs of the common system upgrades would be placed in a regulatory asset and recovered through a fee charged to DG applicants (described above). To the extent the fees do not equal the costs, the Company will recover or pass back the net balance in the regulatory asset in a future proceeding. There will be no additional incentives to participate, as the objective of the Project is to determine if DG developers will seek to interconnect in areas with prebuilt capacity and reduced cost uncertainty.

Reporting Structure

The Company will provide quarterly progress reports to Staff. The quarterly reports will include an overview of the Project's progress relative to the timeline set forth in this Implementation Plan, as well as Project results as they become available. The quarterly report template is provided below – the Company will continue to refine the template throughout the duration of the Project.

⁷ The total does not include sales taxes.

Quarterly Report Template	
Milestones:	
Last Project Milestone:	
Next Project Milestone:	
Tasks/Timeline:	
Completed Project Tasks Since Last Quarterly Report:	
Changes or Impacts to Schedule Since Last Quarterly Report:	
Lessons Learned:	
Work Stream Coordination:	
Risks:	
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):	
Queue Status Update:	
Additional Notes:	

Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238 & 17-G-0239
Attachment 4 to DPS-325 RAC-3
Question 5
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Remaining Balance of Cap Compared to Revenue Requirement of REV Demonstration Projects

REV Demonstration Project Expenditures	Cost Type	FY16	FY17	FY18	FY19	FY20	FY21
Neighborhood Solar (Fruit Belt)	Capital	\$ -	\$ 49,993	\$ 1,987,004			
	O&M	\$ -	\$ 142,670	\$ 241,350			
	Total	\$ -	\$ 192,663	\$ 2,228,354	\$ -	\$ -	\$ -
Demand Reduction (Clifton Park)	Capital	\$ -	\$ 3,301,238	\$ 6,853,072			
	O&M	\$ -	\$ 889,243	\$ 2,751,125			
	Total	\$ -	\$ 4,190,481	\$ 9,604,197	\$ -	\$ -	\$ -
Community Resilience - Potsdam	Capital	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	O&M	\$ 79,631	\$ 6,375	\$ 868,999	\$ -	\$ -	\$ -
	Total	\$ 79,631	\$ 6,375	\$ 868,999	\$ -	\$ -	\$ -
Distributed System Platform (DSP)	Capital	\$ -	\$ 488,977	\$ 2,908,201			
	O&M	\$ -	\$ 6,375	\$ -			
	Total	\$ -	\$ 495,352	\$ 2,908,201	\$ -	\$ -	\$ -
Smart Home Rate Project	Capital	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	Total	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
Grand Total	Total Capital	\$ -	\$ 3,840,208	\$ 11,748,277	\$ -	\$ -	\$ -
	Total O&M	\$ 79,631	\$ 1,044,663	\$ 4,258,974	\$ 298,125	\$ 99,375	\$ -
	Grand Total	\$ 79,631	\$ 4,884,871	\$ 16,007,251	\$ 298,125	\$ 99,375	\$ -

Estimated Revenue Requirement (see notes for assumptions)	FY16	FY17	FY18	FY19	FY20	FY21	
Capital - Annual	\$ -	\$ 49,993	\$ 1,987,004				
Capital - Cumulative	\$ -	\$ 49,993	\$ 2,036,997				
Depreciation Reserve	\$ -	\$ (569)	\$ (24,877)				
Net Book Value	\$ -	\$ 49,424	\$ 2,012,120				
Tax Bonus Depr Rate		50%	40%				
Tax Bonus Depreciation	\$ -	\$ 24,997	\$ 794,802				
Tax 5 Yr. MACRS Depreciation	\$ -	\$ 4,999	\$ 246,439				
Total Tax Depreciation	\$ -	\$ 29,996	\$ 1,041,241				
Diff Book Tax Depr	\$ -	\$ (28,858)	\$ (1,022,620)				
Tax Rate	40%	40%	40%				
ADIT	\$ -	\$ (11,543)	\$ (409,048)				
Rate Base	\$ -	\$ 37,881	\$ 1,603,072				
Pre-tax WACC	9.79%	9.79%	9.79%				
Return on Ratebase	\$ -	\$ 1,854	\$ 78,463				
Book Depreciation Rate	4.55%	4.55%	4.55%				
Book Depreciation	\$ -	\$ 1,137	\$ 47,479				
O&M	\$ -	\$ 142,670	\$ 241,350				
Total Revenue Requirement	\$ -	\$ 145,661	\$ 367,292				
				Included in Base Rates			
Neighborhood Solar (Fruit Belt)	Capital - Annual	\$ -	\$ 3,301,238	\$ 6,853,072			
	Capital - Cumulative	\$ -	\$ 3,301,238	\$ 10,154,310			
	Depreciation Reserve	\$ -	\$ (51,582)	\$ (313,407)			
	Net Book Value	\$ -	\$ 3,249,656	\$ 9,840,903			
	Tax Bonus Depr Rate		50%	40%			
	Tax Bonus Depreciation	\$ -	\$ 1,650,619	\$ 2,741,229			
	Tax 20 Yr. MACRS Depreciation	\$ -	\$ 61,898	\$ 273,352			
	Total Tax Depreciation	\$ -	\$ 1,712,517	\$ 3,014,581			
	Diff Book Tax Depr	\$ -	\$ (1,609,354)	\$ (4,203,449)			
	Tax Rate	40%	40%	40%			
	ADIT	\$ -	\$ (643,741)	\$ (1,681,379)			
	Rate Base	\$ -	\$ 2,605,915	\$ 8,159,524			
	Pre-tax WACC	9.79%	9.79%	9.79%			
	Return on Ratebase	\$ -	\$ 127,547	\$ 399,370			
	Book Depreciation Rate	6.25%	6.25%	6.25%			
Demand Reduction (Clifton Park) - All Electric	Book Depreciation	\$ -	\$ 103,164	\$ 420,486			
	O&M	\$ -	\$ 889,243	\$ 2,751,125			
	Total Revenue Requirement	\$ -	\$ 1,119,954	\$ 3,570,981			
				Included in Base Rates			
	O&M	\$ 79,631	\$ 6,375	\$ 868,999			
	Total Revenue Requirement	\$ 79,631	\$ 6,375	\$ 868,999			
				Included in Base Rates			
	Capital - Annual	\$ -	\$ 488,977	\$ 2,908,201			
	Capital - Cumulative	\$ -	\$ 488,977	\$ 3,397,178			
	Depreciation Reserve	\$ -	\$ (17,463)	\$ (173,718)			
	Net Book Value	\$ -	\$ 471,514	\$ 3,223,460			
	Tax Bonus Depr Rate		50%	40%			
	Tax Bonus Depreciation	\$ -	\$ 244,489	\$ 1,163,280			
	Tax 3 Yr. MACRS Depreciation	\$ -	\$ 81,488	\$ 690,257			
	Total Tax Depreciation	\$ -	\$ 325,977	\$ 1,853,538			
	Diff Book Tax Depr	\$ -	\$ (291,050)	\$ (1,867,005)			
Distributed System Platform (DSP)	Tax Rate	40%	40%	40%			
	ADIT	\$ -	\$ (116,420)	\$ (746,802)			
	Rate Base	\$ -	\$ 355,094	\$ 2,476,658			
	Pre-tax WACC	9.79%	9.79%	9.79%			
	Return on Ratebase	\$ -	\$ 17,380	\$ 121,221			
	Book Depreciation Rate	14.29%	14.29%	14.29%			
	Book Depreciation	\$ -	\$ 34,927	\$ 277,583			
	O&M	\$ -	\$ 6,375	\$ -			
	Total Revenue Requirement	\$ -	\$ 58,682	\$ 398,803			
				Included in Base Rates			
	O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
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	O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
	O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -
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Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -	
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Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -	
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Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -	
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Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -	
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Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -	
O&M	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -	
Total Revenue Requirement	\$ -	\$ -	\$ 397,500	\$ 298,125	\$ 99,375	\$ -	
O&M	\$ -	\$ -	\$ 397,500	\$ 298			

Date of Request: June 14, 2017
Due Date: June 26, 2017

Request No. DPS-353 RAC-6
NMPC Req. No. NM-832

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Robert Cully

TO: National Grid, Electric Customer Panel

SUBJECT: **DYNAMIC LOAD MANAGEMENT PROGRAM AND
DEMAND RESPONSE MANAGEMENT SYSTEM**

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

1. Explain how the Company developed its proposal for three FTEs to manage its Dynamic Load Management (DLM) programs.
2. Provide a detailed list of the work functions and responsibilities for the three FTEs that will manage the DLM programs.
 - a. Will the FTEs be dedicated solely to NMPC, or will these FTEs also support projects by other National Grid companies?
 - b. If the FTEs will be shared with other National Grid companies, provide the FTEs' allocation to NMPC.
3. Has the Company performed any benchmarking to compare its proposal for three FTEs to the number of FTEs employed in other utilities' DLM programs? If so, provide such analysis.
4. Provide the whitepaper and sanction paper for the Demand Response Management System (DRMS).
5. Explain how the cost was developed for the DRMS.

6. Has the Company performed any benchmarking to compare its proposal for DRMS to other utilities' DRMSs? If so, provide such analysis.
7. Explain why the Company concluded that three FTEs are required notwithstanding that implementing a DRMS increases automation and decreases the need for manual processes.
8. Will the DRMS also be used for registration, automation, analytics, and calling demand response events for the Direct Load Control program? If not, explain why not.
9. Will the DRMS aid in management of the New York Independent System Operator's (NYISO) Special Case Resources (SCR) program? If not, explain why not.
10. Does the Company plan to use the DRMS beyond Data Year 2? If so, provide a forecast of the ongoing DRMS costs per year. If not, explain why.
11. Provide a detailed description of the Conservation Load Management Operating Expenses shown in Exhibit __ (RRP-3), Schedule 37.

Response:

1. As explained in the Electric Customer Panel testimony (pg. 25 of 84), the Company's DLM programs ((Direct Load Control, Distribution Load Relief Program ("DLRP")), and Commercial System Relief Program ("CSR")) are currently of a robust size and are a challenge to manage with present resources. In preparing the case, the Company identified that these programs are expanding in scope (*i.e.*, moving to statewide eligibility) and are projected to continue growing over the next few years. Because of these factors, two additional resources are required to help manage the day-to-day operations of the programs, while a third FTE is needed to lead the marketing efforts.
2. Two FTEs will have the responsibility of managing the day-to-day operations of the DLM programs, coordinating with the respective program partners, coordinating with the many internal Company departments and functions required to properly support the programs, and reporting on progress of the programs. The two FTEs will also be responsible for overseeing evaluation of the two programs and managing ongoing changes and enhancements. These two FTEs are envisioned as being split between the Company's Sales & Program Operations group and its Strategic Business, Policy, and Evaluation group.

A third FTE will have the responsibility of overseeing all marketing and customer experience aspects of the DLM programs, including the design, development, and implementation of customer web interfaces and marketing communication plans, in coordination with the respective program partners and internal Company departments and functions. The FTE will help integrate new customers and technologies into the DLM programs, especially for newly developed designated areas. In addition, the FTE will evaluate and refine program marketing on an ongoing basis to meet customer

participation targets and will help lead customer experience surveys to inform program enhancements. This FTE is envisioned as part of the Marketing & Customer Experience product marketing team.

- 2a. All three of the proposed FTEs will be dedicated solely to NMPC.
- 2b. Please see the response to question 2a.
3. The Company has engaged with the other NY joint utilities, and believes that its proposal for three FTEs is in alignment with the resource needs of its peer NY utilities to help develop, market, and successfully deliver their DLM programs.
4. Please see the Company's response to DPS-275 (IS-4), Attachment 6 (pgs. 30-48), which includes a discussion of drivers, benefits, projects costs, and alternatives considered for the DRMS. Note that this referenced attachment is still in draft form and is subject to change.
5. The Company developed the cost for the DRMS by soliciting competitive bids through a formal Request for Proposal ("RFP") process. This process allowed the Company to compare prices among multiple vendors for the scope of work desired and negotiate rates to obtain the most value for the DRMS and for customers.
6. The Company compared cost proposals received through the formal RFP responses discussed above. By comparing costs for all vendors that responded to the RFP, the Company was able to determine which solution set provided the most value given the scope of work required for the DRMS. In addition, the Company contracted with Navigant Consulting, a consulting company with extensive DRMS knowledge, to help ensure that prices received by the Company through the formal RFP process were competitive for the industry.
7. Although some of the manual tasks of the DLM Programs, such as having larger commercial and industrial customers fill out paper applications and manually transferring this information into the Company systems, or calculating each customer's performance using spreadsheets, can be replaced by the capabilities of the DRMS, the proposed FTEs are still required to appropriately complete the functions listed in question 2 of this response, particularly given the anticipated expansion and growth of the DLM Programs. Further, without the deployment of a DRMS, the Company believes that more than three FTEs would be required to handle the manual processes associated with the delivery of the DLM programs, specifically with regard to the CSRP and DLRP programs.

In addition, notwithstanding the DRMS, the additional FTEs are needed to build successful relationships with the NY PSC, DPS Staff, the NY Joint Utilities, the NYISO, and other important stakeholders as it relates to the DLM programs. The Company strongly believes these relationships are critical to the long-term success of the DLM programs in New York, and its proposed FTEs will allow the Company to simultaneously establish and improve those relationships, deliver successful DLM programs, and also

oversee the implementation of the DRMS, all of which drive better performance and value for the State and for customers.

Lastly, to help grow these programs and meet proposed targets, the Company believes a marketing-focused FTE is required to appropriately update existing program web sites and develop marketing information, flyers, and pamphlets to be used as educational tools for both internal and external outreach.

8. At this time, the Company's proposed DRMS will be used for the registration, automation, analytics, and calling of demand response events for only its commercial and industrial customers through the Company's CSRP and DLRP. Both of these programs are now expanded to include all of the Company's service territory, and are the programs that benefit most from the DRMS. The DRMS will also be used to calculate participating customer incentives, provide near-real time monitoring of events, and monitor the state of the grid to determine when, where, and for how long demand response events are needed for the CSRP and DLRP programs.

At this time, the Company is not planning to use its proposed DRMS for its existing Direct Load Control program, a program targeted for residential and small business customers. The Company is planning to continue with its existing and successful demand response platform providers, customer enrollment channels, and currently contracted program partners.

Based on initial evaluation results from the Company's experience with the DRMS for the CSRP and DLRP programs, monitored customer participation in all of the Company's DLM programs, ongoing review of the DRMS industry and market, future expiration of current program partner contracts for the Direct Load Control program, and updated benefit-cost analyses, the Company will, in the future, look to explore opportunities for aligning all of the DLM programs within a single DRMS platform, if it proves beneficial.

9. The DRMS will not aid in the management of NYISO's Special Case Resources program. The Company does not participate in this program, which means that it does not enroll or manage demand response assets to respond to Special Case Resources demand response program dispatches.

However, in some cases, the Company will call demand response assets through its CSRP and DLRP programs that will be coincident with the NYISO's Special Case Resources dispatches. The proposed DRMS will better help the Company synchronize these coincident calls, thereby avoiding double performance payments to customers.

10. The Company anticipates that the CSRP and DLRP programs will continue to grow. As such, the Company will need a DRMS in addition to the proposed FTEs to successfully manage all DLM programs. As such, the Company will explore opportunities of continuing the use of a DRMS beyond Data Year 2. To obtain the highest value for a DRMS and for customers, the Company may seek to deploy a second formal RFP process to extend DRMS services beyond Data Year 2. Because this process may

involve a new vendor, the Company cannot at this time provide a forecast of DRMS costs beyond Data Year 2.

11. The Conservation Load Management operating expenses shown in Exhibit__(RRP-3), Schedule 37, represent the reservation and performance payments to third-party aggregators who enroll customers to participate in the Commercial System Relief Program. Please refer to Attachment 1 to DPS-363 for the vendor costs related to the Commercial System Relief Program.

Name of Respondent:

Nick Corsetti
MaryEllen O'Connell
Paul Wassink

Date of Reply:

June 26, 2017

Date of Request: June 14, 2017
Due Date: June 26, 2017

Request No. DPS-354 RAC-7
NMPC Req. No. NM-833

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Robert Cully

TO: National Grid, Electric Customer Panel

SUBJECT: **RESIDENTIAL SOLAR MARKETPLACE**

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

1. Explain how the Company developed its proposal for two FTEs to manage its Residential Solar Marketplace and E-Commerce Platform.
2. Provide a detailed list of the work functions and responsibilities for the two FTEs that will manage the Residential Solar Marketplace and E-Commerce Platform.
 - a. Will the FTEs be dedicated solely to NMPC, or will these FTEs also support projects by other National Grid companies?
 - b. If the FTEs will be shared with other National Grid companies, provide the FTEs' allocation to NMPC.
3. Provide the whitepaper and sanction paper for the Residential Solar Marketplace.
4. Has the Company performed any benchmarking to compare its proposed Residential Solar Marketplace to similar projects at other utilities? If so, provide each such analysis.
5. What is the revenue requirement associated with the \$0.054 million capital expenditure for the Residential Solar Marketplace during the Rate Year, Data Year 1, and Data Year 2?
6. Are there any ongoing or recurring capital or operations expenses related to the Residential Solar Marketplace beyond Data Year 2? If so, provide a forecast of such future expenditures.

7. Provide a list of historic residential solar installations per year for each of the past ten years.
8. How confident is the Company that it will achieve its projected sales through the Residential Solar Marketplace? Are the projected sales a realistic estimate, a conservative estimate, or a stretch goal?
9. Explain how the Company developed its forecast revenues related to the Residential Solar Marketplace. Provide any related workpapers.
10. Explain how the Company developed its proposal for a Platform Service Revenue (PSR) related to the Residential Solar Marketplace. Explain how the Company's proposal for a PSR related to the Residential Solar Marketplace is consistent with the *Order Adopting a Ratemaking and Utility Revenue Model Policy Framework*, issued on May 19, 2016 in Case 14-M-0101 (Track Two Order).

Response:

1. In preparing the case, the Company identified a need for an FTE to lead initial development and ongoing program management of two new offerings for the Company, the Residential Solar Marketplace and the E-Commerce Platform. To support these new offerings and help promote customer awareness and use of the new platforms, the Company also identified the need for a second FTE to develop and lead the marketing efforts.
2. One FTE will have the responsibility of leading the development of both the Residential Solar Marketplace and the E-Commerce Platform, managing the day to day operations, coordinating with the respective program partners, and coordinating the many internal Company functions required to support these new offerings. That FTE will be responsible for reporting on progress of the two programs. The FTE will also be responsible for overseeing evaluation of the two programs and managing ongoing changes and enhancements. This FTE is envisioned as part of the Company's New Energy Solutions program delivery team.

A second FTE will have the responsibility of overseeing all marketing and customer experience aspects of the two programs, including the design, development, and implementation of customer web interfaces and marketing communication plans, in coordination with the respective program partners and internal Company functions. This FTE will use Company data and analysis to segment and target marketing to maximize cost-effectiveness, increase customer engagement in the use of these platforms, and will evaluate and refine program marketing on an ongoing basis, utilizing feedback to help inform program enhancements. This FTE is envisioned as part of the Company's Marketing & Customer Experience product marketing team.

a/b. Both of these FTEs will be dedicated solely to NMPC.

3. National Grid put out a competitive Request for Qualifications for a solar marketplace in Rhode Island in 2015 and selected EnergySage (see Attachment 1). Based on the success of the project in RI, the Company proposed the NY Residential Solar Marketplace offering within the organization in the fall of 2016. A high-level overview presentation slide deck was utilized to educate Company leadership on the program, and is included to this response as Attachment 2. The project was subsequently approved through the Company's Delegation of Authority process, without the need for a sanction paper.
4. In March of 2017, the Company concluded the first year of a pilot in its Rhode Island jurisdiction that introduced residential energy efficiency customers to a solar PV option and a customized online marketplace of solar installers powered by EnergySage (<https://www.energysage.com/ri-solarwise/>). In that pilot year, the Company found that online marketplace customers converted to solar PV adoption at high rates (20%+), and EnergySage was a capable and flexible program implementation partner, with a strong commitment to customer satisfaction and solar installer enablement. With regard to program promotion, the Company found that its home energy efficiency audit channel was less effective than expected in promoting solar, in part due to the novel nature of the solar offering, and in part because of efficiency customers' primary interest in the standard efficiency measures.

In Rhode Island, the Company is currently planning improvements for the second year of the program to help increase participation and to better align the efficiency and solar sales processes. The Company's experience in Rhode Island informed its proposal within the NMPC rate case, including the need for dedicated marketing resources.

The Company is also aware that Avangrid-NYSEG has partnered with EnergySage as its solar program partner for its YES Home Solutions initiative (<https://www.yeshomesolutions.com/pages/residential-solar>). Avangrid-NYSEG selected participating solar installers for that program based on a series of pre-determined requirements. In contrast, the Company plans to allow all installers that meet EnergySage's requirements to participate in its Residential Solar Marketplace, allowing for greater competition and lower costs for both installers and customers. The Company listed these requirements for participating solar installers in its response to UIU-3 (KOH-93).

5. The revenue requirement associated with the \$0.054 million capital expenditure for the Residential Solar Marketplace is \$21,665 for the Rate Year, \$20,015 for Data Year 1, and \$18,749 for Data Year 2.

Please note that the Company inadvertently did not reflect the \$0.054 million capital expenditure in the revenue requirement in Exhibit __ (RRP-3), Schedule 9. The Company will make this adjustment in its Corrections and Updates filing.

6. At this time, the Company is not proposing any additional capital expenses beyond Data Year 2. If the program proves successful, the ongoing O&M costs would continue and any additional costs would be evaluated at that time.
7. Below is a table that provides all residential solar installations in the Company's Upstate NY electric territory for each of the past 10 years.

Year	# NMPC Residential Interconnections
2017 (as of June 15, 2017)	1063
2016	4202
2015	4829
2014	2286
2013	929
2012	745
2011	516
2010	448
2009	277
2008	139
2007	107

8. The Company utilized a sales model developed in part with its program partner EnergySage that took into account a variety of marketing channels and estimated solar purchase rates associated with each. The Company was both conservative and realistic in the development of projected sales. By incorporating the lessons learned from its experience in Rhode Island, the Company's goal is to meet or exceed these sales targets.
9. The model utilized by the Company to establish annual sales goals and calculate associated revenues for its proposed NY Residential Solar Marketplace is provided to this response as Attachment 3.

Please note that portions of Attachment 3 have been redacted because it contains confidential information. A confidential version of Attachment 3 has been provided to Staff separately. As discussed at the recent procedural conference, the Company anticipates that a protective order governing the handling of confidential material will be issued by the Administrative Law Judges shortly. Please protect the information from public disclosure.

The assumptions used are built into the model and are noted on page 1 of the attachment. The Company rounded down from the sales figure (516) shown in the Sales Model on page 1 to arrive at its first year goal of 500 PV system sales through the Residential Solar Marketplace, and then assumed modest growth in years 2 and 3 (10% and 5% increase from the prior year, respectively).

10. Per the *Order Adopting a Ratemaking and Utility Revenue Model Policy Framework* (the “Track Two Order”), the Company seeks to develop new revenue streams and animate the market for third party participants while engaging customers to take control of their energy use through education. The Residential Solar Marketplace will help to stimulate and expand the competitive market for residential solar, and will enable customers to access energy solutions that will impact their bills. The Company’s proposal is consistent with the criteria for platform service revenues put forth by the commission in the Track Two Order (pages 48-50). Specifically, the proposal will (a) facilitate the growth and operation of markets for residential solar systems; (b) broaden the reach of the existing market and promote more competitive pricing; (c) utilize the utility-customer relationship to promote more efficient outreach to potential solar customers; and (d) not impede competitive providers from entering the marketplace. In addition to meeting the above criteria, the Company’s proposed Residential Solar Marketplace is very similar to the “customer origination” service provided as an example in footnote 57 on pg. 50 in the Track Two Order.

The Company developed its proposal by considering Staff’s guidance on the pricing method and allocation formula in the Track Two Order (pages 50-52). In terms of revenue sharing, as noted in the Electric Customer Panel testimony (pgs. 14-15 of 84), the Company will receive a portion of the fee that solar installers pay (based on sales) to EnergySage for obtaining sales via the Residential Solar Marketplace. For the allocation of revenue, the Company proposes to share revenue earned by the Company from each sale within the marketplace with customers on a 50 percent/50 percent basis each year. In other words, half of the revenue earned by the Company through the Marketplace will be used to offset program costs, while the other half will be retained by the Company as an incentive to optimize lead generation, consistent with the Track Two Order.

Name of Respondent:

Nick Corsetti
Karsten Barde
Kara Fedors

Date of Reply:

June 26, 2017

National Grid

Request for Qualifications (RFQ)

Solar Screening and Marketplace Services

Purpose

National Grid is evaluating offering Solar Screening and Marketplace services as part of its Rhode Island Renewable Energy (RE) Growth program, to provide easy access to solar installation quotes to all National Grid customers, thereby reducing soft costs and increasing competition through an online marketplace for solar.

The current statewide residential Energy Efficiency (EE) Assessment program is branded “EnergyWise” and this addition of solar promotion is by extension proposed to be called “SolarWise”. National Grid may propose to the RI Public Utilities Commission a plan to offer up to half of the allocated small and medium solar classes in RE Growth Program in a given year through an EE-linked program. Respondents to this RFQ would be providing critical services within the SolarWise program.

Statement of Need

The purpose of this RFQ is to learn about potential partners who offer the tools and services National Grid requires to offer Solar Consultation and Marketplace service to its customers. We seek to hear from qualified suppliers whose business strategies target this emerging market. The program goal is to provide solar screening for residential and commercial customers, provide tools to bring them to an on-line marketplace, and provide them with offers from qualified installers.

National Grid would like to offer this solar screening solution as part of its general energy efficiency assessment process. The solution should offer a solar screening of each audited property, an on-line platform whereby customers could register for and receive solar offers from multiple participating installers, and tools to compare offers, such as cash purchase vs. loan-financed vs. lease/PPA. Customers would be responsible for managing and closing their solar transaction which would not be contingent on any EE measure implementation.

With this Request for Qualification we request information regarding your company and your products/services. National Grid seeks to understand each respondent’s business strategy and service offerings for utilities and utility customers in the areas discussed below.

Program Features

National Grid has preliminarily identified the following features of its proposed RI SolarWise program. Please describe your existing products and services in these areas, with description of how they may be tailored to the needs of National Grid and our RI partners and customers, or how the Program might be enhanced with the respondent's capabilities. If you are currently developing new products or services in any of these areas, please describe the status and expected availability date.

1. Batch Pre-Screening of Addresses for Solar Potential

Based on addresses provided by National Grid or its EE vendors, conduct solar screenings on each address and provide a summary PDF for each address indicating appropriateness for solar, amount of potential solar, and the amount of energy such a facility could produce, and or other information agreed to by the parties. PDF should be final and suitable for printing for distribution to customers receiving comprehensive energy assessments or technical studies from the Company. Online access to the solar screening results may also be of value to customers. Pre-screening materials must include an aerial satellite image of the property.

2. Interactive Online Tool for Comparing Solar Product Structures

Provide a white-label or co-branded online tool to compare the combinations of solar installation and illustrative financing options.

Provide a pre-established profile for the customer to access with their initial screening, to which they could add detailed information.

3. Solar Vendor Marketplace:

Establish a list of prescreened solar vendors with input from National Grid and the Office of Energy Resources for Rhode Island customers that will actively and quickly provide customers with bids for solar projects via the marketplace through the on-line tool. Please describe your process for qualifying vendors for inclusion in the marketplace. Provide detail on how vendors can provide details on the quality or components or installation procedures in their quotes, and any customer feedback, ranking or audit capabilities to track the performance of installers.

4. Solar Financing Marketplace:

Provide a sub-portal for potential financing offers for customers, including private (bank or non-bank) providers, Commercial Pace loans, Residential Pace loans, the state Efficient Building Fund loans from the RI Infrastructure Bank, lease financing and Power Purchase Agreement offerings.

Provide a tool to compare the combinations of solar installation and financing options on a lifetime Levelized Cost of Energy basis, or other appropriate comparisons or metrics.

5. Customer Advisory Services

Provide customers with online and phone advisory services in sizing and selecting solar arrays and vendors, taking account of RI RE Growth program rules, such as sizing restrictions and the mechanics of the program payment mechanisms, such as bill credit flows and PBI payments. National Grid would provide training to such advisors on RE Growth specifics.

6. Training

Provide training and materials customer-facing personnel of National Grid employees and its energy assessment vendors to provide basic information about the screenings and the availability of the solar marketplace.

Initial Project Scope & Market Sizing

National Grid anticipates conducting approximately 12,000 total energy assessments or technical studies per year in Rhode Island, spread across all customer sizes. The current proposed allocations for the Small and Medium Solar allocations for 2016 are 7.25 MW for Small (1-25 kW DC) and 6 MW for Medium (26-250 kW), of which we could request to reserve up to 50%, or 6.625 MW total. At 20 kW on average this would be about 330 installations over 6.625 MW. National Grid would be interest in any statistics from respondents about the average percentage of locations that would be appropriate for solar in Rhode Island, and the average conversion rate of participants in on-line markets to solar installation offers.

Estimated Project Costs

Please provide an estimate of your internal cost of delivering the products and services described above. National Grid anticipates making a possible 1-year initial commitment, with the potential for a longer-term contract based on effective performance. Please know that negotiations and additional discussions may be needed.

	Fixed Costs (e.g. initial setup)	Variable Costs (e.g. per customer)
Batch Pre-Screening of Addresses for Solar Potential		
Interactive Online Tool for Comparing Solar Product Structures		
Solar Vendor Marketplace		
Solar Financing Marketplace		
Customer Advisory Services		
Training		

Anticipated Revenue Associated with Customer Activity

National Grid understands that partners in this market may receive revenue from participating solar vendors who are included in the marketplace, receive customer leads, provide project bids, close transactions with customers identified as part of the program, or otherwise benefit from program participation. Please describe your revenue strategy, including how solar vendors are billed (e.g. flat fee for marketplace participation, per customer lead, per closed transaction). If possible, please estimate your anticipated revenue per customer.

Please provide any alternative pricing and revenue structures, such as fixed rate payments for any of the components of the Program.

Qualifications

Current Market

Please describe your company's current presence in the Rhode Island market (if applicable), as well as your company's broader market presence nationally and internationally.

Customer References

Please describe your existing utility customers or other customers for whom you provide the services identified above.

Roadmap

If you are currently developing, but do not offer, features identified above, please describe that product roadmap.

Instructions

Please provide a concise written proposal with an overview and description of the services you provide related to the scope of services in the sections above. Please have your proposal follow the format below and maintain a limited number of pages (under 50) for ease of review.

1.) Introduction and Overview of your Company

Description of previous or similar services, experience with other utilities, energy efficiency programs, State Agencies, Municipalities, and Customer types (i.e. residential, small, medium, or large commercial customers)

2.) How your firms can perform and price out the Main program services

- Batch Pre-Screening of Addresses for Solar Potential
- Interactive Online Tool for Comparing Solar Product Structures
- Solar Vendor Marketplace
- Solar Financing Marketplace
- Customer Advisory Services
- Training

3.) Implementation and Start-up Timeline. Please provide a start-up plan and timeline of how your firm can begin offering these services. Please include major milestones like web portal set up, screening/processing of data, and financing options.

4.) Other Services and Alternate Approaches. We know your company may have other services and alternative solutions to the services described with this request. Please provide any additional approaches to these services that you may have. Please keep this high-level as we may want to delve deeper into these during the interview and negotiation phase.

5.) Pricing. Please describe your pricing and cost structure mechanisms as they pertain to the main services requested. Please know that negotiations and additional discussions may be needed.

Please know that this is the first step in our process to examine the market place for these services. We may need to have further conversations with your company, interviews, software demos, site visits, and price negotiations as needed.

Terms and Conditions

Please see National Grid's Terms and Conditions. Know that while some exceptions to our terms may be acceptable, we are a highly regulated company and contractual commitments are subject to regulatory approval.

Non-Disclosure Agreement. Please see the attached Mutual Non-Disclosure Agreement. This is a two-way agreement that maintains confidentiality of your proposal as well as our request for these services.

Background Check Requirements. Please see the attached background check requirements. These are needed as you will have direct customer contact, customer information, and customer data.

NY Solar Marketplace Overview



November 2016



Agenda

- Goals
- Customer Value
- Utility Value
- Solar Installer Value



Goals

- Develop new online information resources to help customers understand how solar works
- Offer online 'solar calculator' tool to help customers assess their solar potential
- Establish online solar marketplace platform, cobranded with EnergySage, Inc. where customers can obtain quotes from pre-screened local solar installers
- Conduct new customer engagement campaign using existing channels to drive traffic to online solar content

nationalgrid

- Improve customer service/installation quality of solar
- Reduce high pressure sales tactics
- Evaluate multiple bids to ensure it is the best solar fit for the customer
- Solar education provided by their trusted utility

Information



Offers online informational content about solar to residential customers

Solar Energy



Allows National Grid to be strategic about solar deployment through segment/geographic targeting

Revenue



Offers revenue sharing opportunity to help offset National Grid program costs

Solar Installer Opportunity

- New source for customer leads
- Provides lead generation fees of \$500-\$1,000 per sale
- Leverages National Grid branding to increase familiarity and trust



**National Grid - NY Residential Solar Marketplace
Sales Model**

Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238
Attachment 3 to DPS-354 RAC-7
Page 1 of 2

Assumptions

Total audience	1,400,000	Residential electric accounts in NIMO service territory
Single Family HH	70%	
Program Start Month	6/1/2018	

Marketing Channels

National Grid online account visits (unsolicited)

Have valid email and online account	65%	Internal estimate
Visit online account each month	2.0%	Estimate for non-duplicative visits
Click online solar "Call To Action" (CTA)	2.0%	Suggested by EnergySage (conservative)
Registration rate (online)	5.0%	Suggested by EnergySage based on customer "exploring" (similar to EnergySage general web landing page rate)

Email marketing

Have valid email and online account	65%	
Email "Click Through Rate" (CTR) Start of Year	2.0%	EnergySage: Industry guidance: 2-3% click-thru rate; RI program email marketing saw 4%+
Email CTR End of year	0.5%	Tapers over time with repeated exposure
% of CTR visits resulting in solar marketplace registration	5.0%	Conservative (may be 10%)

Direct mail/bill insert

Mailer URL entry	0.50%	EnergySage suggests 0.5% to be conservative
Mailer registration	7.5%	Conservative (expect to be higher than email registration)

Conversion Rates - customers registered with solar marketplace

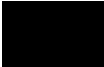
Approval rate	90%	% of customers successfully completing registration
"Close" rate (% completing purchases)	20%	Potential range: 10-35%; from RI program, rate was 21%

		Program Year 1												Year 1
Monthly Projections		Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	
Marketing channel														
Online account														
CTA visible on Online Acct	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Visit account		18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	18,200	
Click solar CTA		364	364	364	364	364	364	364	364	364	364	364	364	
Registrations		18	18	18	18	18	18	18	18	18	18	18	18	
Email														
Email sent?	Yes		yes		yes		yes		yes		yes			
Receive email		637,000	-	637,000	-	637,000	-	637,000	-	637,000	-	637,000	-	
Email CTR		2.00%	1.9%	1.7%	1.6%	1.5%	1.3%	1.2%	1.0%	0.9%	0.8%	0.6%	0.50%	
Click through email		12,740	-	11,003	-	9,265	-	7,528	-	5,791	-	4,054	-	
Registrations		637	-	550	-	463	-	376	-	290	-	203	-	
Direct mail/Bill insert														
Mailer sent?	Yes													
Mails received (Single fam)		980,000	-	-	-	-	-	-	-	-	-	-	-	
Mailer to URL Entry		4,900	-	-	-	-	-	-	-	-	-	-	-	
Registration		368	-	-	-	-	-	-	-	-	-	-	-	
Total Site Visits		18,004	364	11,367	364	9,629	364	7,892	364	6,155	364	4,418	364	
Total Registrations		1,023	18	568	18	481	18	395	18	308	18	221	18	
Overall Registration Rate		6%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	
Cumulative Registrations		1,023	1,041	1,609	1,627	2,109	2,127	2,522	2,540	2,848	2,866	3,087	3,105	
Approved for quotes		920	16	512	16	433	16	355	16	277	16	199	16	
Total Sales				184	3	102	3	87	3	71	3	55	3	

National Grid - NY Residential Solar Marketplace
Sales Goals and Forecasted Revenue

	Rate Year	Data Year 1	Data Year 2
Sales (#s)	500	550	575
Sales (kW)			
Revenue	\$ 147,000	\$ 161,700	\$ 169,050

Inputs
Average installed system size (kW)
Installer fee per watt paid to EnergySage
Portion shared with National Grid



Niagara Mohawk Power Corporation
d/b/a National Grid
Case 17-E-0238
Attachment 3 to DPS-354 RAC-7
Page 2 of 2

Date of Request: June 21, 2017
Due Date: July 3, 2017

Request No. DPS-390 SEK-34
NMPC Req. No. NM-925

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Sarah Keymel
TO: National Grid, Revenue Requirements Panel
SUBJECT: **ENERGY EFFICIENCY**

Request:

In these interrogatories, all requests for workpapers or supporting calculations should be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact.

1. Referring to Attachment 1 to the Company's response to DPS-202, explain why the total 2016 labor costs for electric and gas do not tie to the total historic test year labor costs shown on Exhibit__(RRP-11), Workpapers to Exhibit RRP-3, Schedule 27, Workpaper 4.
2. Provide a revised Energy Efficiency Labor Adjustment schedule (Exhibit__ (RRP-11), Workpapers to Exhibit RRP-3, Schedule 27, Workpaper 4, Page 1) that ties to the historic test year labor costs shown in Attachment 1 to the Company's response to DPS-202.

Response:

1. Attachment 1 corrects the Historic Test Year numbers in Attachment 1 to DPS-202 (LMR-5). While validating the Historic Test Year numbers, the Company realized it inadvertently excluded accruals for 'Time Not Worked'. Additionally, labor costs for approximately 15 days of calendar year ("CY") 2016 that were devoted to Energy Efficiency Portfolio Standard ("EEPS") 2 programs were included as part of the EEPS2 CY 2015 costs and, therefore, excluded from the CY 2016 costs.

2. Attachment 2 includes an updated Energy Efficiency Labor Adjustment schedule (Workpaper 4) that will also be included in the Company's Corrections and Updates filing. The Company updated Attachment 2 to reflect the corrections to the Historic Test Year costs described in the response to question 1.

Name of Respondent:

Lisa Tallet
Melissa M. Barnes

Date of Reply:

July 03, 2017

Niagara Mohawk Power Corporation d/b/a National Grid
Energy Efficiency Labor Adjustment

Adjustment to EE Labor

	Rate Year FY19	Data Year FY20	Data Year FY21
<u>Electric</u>			
ETIP Forecast Labor Costs	\$4,600,000	\$4,600,000	\$4,600,000
HTY Base Labor Costs	\$4,339,021	\$4,469,191	\$4,603,267
Residual EE Adjustment	\$260,979	\$130,809	(\$3,267)

<u>Gas</u>			
ETIP Forecast Labor Costs	\$1,800,000	\$1,800,000	\$1,800,000
HTY Base Labor Costs	\$1,239,072	\$1,276,244	\$1,314,531
Residual EE Adjustment	\$560,928	\$523,756	\$485,469

HTY NY spending by cost category
From January 2016 through December 2016

Cost Category	CostElement	NYELEC	NYGASD	Total
	B0030	\$ 464,489	\$ 128,639	\$ 593,128
	B0031	\$ 7		\$ 7
	C6001300	\$ 72,299	\$ 24,265	\$ 96,565
	C6001350	\$ (6,119)	\$ (1,176)	\$ (7,295)
Burden Total		\$ 530,676	\$ 151,728	\$ 682,405
Labor	B0040	\$ 478,144	\$ 127,662	\$ 605,807
	C6001150	\$ 50,597	\$ 59,353	\$ 109,950
	C6001500	\$ 79,538	\$ 24,779	\$ 104,317
	L0010	\$ 2,891,895	\$ 787,596	\$ 3,679,491
	L0020	\$ 169		\$ 169
Labor Total		\$ 3,500,344	\$ 999,390	\$ 4,499,734
Grand Total		\$ 4,031,020	\$ 1,151,118	\$ 5,182,138

				Labor Inflation
Total Labor & Burdens	Rate Year	\$4,339,021	\$1,239,072	7.64%
	Data Year 1	\$4,469,191	\$1,276,244	3.00%
	Data Year 2	\$4,603,267	\$1,314,531	3.00%

Total Energy Efficiency moved to base rates

Electric

	FY19	FY20	FY21	Total
ETIP to Base Rates	2,600,000	2,600,000	2,600,000	7,800,000
E-Commerce Marketplace	3,638,311	3,638,311	3,638,311	10,914,933
Labor	4,600,000	4,600,000	4,600,000	13,800,000
Total	10,838,311	10,838,311	10,838,311	32,514,933

Gas

	FY19	FY20	FY21	Total
Incremental EE Gas	528,000	528,000	528,000	1,584,000
E-Commerce Marketplace	1,137,073	1,137,073	1,137,073	3,411,219
Labor	1,800,000	1,800,000	1,800,000	5,400,000
Total	3,465,073	3,465,073	3,465,073	10,395,219
Grand Total	14,303,384	14,303,384	14,303,384	42,910,152

Niagara Mohawk Labor and Benefits recovered through EE
From January 2016 through December 2016

P1					
Cost Category	CostElement	NYELEC	NYGASD	Total	
	B0030	\$ 464,489	\$ 128,639	\$ 593,128	
	B0031	\$ 7	\$	\$ 7	
	C6001300	\$ 72,299	\$ 24,265	\$ 96,565	
	C6001350	\$ (6,119)	\$ (1,176)	\$ (7,295)	
Burden Total		\$ 530,676	\$ 151,728	\$ 682,405	
Labor	B0040	\$ 478,144	\$ 127,662	\$ 605,807	
	C6001150	\$ 50,597	\$ 59,353	\$ 109,950	
	C6001500	\$ 79,538	\$ 24,779	\$ 104,317	
	L0010	\$ 2,891,895	\$ 787,596	\$ 3,679,491	
	L0020	\$ 169	\$	\$ 169	
Labor Total		\$ 3,500,344	\$ 999,390	\$ 4,499,734	
Grand Total		\$ 4,031,020	\$ 1,151,118	\$ 5,182,138	

Segment	Personnel ID	Personnel Job Title	L03 Originating Cost Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYELEC	70000500	Dir Sales	160-Customer	160-Sales & Program Operations	Full Time	\$202												\$202
NYELEC	70000593	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$2,177	\$610	\$403	\$601	\$689	\$1,599	\$1,133	\$757	\$1,269	\$967	\$768	\$1,336	\$12,308
NYELEC	70000806	Manager	160-Customer	160-Market Development	Full Time	\$664	\$1,235	\$901	\$1,371	\$977	\$1,582	\$1,973	\$1,164			\$273	\$818	\$10,958
NYELEC			180-New Energy Solutions	160-Market Development	Full Time									\$1,170	\$1,399	\$943	\$0	\$4,143
NYELEC	70001341	VP Shaping Our Future	200-Exec Director-US	200-Shaping the Future	Full Time								\$89	\$100	\$445	(\$445)		\$189
NYELEC	70001476	Manager	160-Customer	160-Customer Engagement	Full Time	\$153	\$357	\$51	\$276			\$51		\$52	\$366	\$419	\$419	\$2,143
NYELEC	70001662	Prin Specialist	160-Customer	160-Customer Assurance	Full Time	\$693	\$329	\$750	\$959	\$835	\$876	\$750	\$771	\$771	\$846	\$901	\$836	\$9,315
NYELEC	70002311	Dir Program Strategy	160-Customer	160-Market Development	Full Time											\$29		\$29
NYELEC	70003432	Lead Engineer	160-Customer	160-Market Development	Full Time	\$616											\$435	\$1,050
NYELEC			180-New Energy Solutions	160-Market Development	Full Time											\$869		\$869
NYELEC	70006163	Lead Analyst	160-Customer	160-Customer Assurance	Full Time			\$309	\$622	\$573	\$678	\$340	\$539	\$631	\$599	\$599	\$432	\$5,322
NYELEC			320-US Finance	160-Customer Assurance	Full Time	\$603	\$638	\$303										\$1,544
NYELEC	70006172	Sr Analyst	160-Customer	160-Customer Assurance	Full Time	\$495	\$434	\$387	\$537	\$505	\$335	\$305	\$420	\$489	\$486	\$560	\$494	\$5,447
NYELEC	70006889	Dir Human Resources Projs	180-New Energy Solutions	310-HR SVP	Full Time											\$876		\$876
NYELEC	70009333	W Ldr & Testmn	220-Jurisdictions-MA	220-Maint & Const-MA Elec	Full Time		\$367	(\$367)										\$0
NYELEC	70009601	Lead Engineer	160-Customer	160-Market Development	Full Time	\$5,153	\$8,097	\$8,833	\$9,254	\$6,678	\$7,940	\$8,833	\$8,581	\$9,224	\$7,186	\$7,723	\$6,221	\$93,724
NYELEC	70011390	Lead Consultant	330-Total US IS	330-US IS	Full Time	\$375	\$364	\$321	\$407	\$214	\$300	\$236	\$193	\$321	\$278	\$321	\$257	\$3,588
NYELEC	70011699	Sr Analyst	160-Customer	160-Customer Assurance	Full Time	\$12	\$7	\$16	\$14	\$3	\$173			\$21		\$3		\$249
NYELEC	70015747	Lead Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$333	\$467	\$700	\$767	\$747	\$533	\$567	\$596	\$591	\$559	\$729	\$373	\$6,962
NYELEC	70016431	Dir Account Mgt	160-Customer	160-Sales & Program Operations	Full Time									\$1,074	\$878	\$765	(\$12)	\$2,705
NYELEC	70017004	Lead Analyst	160-Customer	160-Market Development	Part Time	\$2,129	\$1,981	\$2,327	\$2,179	\$1,684	\$1,585	\$990	\$1,618	\$2,284	\$2,284	\$2,617	\$1,699	\$23,378
NYELEC	70017226	Principal Economist	160-Customer	160-Advanced Data & Analytics	Full Time											\$21		\$21
NYELEC	70017228	Sr Representative	160-Customer	160-Customer Assurance	Full Time	\$824	\$375	\$432	\$173	\$115	\$86	\$445	\$118	\$118	\$118			\$2,804
NYELEC	70017739	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$259	\$493	\$493	\$545	\$457	\$527	\$383	\$428	\$503	\$383	\$526	\$335	\$5,332
NYELEC	70018853	Prin IT Engineer	330-Total US IS	330-IS Digital Risk & Security	Full Time						\$45	\$5		\$5		\$3		\$86
NYELEC	70019218	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$1,085	\$1,356											\$2,441
NYELEC	70019394	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$840	\$5,986	\$6,616	\$7,246	\$5,776	\$6,826	\$5,041	\$4,974	\$6,667	\$5,397	\$6,618	\$5,921	\$67,908
NYELEC	70019448	Dir IT Business Relations	330-Total US IS	330-US IS	Full Time		\$77			\$155						\$75	\$75	\$383
NYELEC	70019489	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time					\$430	\$191	\$120	\$73					\$814
NYELEC	70019563	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$3,212	\$0	(\$189)										\$3,023
NYELEC	70019625	Sr Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$932	\$2,486	\$3,263	\$3,573	\$2,952	\$1,864	\$1,864	\$962	\$1,443		\$2,244	\$3,847	\$25,429
NYELEC	70020761	Not assigned	160-Customer	160-Sales & Program Operations	Full Time	\$2,453		\$230										\$2,683
NYELEC	70020958	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$1,701	\$1,701	\$1,984	\$1,606	\$2,268	\$1,984	\$1,228	\$1,824	\$2,112	\$2,304	\$3,366	\$2,020	\$24,098
NYELEC	70021211	Lead Engineer	160-Customer	160-Sales & Program Operations	Full Time	\$5,909	\$5,757	\$6,060	\$6,969	\$6,052	\$6,060	\$3,979	\$6,836	\$7,406	\$7,406	\$8,774	\$6,845	\$78,054
NYELEC	70021444	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$968	\$921	\$555	\$1,087	\$591	\$709	\$791	\$972	\$696	\$852	\$1,202	\$505	\$9,849
NYELEC	70023445	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$4,398	\$7,266	\$7,648	\$8,413	\$7,074	\$8,030	\$6,501	\$6,436	\$7,216	\$7,460	\$7,363	\$6,144	\$83,949
NYELEC	70023824	Lead Program Manager	160-Customer	160-Market Development	Full Time	\$4,110	\$2,302	\$3,329	\$6,042	\$3,288	\$2,466	\$1,973	\$1,782	\$729	\$1,254	\$836	\$209	\$28,320
NYELEC	70024438	Service Representative C	210-Jurisdictions-NY	210-Customer Meter Services-NY	Full Time							\$72						\$160
NYELEC	70024656	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time				\$112	\$169	(\$25)	\$205		\$88				\$542
NYELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time													\$255
NYELEC	70025488	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,981	\$6,321	\$6,781	\$7,326	\$6,589	\$6,970	\$4,772	\$6,143	\$5,403	\$6,579	\$6,775	\$5,011	\$73,650
NYELEC	70025939	Lead Program Manager	160-Customer	210-JDX Executive-NY	Full Time	\$3,832	\$4,347	\$3,661	\$5,262	\$4,576	\$4,976	\$4,576	\$3,642	\$2,731				\$37,604
NYELEC			210-Jurisdictions-NY	210-JDX Executive-NY	Full Time									\$1,292	\$2,031			\$3,323
NYELEC	70026895	Representative	160-Customer	160-Sales & Program Operations	Full Time	\$3,240	\$5,130	\$5,569	\$6,210	\$4,725	\$5,299	\$5,670	\$5,288	\$5,526	\$5,390	\$4,339	\$3,526	\$59,912
NYELEC	70027429	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,402	\$6,254	\$6,153	\$6,739	\$5,860	\$6,739	\$5,567	\$4,575	\$6,405	\$5,795	\$6,405	\$5,795	\$70,690
NYELEC	70028159	Manager	160-Customer	160-Sales & Program Operations	Full Time			\$1,769	\$2,307	\$2,246	\$2,141	\$2,485	\$3,417	\$1,988		\$1,615	\$1,584	\$19,552
NYELEC	70029454	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$6,195	\$6,363	\$5,358	\$7,702	\$5,693	\$7,367	\$7,242	\$4,880	\$7,146	\$6,448	\$6,971	\$5,228	\$76,594
NYELEC	70030626	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$5,871	\$3,403	\$5,224	\$7,615	\$4,956	\$7,487	\$5,722	\$5,930	\$6,905	\$6,702	\$5,618	\$5,855	\$71,287
NYELEC	70031440	Lead Representative	160-Customer	160-Sales & Program Operations	Full Time	\$3,740	\$2,493	\$7,022	\$5,722	\$5,402	\$5,672	\$5,132	\$3,923	\$5,789	\$5,853	\$4,347	\$3,032	\$58,125
NYELEC	70031774	Lead IT Architect	330-Total US IS	330-US IS	Full Time	\$186	\$133	\$80	\$53		\$159	\$106			\$54	\$27	\$54	\$852
NYELEC	70032014	Dir Strategic Communication	460-Corporate Affairs	460-Strategic Communications	Full Time	\$3,123	\$4,946	\$5,466	\$5,987	(\$0)								\$19,522
NYELEC	70032196	Lead Program Manager	160-Customer	160-Market Development	Full Time	\$1,625	\$1,816	\$1,912	\$3,107	\$7,648	\$7,696	\$6,381	\$7,021	\$7,190	\$4,600	\$7,997	\$7,266	\$64,260
NYELEC	70034361	Analyst	160-Customer	160-Sales & Program Operations	Full Time		\$785											\$785
NYELEC	70036545	Sr Project Manager - Ops	160-Customer	160-Sales & Program Operations	Full Time	\$5,860	\$6,603	\$3,302										\$15,765
NYELEC	70046635	Dir Sales	160-Customer	160-Sales & Program Operations	Full Time											\$1,103	\$657	\$1,820
NYELEC	70046811	Manager	330-Total US IS	330-US IS	Full Time				\$166	\$552	\$276	\$0	\$476	\$308	\$224	\$364		\$2,366
NYELEC	70046840	Exec Advisor	160-Customer	160-Customer Leader	Full Time	\$678	\$927	\$976	\$1,122	\$781	\$1,103	\$977	\$1,282	\$1,299	\$1,395	\$1,116	\$1,325	\$12,981
NYELEC	70048190	Lead Analyst	160-Customer	160-Market Development	Full Time											\$2,927		\$6,163
NYELEC	70048413	Engineer Manager	160-Customer	160-Sales & Program Operations	Full Time												\$1,118	\$1,118
NYELEC	70051586	Dir Program Strategy	160-Customer	160-Market Development	Full Time	\$2,172	\$6,183	\$5,328	\$8,623	\$4,556	\$7,159	\$6,427	\$4,622	\$2,889	\$5,055	\$3,900	\$3,611	\$60,524
NYELEC	70051980	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$4,661	\$5,593	\$6,525	\$7,147	\$5,904	\$6,680	\$6,059	\$6,952	\$7,021	\$7,704	\$6,144	\$5,510	\$75,900
NYELEC	70052823	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,500	\$5,153		\$12,556	\$5,444	\$6,097	\$5,081	\$5,414	\$6,166	\$6,317	\$6,418	\$5,202	\$68,348
NYELEC	70053010	Manager	160-Customer	160-Customer Assurance	Full Time	\$773	\$743	\$822	\$822	\$822	\$626	\$783	\$845	\$684	\$764	\$845	\$804	\$9,332
NYELEC	70053795	Manager	160-Customer	160-Market Development	Full Time	\$5,615	\$5,178	\$5,097	\$4,906	\$5,178	\$5,451	\$5,724	\$5,335	\$5,122	\$4,855	\$5,869	\$4,588	\$62,917
NYELEC	70053799	Lead Program Manager	160-Customer	180-VP New Energy Solutions	Full Time	\$3,729	\$3,146	\$2,874	\$3,767	\$3,729	\$4,583	\$4,381						\$26,209
NYELEC			180-New Energy Solutions	180-VP New Energy Solutions	Full Time								\$2,987	\$1,572				\$4,559
NYELEC	70054601	Lead Analyst	160-Customer	160-Market Development	Full Time		\$1,763	\$2,194	\$1,410	\$2,141	\$2,186	\$2,080	\$3,319	\$2,767	\$3,039	\$2,996	\$3,006	\$26,901
NYELEC	70054878	Lead Planner	160-Customer	110-Electric Process & Engineering	Full Time	\$725	\$289											\$1,014
NYELEC	70063833	SVP Chief Customer Officer	160-Customer	160-Customer Leader	Full Time	\$1,022		\$1,923	\$2,482	\$462	\$4,098	\$2,367	\$1,429	\$1,864	\$1,864	\$124	\$249	\$17,883
NYELEC	70064262	Acting Coordinator	200-Exec Director-US	200-Shaping the Future	Full Time											(\$167)		\$0
NYELEC	70064966	Lead Program Manager	160-Customer	160-Market Development	Full Time											\$1,620	\$575	\$2,195
NYELEC	70064994	Sr Specialist	160-Customer	160-Customer Engagement	Full Time												\$67	\$67
NYELEC	70065318	Analyst	160-Customer	160-Process & Performance	Full Time				\$107	\$119	\$62			\$123	\$34			\$446
NYELEC	70065471	Lead Analyst	160-Customer	160-Market Development	Full Time	\$154	\$208		\$35	\$71		\$18	\$9					\$477
NYELEC	70065763	Sr Specialist	160-Customer	160-Customer Engagement	Full Time	\$612	\$379	\$399	\$459	\$399	\$442	\$376	\$382	\$443	\$410	\$394	\$331	\$5,027
NYELEC			160-Customer	160-Market Development	Full Time	\$731	\$822	\$2,010	\$2,010	\$1,644	\$2,010	\$1,096	\$1,122			\$477	\$858	\$12,780
NYELEC			180-New Energy Solutions	160-Market Development	Full Time								\$748	\$1,309	\$1,122			\$3,226
NYELEC	70711341	VP New Energy Solutions	160-Customer	180-VP New Energy Solutions</														

Segment	Personnel ID	Personnel Job Title	L03 Originating Cost Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYELEC	70713433	Analyst	450-Global Procurement	320-Shared Services	Full Time											\$133	\$1,061	\$1,194
NYELEC	70713487	Supv Non Operations	320-US Finance	320-Shared Services	Full Time					\$7	(\$7)							\$0

Segment	Personnel ID	Personnel Job Title	L03 Originating Cost Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYSELEC	70713490	Lead Engineer	160-Customer	160-Market Development	Full Time	\$3,781	\$5,293	\$5,482	\$5,955	\$5,671	\$5,671	\$4,973	\$2,102			\$2,402	\$4,067	\$45,398
NYSELEC			180-New Energy Solutions	160-Market Development	Full Time								\$3,223	\$5,058	\$5,356		\$2,876	\$16,513
NYSELEC	70713559	Lead Program Manager	160-Customer	210-JDx Executive-NY	Full Time	\$5,261	\$6,247	\$4,603	\$3,946									\$20,057
NYSELEC			210-Jurisdictions-NY	210-JDx Executive-NY	Full Time				\$1,476	\$1,337	\$876	\$715	\$208	\$138	\$115	\$92	\$23	\$4,981
NYSELEC	70713560	Lead Eng Supv-Operations	160-Customer	160-Sales & Program Operations	Full Time	\$4,622	\$6,273	\$6,603	\$7,264	\$6,603	\$6,933	\$5,613	\$6,962	\$6,630	\$6,299	\$7,593	\$5,591	\$76,987
NYSELEC	70713593	Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$4,251	\$3,401	\$5,870	\$3,834	\$3,752	\$4,856	\$4,635	\$3,214	\$3,616	\$3,817	\$4,218	\$4,018	\$49,482
NYSELEC	70713656	Lead Program Manager	160-Customer	210-JDx Executive-NY	Full Time	\$3,946	\$3,946	\$5,826	\$6,381	\$5,549	\$6,103	\$4,994	\$5,585	\$5,772	\$2,817			\$50,918
NYSELEC			210-Jurisdictions-NY	210-JDx Executive-NY	Full Time										\$899	\$2,074		\$2,972
NYSELEC	70713791	Lead Project Manager - Ops	160-Customer	180-VP New Energy Solutions	Full Time	\$6,363	\$6,739	\$7,032	\$3,014									\$23,149
NYSELEC	70713807	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,685	\$4,028	\$7,480	\$6,042	\$4,891	\$5,754	\$4,809	\$4,964	\$4,492	\$5,626	(\$741)	\$3,310	\$55,340
NYSELEC	71002214	Lead Analyst	160-Customer	160-Customer Assurance	Full Time	\$698	\$614	\$679	\$743	\$485	\$711	\$679	\$536	\$570	\$688	\$704	\$604	\$7,711
NYSELEC	71002978	Not assigned	160-Customer	160-Process & Performance	Full Time	\$270	\$219		\$252	\$208	\$164	\$186	\$214	\$236	\$225	\$180	\$169	\$2,323
NYSELEC	71003554	Sr Analyst	160-Customer	160-Advanced Data & Analytics	Full Time								\$54	\$18	\$98	\$46	\$882	\$1,097
NYSELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$9	\$50								\$59
NYSELEC	71005808	Manager	160-Customer	160-Advanced Data & Analytics	Full Time		\$298	\$417	\$312	\$253	\$268	\$268	\$184	\$169	\$121	\$75	\$56	\$2,420
NYSELEC	71005934	VP Sales & Sales Operation	160-Customer	160-Sales & Program Operations	Full Time		\$822	\$1,999	\$1,262	\$790	\$1,448	\$1,086	\$1,455	\$1,273	\$1,977	\$1,843	\$1,698	\$15,653
NYSELEC	71008181	Manager	160-Customer	160-Advanced Data & Analytics	Full Time			\$193	\$173	\$929	\$178	\$184	\$200	\$160	\$196	\$228	\$228	\$2,669
NYSELEC	71010287	Not assigned	160-Customer	160-Market Development	Full Time							\$6,183	(\$2,929)					\$3,254
NYSELEC	71012567	Dir Adv Data Analytics	160-Customer	160-Advanced Data & Analytics	Full Time	\$834	\$1,182	\$1,460	\$1,536	\$1,336	\$1,469	\$134						\$7,951
NYSELEC	71012709	Lead Analyst	160-Customer	160-Customer Assurance	Full Time	\$3,341	\$5,166	\$6,762	\$8,154	\$7,955	\$8,353	\$7,259	\$6,604	\$8,461	\$8,564	\$8,254	\$7,893	\$86,766
NYSELEC	71013697	Manager	160-Customer	160-Sales & Program Operations	Part Time	\$70												\$70
NYSELEC	71014314	Dir Customer Assurance	160-Customer	160-Customer Assurance	Full Time	\$393	\$389	\$330	\$130	\$260	\$303	\$433	\$421	\$443	\$266	\$421	\$355	\$4,144
NYSELEC	71015149	Sr Analyst	160-Customer	160-Advanced Data & Analytics	Full Time	\$279		\$127					\$246		\$1,219	\$861	\$534	\$3,267
NYSELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$233	\$254								\$1,132
NYSELEC	71015297	Coordinator	160-Customer	310-Recruiting	Full Time									\$149				\$149
NYSELEC	71015460	Director	160-Customer	160-Process & Performance	Full Time	\$740	\$867	\$1,071	\$1,122	\$918	\$1,110	\$1,071	\$1,046	(\$52)		\$392	\$432	\$8,719
NYSELEC	71015650	Lead Analyst	160-Customer	160-Market Development	Full Time	\$574	\$4,655	\$2,501	\$2,724	\$1,436	\$1,337	\$446	\$190	\$333	\$381	\$286	\$381	\$15,243
NYSELEC	71015655	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time	(\$51)	\$188	\$296	\$227	\$197	\$168	\$207	\$502	(\$172)	\$135	\$181	\$163	\$2,041
NYSELEC	71016757	Sr Analyst	160-Customer	160-Customer Engagement	Full Time	\$1,205	\$1,728	\$2,069	\$2,310	\$2,009	\$2,210	\$1,627	\$1,676	\$2,305	\$2,096	\$1,781	\$1,530	\$22,547
NYSELEC	71016791	Lead Analyst	160-Customer	160-Market Development	Full Time	\$4,754	\$2,080	\$3,021	\$2,724	\$2,426	\$2,426	\$1,387	\$1,761	\$1,927	\$1,737	\$2,284	\$1,237	\$27,765
NYSELEC	71017096	Sr Program Manager	160-Customer	160-Sales & Program Operations	Full Time							\$214						\$214
NYSELEC	71017274	Lead Analyst	160-Customer	160-Customer Care	Full Time											\$332	\$127	\$551
NYSELEC	71017925	Principal Quantitative Analyst	160-Customer	160-Advanced Data & Analytics	Full Time			\$604	\$413	\$117	\$271	\$259	\$269	\$192	\$404	(\$110)	\$105	\$2,523
NYSELEC	71018001	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$259	\$519	\$519	\$571	\$509	\$455	\$503	\$438	\$503	\$455	\$443	\$335	\$5,508
NYSELEC	71018094	Dir Special Events	160-Customer	160-Customer Engagement	Full Time	\$151	\$199	\$215	\$83	\$365	\$249	\$249	\$174	\$262	\$133	\$265	\$166	\$2,510
NYSELEC	71018133	Dir Energy Products Marketing	160-Customer	160-Customer Engagement	Full Time	\$470	\$862	\$588	\$902	\$784	\$923	\$797	\$839	\$1,071	\$888	\$598	\$713	\$9,436
NYSELEC	71018166	Sr Analyst	160-Customer	160-Customer Engagement	Full Time	\$2,572	\$1,446	\$1,969	\$2,491	\$1,768	\$2,049	\$1,366	\$1,676	\$922	\$838	\$1,341	\$1,383	\$19,822
NYSELEC	71018196	Dir Bus Process Adv Analytics	160-Customer	160-Advanced Data & Analytics	Full Time									\$220	\$355	\$347	\$338	\$1,259
NYSELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$139	\$208	\$305	\$277	\$220	\$124				\$1,274
NYSELEC	71018207	SVP Chief Customer Office	200-Exec Director-US	200-Exec Director-US	Full Time	\$1,592	\$1,441	\$1,592	\$874									\$5,499
NYSELEC	71018644	Lead Analyst	160-Customer	160-Customer Engagement	Full Time	\$59	\$24	\$0							\$106	\$176	\$141	\$568
NYSELEC	71019878	Lead Quantitative Analyst	160-Customer	160-Advanced Data & Analytics	Full Time			\$295	\$129	\$100	\$129	\$129	\$135	\$116	\$135	\$135	\$129	\$1,433
NYSELEC	71019991	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time		\$135	\$541	\$311	\$270	\$282	\$207	\$247	\$260	\$111	\$136	\$223	\$2,724
NYSELEC	71020022	Lead Analyst	160-Customer	160-Process & Performance	Full Time	\$240	\$304	\$336	\$184									\$1,063
NYSELEC			180-New Energy Solutions	160-Process & Performance	Full Time				\$185	\$253	\$219							\$658
NYSELEC	71021351	Manager	160-Customer	160-Sales & Program Operations	Full Time							\$55	\$546	(\$601)				\$0
NYSELEC	71023593	Prin Planner	160-Customer	110-Gas Process & Engineering	Full Time							\$89	\$187	\$187	\$158	\$167	\$167	\$955
NYSELEC			200-Exec Director-US	110-Gas Process & Engineering	Full Time				\$104	\$175	\$215	\$102						\$595
NYSELEC	71024127	Dir Market Development	160-Customer	160-Market Development	Full Time										\$139	\$64		\$233
NYSELEC			180-New Energy Solutions	160-Market Development	Full Time						\$390	\$520						\$909
NYSELEC	71024177	Exec Asst to Band A	160-Customer	160-Customer Leader	Full Time	\$155	\$559	\$621	\$686	\$596	\$581	\$552	\$459	\$642	\$581	\$642	\$489	\$6,563
NYSELEC			200-Exec Director-US	160-Customer Leader	Full Time	\$140												\$140
NYSELEC	71024213	VP Market Development	160-Customer	160-Market Development	Full Time								\$1,747	\$1,437	\$1,553	\$1,320	\$1,553	\$7,611
NYSELEC			180-New Energy Solutions	160-Market Development	Full Time								\$388					\$5,708
NYSELEC			230-Jurisdictions-RI	160-Market Development	Full Time			\$356	\$932	\$1,553	\$1,670	\$1,165						\$356
NYSELEC	71024806	Lead Analyst	160-Customer	110-Electric Process & Engineering	Full Time	\$620	\$429	\$633	\$700	\$366								\$2,748
NYSELEC	71025725	Dir Cust Trans Systems	160-Customer	160-Process & Performance	Full Time	\$305	\$343											\$647
NYSELEC	71025887	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$259	\$493	\$441	\$623	\$457	\$479	\$503	\$500	\$550	\$455	\$407	\$359	\$5,526
NYSELEC	71026501	Coordinator	160-Customer	160-Customer Engagement	Full Time	\$125	\$102	\$106	\$106	\$118	\$112	\$112	\$109	\$103	\$127	\$121	\$121	\$1,363
NYSELEC	71030136	Lead Analyst	160-Customer	160-Customer Engagement	Full Time	\$31	\$153		\$275	\$103	\$241	\$172	\$212	\$141	\$176	\$106	\$247	\$1,857
NYSELEC	71033150	Manager	160-Customer	160-Advanced Data & Analytics	Full Time							\$194	\$133					\$327
NYSELEC	71060604	VP Process & Performance	160-Customer	160-Process & Performance	Full Time	(\$548)												(\$548)
NYSELEC	71062292	Prin Analyst	160-Customer	160-Process & Performance	Full Time				\$158	\$95	\$190	\$63	\$117	\$124	\$57	\$76	\$11	\$892
NYSELEC	71066735	Lead Analyst	160-Customer	160-Advanced Data & Analytics	Full Time			\$797	\$278	\$14	\$138	\$138	\$152	\$85	\$184	\$236	\$236	\$2,258
NYSELEC	71070097	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$328	\$631	\$667	\$800	\$654	\$639	\$538	\$653	\$627	\$662	\$627	\$435	\$7,261
NYSELEC	71070107	Manager	160-Customer	180-VP New Energy Solutions	Full Time	\$160	\$301	\$38	\$50		\$25	\$240	(\$209)					\$604
NYSELEC	71073292	Lead Analyst	160-Customer	160-Process & Performance	Full Time				\$201	\$174	\$174	\$174	\$591	\$145	\$127	\$154	\$154	\$1,896
NYSELEC	71073580	Lead Analyst	160-Customer	160-Customer Assurance	Full Time	\$1,848	\$1,325	\$1,030	\$1,472	\$1,325	\$1,619	\$1,360	\$1,451	\$1,298	\$1,473	\$1,451	\$1,335	\$16,986
NYSELEC	71095359	Exec Asst to Band B	160-Customer	160-Sales & Program Operations	Full Time			\$488	\$346	\$214	\$313	\$329	\$289	\$330	\$321	\$287	\$287	\$3,202
NYSELEC			180-New Energy Solutions	160-Sales & Program Operations	Full Time		\$72	\$251										\$323
NYSELEC	72000522	Lead Analyst	160-Customer	160-Advanced Data & Analytics	Full Time		\$246	\$401	\$298	\$259	\$262	\$248	\$260	\$236	\$124			\$2,334
NYSELEC	72001338	Lead Analyst	160-Customer	160-Process & Performance	Full Time				\$209	\$174	\$174	\$174	\$182	\$191	\$182	\$191	\$136	\$1,613
NYSELEC	72002849	Coordinator	160-Customer	160-Customer Engagement	Full Time	\$284	\$532	\$310	\$547	\$812	\$15	\$620	\$2,156	\$282	\$475	\$231	\$590	\$6,855
NYSELEC	72004733	Sr Analyst	320-US Finance	320-Finance Operations	Full Time	\$741	\$351	\$1,107	\$719	\$686	\$359	\$1,013	\$686	\$719	\$654	\$686	\$98	\$7,821
NYSELEC	72004795	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time							\$28	\$143	\$206	\$204	\$192	\$157	\$930
NYSELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$78	\$135	\$135	\$81						\$429
NYSELEC	72005766	Assoc Analyst	160-Customer	160-Market Development	Full Time	\$2,443	\$2,062	\$2,387	\$2,170	\$2,170	\$2,496	\$2,062	\$1,661	\$2,333	\$2,628	\$1,682	\$1,682	\$25,779
NYSELEC	72005965	VP Marketing & Cust Experience	160-Customer	160-Customer Engagement	Full Time	\$329	\$359	\$320	\$460	\$406	\$460	\$402	\$454	\$432	\$346	\$432	\$238	\$4,636
NYSELEC	72006011	Manager	160-Customer	160-Process & Performance	Full Time				\$131	\$107		\$119	\$125	\$134	\$140	\$120	\$114	\$1,115
NYSELEC	72006077	Category Manager	160-Customer															

Segment	Personnel ID	Personnel Job Title	L03 Originating Cost Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYELEC	72007812	Manager	160-Customer	160-Customer Engagement	Full Time	\$626	\$297	\$329	\$344	\$313	\$297	\$329	\$332	\$348	\$316	\$332	\$269	\$4,133
NYELEC	72008466	Lead Economist	160-Customer	160-Advanced Data & Analytics	Full Time				\$108		\$149	\$260	\$248	\$273	\$153	\$35	\$25	\$1,252

Segment	Personnel ID	Personnel Job Title	L03 Originating Cost Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total		
NYELEC	72008589	Sr Analyst	160-Customer	160-Market Development	Full Time	\$864	\$2,221	\$2,097	\$2,503	\$2,344	\$2,327	\$2,468	\$2,900	\$3,145	\$3,002	\$2,471	\$2,328	\$28,668		
NYELEC	72009276	Exec Asst to Band B	160-Customer	160-Energy Procurement	Full Time					\$159	\$174	\$155	\$157	\$142	\$149	\$145	\$134	\$1,214		
NYELEC	72010030	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,682	\$5,734	\$5,879	\$6,677	\$5,806	\$4,645	\$5,806	\$6,016	\$6,016	\$5,715	\$6,376	\$6,376	\$69,730		
NYELEC	72010211	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,935	\$5,516	\$6,097	\$6,677	\$5,806	\$6,387	\$6,423	\$6,016	\$602	\$4,813	\$7,048	\$6,376	\$66,697		
NYELEC			320-US Finance	320-Shared Services	Full Time									\$4,662				\$4,662		
NYELEC	72010315	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$4,935	\$2,903	\$8,419	\$6,677	\$5,806	\$6,097	\$5,226	\$6,317	\$5,114	\$6,317	\$6,665	\$6,712	\$71,188		
NYELEC	72010499	Analyst	160-Customer	160-Customer Engagement	Full Time	\$87	\$87				\$279		\$203					\$656		
NYELEC	72012148	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$4,231	\$5,193	\$8,462	\$8,524	\$5,481	\$3,221	\$4,327	\$6,209	\$6,111	\$6,209	\$6,111	\$6,066	\$70,145		
NYELEC	72013721	Sr Project Manager - Ops	160-Customer	160-Process & Performance	Full Time				\$180	\$163	\$155	\$139	\$149	\$140	\$165	\$157	\$149	\$1,397		
NYELEC	72013753	Category Manager	450-Global Procurement	450-Procurement Strategy	Full Time											\$490	\$245	\$735		
NYELEC	72014134	Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time					\$48	\$121	\$137	\$118	\$135		\$139	\$139	\$837		
NYELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$67	\$115	\$73							\$254		
NYELEC	72014227	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$535	\$1,012	\$1,430	\$1,031	\$2,082	\$603	\$183	\$472	\$515	\$330	\$329	\$682	\$9,204		
NYELEC	72014277	Sr Analyst	160-Customer	160-Customer Engagement	Full Time				\$14			\$7	\$7	\$14	\$7	\$55	\$7	\$111		
NYELEC	72014347	Analyst	160-Customer	160-Market Development	Full Time										\$69			\$69		
NYELEC	72015776	Seasonal Intern	160-Customer	160-Sales & Program Operations	Part Time					\$720	\$2,448	\$2,736	\$1,563					\$7,467		
NYELEC	72016715	Intern	160-Customer	160-Market Development	Part Time						\$2,188	\$2,969	\$1,721	\$366	\$220	\$951		\$8,415		
NYELEC		Manager	450-Global Procurement	450-Procurement Ops-US	Part Time					\$242	\$258							\$501		
NYELEC	72017186		160-Customer	160-Advanced Data & Analytics	Full Time							\$102	\$221	\$256	\$198	\$233	\$221	\$1,231		
NYELEC			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$125	\$193	\$241	\$128						\$686		
NYELEC	72017590	Sr Analyst	160-Customer	160-Market Development	Full Time	\$3,684	\$2,679	\$2,538	\$2,335	\$2,379	\$3,196	\$3,058	\$1,960	\$3,431	\$3,104	\$3,022	\$2,777	\$34,164		
NYELEC	72017846	Analyst	160-Customer	160-Market Development	Full Time	\$2,441	\$3,047	\$2,216	\$3,185	\$2,770	\$3,047	\$2,814	\$2,893	(\$4,159)	(\$579)			\$17,674		
NYELEC	72019483	Dir Customer Engagement	160-Customer	160-Customer Engagement	Full Time			\$6	(\$6)				\$249	(\$249)				\$0		
NYELEC	72019836	Sr Analyst	160-Customer	160-Customer Engagement	Full Time					\$289	\$305	\$281	\$168	\$469	\$251	\$503	\$503	\$2,770		
NYELEC	72020068	Project Manager - Ops	180-New Energy Solutions	180-VP New Energy Solutions	Full Time											\$64		\$64		
NYELEC	72020680	Seasonal Intern	160-Customer	160-Customer Engagement	Full Time						\$378	\$313	\$313	\$165				\$1,168		
NYELEC	72021158	Lead Analyst	160-Customer	160-Market Development	Full Time						\$743	\$5,200	\$4,997	\$4,759	\$4,997	\$5,235	\$3,712	\$29,642		
NYELEC	72022024	Specialist	160-Customer	160-Customer Engagement	Full Time										\$61	\$52	\$121	\$234		
NYELEC	72022049	Sr Analyst	160-Customer	160-Customer Engagement	Full Time								\$46	(\$46)				\$0		
NIMO Electric Total						\$215,544	\$238,954	\$264,176	\$300,577	\$243,324	\$270,420	\$251,463	\$242,917	\$239,124	\$241,249	\$243,438	\$213,242	\$2,964,429		
Employee Count						107	107	108	124	121	127	130	130	128	123	132	120			
Time Not Worked Adjustments						\$100,971	\$63,853	\$37,580	\$16,327	\$44,801	\$50,757	\$42,451	\$43,785	\$36,408	\$43,356	(2)	\$44,704	\$32,690	(2)	\$557,683
						(\$7,622)	(\$163)	\$5,400	(\$76,338)	\$20,920	\$31,763	(\$390)	\$17,542	(\$24,707)	\$5,990		\$23,745	(\$17,907)	(\$21,767)	
						\$308,892	\$302,644	\$307,156	\$240,566	\$309,045	\$352,940	\$293,524	\$304,244	\$250,826	\$290,595		\$311,887	\$228,024	\$3,500,344	
Pension and OPEB						\$28,480	\$32,397	\$37,146	\$28,069	\$31,030	\$35,290	\$30,571	\$30,875	\$26,618	\$29,569		\$28,972	\$21,923	\$360,940	
Benefits-FAS106 (1)																				
Benefits-Pension (1)						\$59,072	\$68,159	\$76,398	\$53,465	\$65,452	\$75,871	\$61,683	\$65,023	\$52,049	\$57,918		\$65,062	\$46,952	\$747,104	
Other Benefits						\$837	\$4,923	\$7,061	(\$714)	(\$485)	\$1,137	\$1,009	\$988	\$897	\$319		\$327	\$245	\$16,544	
Benefits-FAS112 (1)						\$1,672	\$1,942	\$2,153	\$2,325	\$2,873	\$3,396	\$2,757	\$2,919	\$2,319	\$2,828		\$3,142	\$2,287	\$30,613	
Benefits-Group Life (1)																				
Benefits-Health Care (1)						\$34,397	\$39,544	\$62,444	\$38,369	\$45,615	\$52,494	\$43,422	\$45,221	\$36,976	\$44,685		\$48,464	\$35,398	\$527,029	
Benefits-Payroll Tax (1)						\$17,968	\$20,599	\$31,245	\$22,589	\$26,886	\$30,967	\$25,600	\$26,674	\$21,792	\$24,069		\$26,223	\$19,118	\$293,730	
Benefits-Thrift Plan (1)						\$10,983	\$12,675	\$16,678	\$10,982	\$13,476	\$15,850	\$14,414	\$15,245	\$12,132	\$13,000		\$14,645	\$10,558	\$160,638	
Benefits-WorkersComp (1)						\$3,006	\$3,440	\$3,905	\$1,918	\$2,037	\$2,146	\$2,391	\$2,403	\$2,090	\$3,128		\$3,167	\$2,367	\$31,998	
Variable Pay						\$28,656	\$38,702	\$101,750	\$35,775	\$42,952	\$49,816	\$40,980	\$43,020	\$34,941	\$39,653		\$43,021	\$31,410	\$530,676	
						\$185,071	\$222,381	\$338,780	\$192,778	\$229,836	\$266,967	\$222,827	\$232,368	\$189,814	\$215,169		\$233,023	\$170,258	\$2,699,272	
NIMO Electric	Grand Total Labor costs																		\$6,199,616	

(1) Recovered in Base Rates.

(2) Increase of \$1,465 in October and \$45,152 in December for Time Not Worked accruals not included in original submission.

		L03 Originating Cost		L04 Originating Cost Center		Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
Segment	Personnel ID	Personnel Job Title	Center																
NYGASD	70000500	Dir Sales	160-Customer	160-Sales & Program Operations	Full Time	\$337													\$337
NYGASD	70000593	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$49	\$61	\$114	\$143										\$367
NYGASD	70000806	Manager	160-Customer	160-Market Development	Full Time		\$46	(\$46)				\$193	\$46				\$110		\$364
NYGASD			180-New Energy Solutions	160-Market Development	Full Time									\$98	\$83	\$120	\$74	\$0	\$375
NYGASD	70001341	VP Shaping Our Future	200-Exec Director-US	200-Shaping the Future	Full Time									\$23	\$26	\$117	(\$117)		\$50
NYGASD	70001476	Manager	160-Customer	160-Customer Engagement	Full Time	\$153	\$306	\$255	\$339	\$458	\$255	\$306	\$262	\$262	\$628	\$419	\$471		\$4,113
NYGASD	70001662	Prin Specialist	160-Customer	160-Customer Assurance	Full Time	\$142	\$772	\$240	\$307	\$266	\$282	\$240	\$247	\$247	\$267	\$289	\$75		\$3,374
NYGASD	70002311	Dir Program Strategy	160-Customer	160-Market Development	Full Time														\$8
NYGASD	70006163	Lead Analyst	160-Customer	160-Customer Assurance	Full Time		\$99	\$199	\$184	\$313	\$109	\$155	\$201	\$191	\$191	\$139			\$1,782
NYGASD			320-US Finance	160-Customer Assurance	Full Time	\$153	\$206	\$96											\$455
NYGASD	70006172	Sr Analyst	160-Customer	160-Customer Assurance	Full Time	\$100	\$143	\$127	\$163	\$153	\$102	\$92	\$141	\$148	\$147	\$169	\$149		\$1,633
NYGASD	70006889	Dir Human Resources Projs	180-New Energy Solutions	310-HR SVP	Full Time											\$230			\$230
NYGASD	70011390	Lead Consultant	330-Total US IS	330-US IS	Full Time	\$75	\$86	\$80	\$102	\$54	\$75	\$59	\$48	\$80	\$70	\$80	\$64		\$874
NYGASD	70011699	Sr Analyst	160-Customer	160-Customer Assurance	Full Time	\$2	\$2	\$4	\$4	\$1	\$40			\$6		\$1			\$60
NYGASD	70015747	Lead Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$372	\$144	\$215	\$236	\$233	\$164	\$174	\$183	\$182	\$172	\$226	\$115		\$2,416
NYGASD	70016431	Dir Account Mgt	160-Customer	160-Sales & Program Operations	Full Time									\$337	\$276	\$251	\$33		\$898
NYGASD	70017004	Lead Analyst	160-Customer	160-Market Development	Part Time	\$1,832	\$1,783	\$2,327	\$2,179	\$1,684	\$1,486	\$990	\$1,618	\$2,284	\$2,237	\$2,617	\$1,718		\$22,756
NYGASD	70017226	Principal Economist	160-Customer	160-Advanced Data & Analytics	Full Time									\$18	\$28	\$17	\$15	\$20	\$98
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time		\$7	\$18	\$28	\$22	\$28	\$33	\$6						\$142
NYGASD	70017228	Sr Representative	160-Customer	160-Customer Assurance	Full Time	\$643	\$1,168	\$281	\$3,370	\$5,515	\$5,547	\$4,135	\$5,729	\$4,994	\$4,637	\$6,722	\$6,091		\$48,831
NYGASD	70017739	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$279				\$44	\$193	\$140	\$157	\$184	\$140	\$193	\$123		\$1,455
NYGASD	70018853	Prin IT Engineer	330-Total US IS	330-IS Digital Risk & Security	Full Time							\$117	\$5	\$27	\$5	\$3	\$9		\$167
NYGASD	70019394	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$4,201	\$399	\$441	\$483	\$357	\$441	\$336	\$317	\$444	\$360	\$441	\$395		\$8,615
NYGASD	70019448	Dir IT Business Relations	330-Total US IS	330-US IS	Full Time							\$155		\$75					\$230
NYGASD	70019489	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$2,870	\$5,992	\$5,736	\$8,030	\$7,074	\$7,457	\$7,911	\$5,388	\$5,461	\$5,120	\$4,681	\$4,145		\$69,865
NYGASD	70019563	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$321		(\$19)											\$302
NYGASD	70019625	Sr Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$1,554	\$932	\$466	\$621	\$1,243	\$311	\$311	\$962	\$962		\$2,244	\$1,443		\$11,047
NYGASD	70020761	Not assigned	160-Customer	160-Sales & Program Operations	Full Time	\$2,435		\$230											\$2,665
NYGASD	70021211	Lead Engineer	160-Customer	160-Sales & Program Operations	Full Time	\$1,010	\$1,818	\$2,020	\$2,323	\$1,927	\$1,919	\$1,273	\$1,867	\$1,139	\$829	\$204	\$101		\$16,429
NYGASD	70021444	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$24		\$283	\$331	\$118	\$71	\$130	\$168	\$168	\$132	\$331	\$252		\$2,008
NYGASD	70023445	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time										\$731	\$634	\$683		\$2,048
NYGASD	70023824	Lead Program Manager	160-Customer	160-Market Development	Full Time		\$3,288	\$2,219	\$452	\$82	\$822	\$329	\$1,570	\$575	\$418	\$1,254	\$418		\$11,428
NYGASD	70024656	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time						\$19	\$54	\$46	\$23					\$142
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$29	\$44	(\$7)								\$67
NYGASD	70025488	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$628	\$795	\$879	\$963	\$695	\$837	\$670	\$784	\$741	\$1,525	\$871	\$654		\$10,042
NYGASD	70025939	Lead Program Manager	160-Customer	210-JDx Executive-NY	Full Time	\$858	\$1,087	\$915	\$1,052	\$1,144	\$1,258	\$1,144	\$910	\$683	\$582				\$9,052
NYGASD			210-Jurisdictions-NY	210-JDx Executive-NY	Full Time									\$323	\$508				\$831
NYGASD	70027429	Lead Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$957	\$108	\$879	\$963	\$837	\$963	\$795	\$654	\$915	\$828	\$915	\$828		\$9,641
NYGASD	70028159	Manager	160-Customer	160-Sales & Program Operations	Full Time				\$2,103	\$2,367	\$2,276	\$2,020	\$3,355	\$1,740	\$2,485	\$1,553	\$2,578		\$20,478
NYGASD	70030626	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$936	\$2,042	\$221	\$213	\$149	\$744	\$1,395	\$814	\$712	\$356	\$490			\$8,071
NYGASD	70031440	Lead Representative	160-Customer	160-Sales & Program Operations	Full Time	\$1,620	\$931	\$1,621	\$1,259	\$1,247	\$1,309	\$1,184	\$827	\$1,336	\$1,272	\$1,082	\$700		\$14,288
NYGASD	70031774	Lead IT Architect	330-Total US IS	330-US IS	Full Time	\$186	(\$53)	\$53	\$27		\$106	\$53	\$27	\$54					\$480
NYGASD	70032014	Dir Strategic Communication	460-Corporate Affairs	460-Strategic Communications	Full Time	\$3,540	\$5,605	\$6,195	\$6,785	\$11,106	\$12,216	\$8,884	\$10,290	\$9,234	\$11,081	\$11,081	\$8,971		\$104,988
NYGASD	70032196	Lead Program Manager	160-Customer	160-Market Development	Full Time	\$1,577	\$2,390	\$1,816	\$2,868		\$143	\$48	\$390						\$9,285
NYGASD	70036545	Sr Project Manager - Ops	160-Customer	160-Sales & Program Operations	Full Time	\$743										\$551	\$260		\$743
NYGASD	70046635	Dir Sales	160-Customer	160-Sales & Program Operations	Full Time											\$224	\$364		\$811
NYGASD	70046811	Manager	330-Total US IS	330-US IS	Full Time							\$331	\$552	\$196	\$308	\$224	\$364		\$1,976
NYGASD	70046840	Exec Advisor	160-Customer	160-Customer Leader	Full Time	\$157	\$291	\$307	\$353	\$245	\$347	\$256	\$336	\$341	\$366	\$293	\$348		\$3,641
NYGASD	70048190	Lead Analyst	160-Customer	160-Market Development	Full Time											\$571	\$619		\$1,190
NYGASD	70048413	Engineer Manager	160-Customer	160-Sales & Program Operations	Full Time											\$2,946	\$404		\$3,349
NYGASD	70051586	Dir Program Strategy	160-Customer	160-Market Development	Full Time	\$968	\$3,091	\$3,457	\$2,766	\$2,766	\$3,579	\$3,417	\$1,878	\$2,311	\$1,444	\$3,467	\$3,322		\$32,466
NYGASD	70051980	Lead Program Manager	160-Customer	160-Sales & Program Operations	Full Time										\$488	\$878	\$731		\$2,097
NYGASD	70052823	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time		\$73		(\$73)										\$0
NYGASD	70053010	Manager	160-Customer	160-Customer Assurance	Full Time	(\$4)	\$222	\$245	\$245	\$245	\$187	\$234	\$252	\$204	\$228	\$252	\$240		\$2,551
NYGASD	70053795	Manager	160-Customer	160-Market Development	Full Time	\$3,325	\$1,036	\$1,036	\$981	\$1,036	\$1,090	\$1,145	\$1,067	\$907	\$472	\$1,174	\$960		\$14,228
NYGASD	70053799	Lead Program Manager	160-Customer	180-VP New Energy Solutions	Full Time	\$621	\$2,602	\$3,030	\$3,379	\$2,020	\$2,563	\$2,299							\$16,515
NYGASD			180-New Energy Solutions	180-VP New Energy Solutions	Full Time									\$2,044	\$1,258				\$3,301
NYGASD	70054601	Lead Analyst	160-Customer	160-Market Development	Full Time		\$353	\$1,172	\$1,410	\$996	\$1,181	\$1,146	\$1,511	\$902	\$1,192	\$1,468	\$1,435		\$12,766
NYGASD	70054878	Lead Planner	160-Customer	110-Electric Process & Engineering	Full Time	\$152	\$74												\$226
NYGASD	70063833	SVP Chief Customer Officer	160-Customer	160-Customer Leader	Full Time	\$279	\$525	\$652	\$121	\$1,076	\$621	\$375	\$489	\$489	\$33	\$65			\$4,724
NYGASD	70064262	Acting Coordinator	200-Exec Director-US	200-Shaping the Future	Full Time											\$44	(\$44)		\$0
NYGASD	70065318	Analyst	160-Customer	160-Process & Performance	Full Time				\$19	\$21	\$11			\$22	\$6				\$79
NYGASD	70065471	Lead Analyst	160-Customer	160-Market Development	Full Time	\$239	\$6,804	\$56	\$104			\$28	\$27	\$17					\$7,275
NYGASD	70065763	Sr Specialist	160-Customer	160-Customer Engagement	Full Time	\$210	\$438	\$462	\$531	\$462	\$613	\$514	\$428	\$500	\$497	\$462	\$386		\$5,502
NYGASD	70066620	Sr Engineer	160-Customer	160-Market Development	Full Time							\$473							\$473
NYGASD	70711341	VP New Energy Solutions	160-Customer	180-VP New Energy Solutions	Full Time					\$194	\$192								\$386
NYGASD	70711569	Lead Analyst	160-Customer	160-Customer Assurance	Full Time										\$119	\$152	\$237		\$741
NYGASD	70713142	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$1,546	\$845	\$1,190	\$1,935	\$1,495	\$1,443	\$896	\$1,316	\$1,963	\$1,691	\$1,504	\$1,548		\$17,371
NYGASD	70713192	Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$2,694	\$1,122	\$4,153	\$4,826	\$4,265	\$4,265	\$4,265	\$4,843	\$4,152	\$4,497	\$4,497	\$3,806		\$47,386
NYGASD	70713206	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$544	\$145	(\$290)											\$399
NYGASD	70713328	Sr Engineer	160-Customer	160-Market Development	Full Time							\$151	\$476	\$399	\$44	\$178	\$621	\$288	\$1,315
NYGASD			180-New Energy Solutions	160-Market Development	Full Time														\$1,021
NYGASD	70713433	Analyst	450-Global Procurement	320-Shared Services	Full Time											\$133	\$531		\$663
NYGASD	70713487	Supv Non Operations	320-US Finance	320-Shared Services	Full Time				\$7	(\$7)									\$0
NYGASD	70713490	Lead Engineer	160-Customer	160-Market Development	Full Time						\$47	\$189						\$100	\$336
NYGASD			180-New Energy Solutions	160-Market Development	Full Time								\$50				\$198		\$248
NYGASD	70713593	Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$719		\$1,717	\$695	\$695	\$899	\$858	\$595	\$670	\$707	\$781	\$744		\$9,081

Segment	Personnel ID	Personnel Job Title	L03 Originating Cost Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYGASD	70713656	Lead Program Manager	160-Customer	210-JDx Executive-NY	Full Time	\$1,315	\$1,315	\$1,079	\$1,182	\$1,028	\$1,130	\$925	\$1,034	\$1,162	\$650			\$10,821
NYGASD			210-Jurisdictions-NY	210-JDx Executive-NY	Full Time										\$207	\$138		\$346
NYGASD	70713807	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$1,562	\$575	\$1,069	\$863	\$699	\$822	\$1,274	\$1,655	\$1,497	\$993	\$426	\$1,418	\$12,853
NYGASD	71002214	Lead Analyst	160-Customer	160-Customer Assurance	Full Time	\$152	\$208	\$230	\$197	\$164	\$241	\$230	\$182	\$193	\$232	\$238	\$204	\$2,471
NYGASD	71002978	Not assigned	160-Customer	160-Process & Performance	Full Time		\$39		\$44	\$37	\$29	\$33	\$38	\$42	\$40	\$32	\$30	\$362
NYGASD	71003554	Sr Analyst	160-Customer	160-Advanced Data & Analytics	Full Time								\$14	\$5	\$26	\$17	\$234	\$295
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$2	\$2								\$5
NYGASD	71005808	Manager	160-Customer	160-Advanced Data & Analytics	Full Time	\$1,295	\$104	(\$688)	\$109	\$88	\$93	\$93	\$64	\$59	\$45	\$32	\$24	\$1,318
NYGASD	71005934	VP Sales & Sales Operation	160-Customer	160-Sales & Program Operations	Full Time		\$224	\$545	\$331	\$207	\$380	\$285	\$382	\$334	\$519	\$484	\$446	\$4,138
NYGASD	71008181	Manager	160-Customer	160-Advanced Data & Analytics	Full Time			\$44	\$37	\$55	\$81	\$86	\$93	\$75	\$84	\$89	\$89	\$731
NYGASD	71010287	Not assigned	160-Customer	160-Market Development	Full Time							\$6,183	(\$2,929)					\$3,254
NYGASD	71012567	Dir Adv Data Analytics	160-Customer	160-Advanced Data & Analytics	Full Time	\$228	\$322	\$398	\$403	\$351	\$386	\$35						\$2,123
NYGASD	71012709	Lead Analyst	160-Customer	160-Customer Assurance	Full Time	\$67	\$60											\$127
NYGASD	71014314	Dir Customer Assurance	160-Customer	160-Customer Assurance	Full Time	\$79	\$119	\$84	\$39	\$79	\$92	\$131	\$128	\$134	\$81	\$128	\$108	\$1,201
NYGASD	71015149	Sr Analyst	160-Customer	160-Advanced Data & Analytics	Full Time			\$35					\$82		\$648	\$273	\$187	\$1,225
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time			\$38	\$48	(\$12)		\$41						\$116
NYGASD	71015460	Director	160-Customer	160-Process & Performance	Full Time	\$128	\$217	\$268	\$281	\$230	\$357	\$268	\$262	(\$13)		\$131	\$170	\$2,297
NYGASD	71015650	Lead Analyst	160-Customer	160-Market Development	Full Time	\$1,521	\$1,015	\$1,535	\$1,634	\$1,164	\$1,609	\$1,634	\$1,559	\$1,523	\$1,904	\$1,999	\$1,856	\$18,953
NYGASD	71015655	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time	\$1,273	\$65	(\$450)	\$79	\$69	\$58	\$72	\$132	(\$17)	\$49	\$66	\$59	\$1,455
NYGASD	71016791	Lead Analyst	160-Customer	160-Market Development	Full Time	\$792	\$1,486	\$1,832	\$1,931	\$1,733	\$2,030	\$990	\$1,856	\$1,832	\$1,452	\$2,284	\$1,047	\$19,266
NYGASD	71017274	Lead Analyst	160-Customer	160-Customer Care	Full Time										\$87	\$38	\$28	\$153
NYGASD	71017925	Principal Quantitative Analyst	160-Customer	160-Advanced Data & Analytics	Full Time	\$1,567	\$1,418	(\$1,841)	\$132	\$86	\$112	\$106	\$111	\$79	\$127	(\$3)	\$45	\$1,938
NYGASD	71018001	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$359	\$160	\$160	\$176	\$164	\$167	\$184	\$160	\$184	\$167	\$162	\$79	\$2,121
NYGASD	71018094	Dir Special Events	160-Customer	160-Customer Engagement	Full Time	\$105	\$199	\$215	\$83	\$365	\$249	\$168	\$235	\$133	\$265	\$166	\$2,431	\$2,431
NYGASD	71018133	Dir Energy Products Marketing	160-Customer	160-Customer Engagement	Full Time	\$549	\$274	\$294	\$517	\$392	\$461	\$398	\$419	\$471	\$422	\$386	\$356	\$4,941
NYGASD	71018166	Sr Analyst	160-Customer	160-Customer Engagement	Full Time		\$40	\$40	\$804	\$1,125	\$1,446	\$1,487	\$1,257	\$1,173	\$1,090	\$1,341	\$1,215	\$11,019
NYGASD	71018196	Dir Bus Process Adv Analytics	160-Customer	160-Advanced Data & Analytics	Full Time									\$58	\$93	\$91	\$89	\$331
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$36	\$55	\$80	\$73	\$58	\$33				\$334
NYGASD	71018207	SVP Chief Customer Office	200-Exec Director-US	200-Exec Director-US	Full Time	\$434	\$393	\$434	\$229									\$1,491
NYGASD	71018644	Lead Analyst	160-Customer	160-Customer Engagement	Full Time	\$59	\$24								\$35	\$58	\$46	\$221
NYGASD	71019978	Lead Quantitative Analyst	160-Customer	160-Advanced Data & Analytics	Full Time	\$1,017	\$1,597	(\$2,350)	\$39	\$30	\$39	\$39	\$41	\$35	\$41	\$41	\$39	\$605
NYGASD	71019991	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time	\$61	\$89	\$99	\$108	\$94	\$99	\$75	\$90	\$95	\$41	\$50	\$81	\$981
NYGASD	71020022	Lead Analyst	160-Customer	160-Process & Performance	Full Time	\$65	\$83	\$92	\$48									\$288
NYGASD			180-New Energy Solutions	160-Process & Performance	Full Time				\$49	\$66	\$58							\$173
NYGASD	71021351	Manager	160-Customer	160-Sales & Program Operations	Full Time							\$23	\$227	(\$250)				\$0
NYGASD	71023527	Manager	160-Customer	160-Advanced Data & Analytics	Full Time	\$29	\$39	\$29	\$29	\$39	\$39	\$45	\$35	\$26	\$37	\$40	\$20	\$407
NYGASD	71023593	Prin Planner	160-Customer	110-Gas Process & Engineering	Full Time							\$23	\$49	\$49	\$41	\$44	\$44	\$251
NYGASD			200-Exec Director-US	110-Gas Process & Engineering	Full Time				\$27	\$46	\$56	\$27						\$156
NYGASD	71024127	Dir Market Development	160-Customer	160-Market Development	Full Time					\$31						\$23		\$54
NYGASD			180-New Energy Solutions	160-Market Development	Full Time						\$72	\$101						\$173
NYGASD	71024177	Exec Asst to Band A	160-Customer	160-Customer Leader	Full Time	\$42	\$152	\$169	\$180	\$157	\$153	\$145	\$120	\$169	\$152	\$169	\$128	\$1,736
NYGASD			200-Exec Director-US	160-Customer Leader	Full Time	\$38												\$38
NYGASD	71024213	VP Market Development	160-Customer	160-Market Development	Full Time								\$459	\$377	\$408	\$347	\$408	\$1,998
NYGASD			180-New Energy Solutions	160-Market Development	Full Time				\$245	\$408	\$438	\$306	\$102					\$1,498
NYGASD			230-Jurisdictions-RI	160-Market Development	Full Time			\$97										\$97
NYGASD	71024806	Lead Analyst	160-Customer	110-Electric Process & Engineering	Full Time	\$135	\$142	\$208	\$230	\$120								\$835
NYGASD	71025725	Dir Cust Trans Systems	160-Customer	160-Process & Performance	Full Time	\$83	\$93											\$177
NYGASD	71025887	Sr Analyst	160-Customer	160-Sales & Program Operations	Full Time	\$387	\$152	\$136	\$192	\$148	\$176	\$184	\$184	\$202	\$167	\$149	\$132	\$2,207
NYGASD	71026501	Coordinator	160-Customer	160-Customer Engagement	Full Time	\$31	\$33	\$31	\$31	\$35	\$33	\$33	\$32	\$30	\$38	\$36	\$36	\$398
NYGASD	71030136	Lead Analyst	160-Customer	160-Customer Engagement	Full Time	\$9	\$47		\$90	\$34	\$79	\$56	\$69	\$46	\$58	\$46	\$81	\$617
NYGASD	71060604	VP Process & Performance	160-Customer	160-Process & Performance	Full Time	(\$150)												(\$150)
NYGASD	71062292	Prin Analyst	160-Customer	160-Process & Performance	Full Time				\$28	\$17	\$33	\$9	\$23	\$22	\$13	\$13	\$2	\$161
NYGASD	71066735	Lead Analyst	160-Customer	160-Advanced Data & Analytics	Full Time			\$59	\$73	\$24	\$60	\$65	\$71	\$40	\$76	\$86	\$86	\$638
NYGASD	71070097	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$318	\$195	\$205	\$246	\$210	\$234	\$197	\$240	\$230	\$243	\$230	\$159	\$2,707
NYGASD	71071017	Manager	160-Customer	180-VP New Energy Solutions	Full Time	\$162	\$314	\$38	\$25	\$25	\$25	\$275	(\$238)					\$599
NYGASD	71073292	Lead Analyst	160-Customer	160-Process & Performance	Full Time				\$35	\$31	\$31	\$31	\$29	\$26	\$22	\$27	\$27	\$259
NYGASD	71095359	Exec Asst to Band B	160-Customer	160-Sales & Program Operations	Full Time				\$91	\$56	\$82	\$86	\$76	\$87	\$84	\$75	\$75	\$846
NYGASD			180-New Energy Solutions	160-Sales & Program Operations	Full Time		\$20	\$68										\$88
NYGASD	72000522	Lead Analyst	160-Customer	160-Advanced Data & Analytics	Full Time	\$1,369	\$86	(\$666)	\$104	\$90	\$95	\$90	\$95	\$86	\$45			\$1,392
NYGASD	72001338	Lead Analyst	160-Customer	160-Process & Performance	Full Time				\$37	\$31	\$31	\$31	\$32	\$34	\$32	\$34	\$24	\$285
NYGASD	72001587	Sr Quantitative Analyst	160-Customer	160-Advanced Data & Analytics	Full Time	\$4,820	\$4,579	\$2,169										\$11,568
NYGASD	72002849	Coordinator	160-Customer	160-Customer Engagement	Full Time	\$284	\$532	\$310	\$547	\$812	\$15	\$620	\$2,156	\$282	\$475	\$231	\$590	\$6,854
NYGASD	72004733	Sr Analyst	320-US Finance	320-Finance Operations	Full Time	\$139	\$66	\$254	\$236	\$225	\$118	\$333	\$225	\$236	\$215	\$225	\$32	\$2,304
NYGASD	72004795	Sr Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time								\$7	\$37	\$54	\$53	\$41	\$244
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$20	\$35	\$35	\$21						\$113

Segment	Personnel ID	Personnel Job Title	Center	L04 Originating Cost Center	Full / Part	Jan / 2016	Feb / 2016	Mar / 2016	Apr / 2016	May / 2016	Jun / 2016	Jul / 2016	Aug / 2016	Sep / 2016	Oct / 2016	Nov / 2016	Dec / 2016	Grand Total
NYGASD	72005766	Assoc Analyst	160-Customer	160-Market Development	Full Time	\$502	\$1,356	\$1,571	\$1,428	\$1,428	\$1,642	\$1,356	\$1,131	\$1,497	\$1,729	\$1,107	\$1,107	\$15,854
NYGASD	72005965	VP Marketing & Cust Experience	160-Customer	160-Customer Engagement	Full Time	\$82	\$112	\$94	\$135	\$118	\$129	\$112	\$126	\$120	\$96	\$120	\$66	\$1,310
NYGASD	72006011	Manager	160-Customer	160-Process & Performance	Full Time				\$23	\$19	\$22	\$21	\$51	\$55	\$58	\$50	\$47	\$345
NYGASD	72006077	Category Manager	160-Customer	450-Procurement Strategy	Full Time						\$201	(\$201)						\$0
NYGASD			450-Global Procurement	450-Procurement Strategy	Full Time											\$27		\$27
NYGASD	72006289	Sr. Process Manager	160-Customer	210-Maint & Const-NY Gas	Full Time	\$99	\$0	(\$99)	\$446	(\$446)			\$50	(\$50)				\$0
NYGASD	72006307	Tech Support Consultant	160-Customer	160-Sales & Program Operations	Full Time	\$1,656	\$1,224	\$1,512	\$1,339	\$1,109	\$2,015	\$1,440	\$1,435	\$1,435	\$1,510	\$1,194	\$1,268	\$17,135
NYGASD	72006402	Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$5												\$5
NYGASD	72007812	Manager	160-Customer	160-Customer Engagement	Full Time		\$266	\$313	\$344	\$313	\$313	\$329	\$332	\$348	\$316	\$332	\$269	\$3,476
NYGASD	72008466	Lead Economist	160-Customer	160-Advanced Data & Analytics	Full Time				\$28	\$313	\$54	\$95	\$90	\$99	\$74	\$47	\$34	\$522
NYGASD	72008589	Sr Analyst	160-Customer	160-Market Development	Full Time	\$793	\$952	\$899	\$1,093	\$1,005	\$1,058	\$1,058	\$1,266	\$1,348	\$1,286	\$1,082	\$1,021	\$12,860
NYGASD	72009235	Sr Analyst	160-Customer	160-Advanced Data & Analytics	Full Time	\$19	\$26	\$26	\$32	\$13	\$26	\$26						\$167
NYGASD	72009276	Exec Asst to Band B	160-Customer	160-Energy Procurement	Full Time					\$42	\$46	\$41						\$319
NYGASD	72010030	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$544	\$73	(\$73)					\$41	\$37	\$39	\$38	\$35	\$544
NYGASD	72010315	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time		\$2,613	(\$2,323)										\$290
NYGASD	72010499	Analyst	160-Customer	160-Customer Engagement	Full Time	\$20	\$13				\$43		\$43					\$120
NYGASD	72012148	Manager	160-Customer	160-Sales & Program Operations	Full Time	\$385	\$3,654		\$12	\$1,827	\$5,193	\$2,019	\$2,070	\$1,676	\$2,070	\$2,070	\$2,022	\$22,996
NYGASD	72012507	Sr Program Manager	160-Customer	160-Sales & Program Operations	Full Time	\$152												\$152
NYGASD	72013721	Sr Project Manager - Ops	160-Customer	160-Process & Performance	Full Time				\$32	\$29	\$27	\$24	\$26	\$25	\$29	\$28	\$26	\$247
NYGASD	72013753	Category Manager	450-Global Procurement	450-Procurement Strategy	Full Time											\$490	\$245	\$735
NYGASD	72014134	Data Scientist	160-Customer	160-Advanced Data & Analytics	Full Time						\$13	\$32	\$36	\$31	\$36	\$36		\$220
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$17	\$30	\$19							\$67
NYGASD	72014227	Sr Sales Representative	160-Customer	160-Sales & Program Operations	Full Time	\$69	\$27	\$54		\$62								\$212
NYGASD	72014277	Sr Analyst	160-Customer	160-Customer Engagement	Full Time				\$4			\$2	\$2	\$4	\$2	\$17	\$2	\$33
NYGASD	72014347	Analyst	160-Customer	160-Market Development	Full Time										\$18			\$18
NYGASD	72016715	Intern	160-Customer	160-Market Development	Part Time						\$438	\$594	\$365	\$105	\$63	\$272		\$1,835
NYGASD			450-Global Procurement	450-Procurement Ops-US	Part Time					\$48	\$65							\$113
NYGASD	72017186	Manager	160-Customer	160-Advanced Data & Analytics	Full Time							\$27	\$58	\$67	\$52	\$61	\$58	\$323
NYGASD			200-Exec Director-US	160-Advanced Data & Analytics	Full Time				\$33	\$51	\$63	\$34						\$180
NYGASD	72017590	Sr Analyst	160-Customer	160-Market Development	Full Time	\$757	\$1,005	\$952	\$1,655	\$1,493	\$1,082	\$1,112	\$735	\$1,286	\$1,164	\$1,164	\$1,041	\$13,446
NYGASD	72017846	Analyst	160-Customer	160-Market Development	Full Time	\$430	\$709	\$1,152	\$1,019	\$886	\$975	\$933	\$1,099	\$3,438	\$1,717	\$2,076	\$1,902	\$16,336
NYGASD	72019483	Dir Customer Engagement	160-Customer	160-Customer Engagement	Full Time			\$6	(\$6)				\$125	(\$125)				\$0
NYGASD	72019936	Sr Analyst	160-Customer	160-Customer Engagement	Full Time					\$121	\$217	\$261	\$231	\$515	\$289	\$59	\$1,257	\$2,950
NYGASD	72020068	Project Manager - Ops	180-New Energy Solutions	180-VP New Energy Solutions	Full Time											\$17		\$17
NYGASD	72020680	Seasonal Intern	160-Customer	160-Customer Engagement	Full Time						\$95	\$78	\$78	\$41				\$292
NYGASD	72020681	Seasonal Intern	180-New Energy Solutions	180-VP New Energy Solutions	Part Time												\$445	\$445
NYGASD	72021158	Lead Analyst	160-Customer	160-Market Development	Full Time						\$149	\$1,040	\$999	\$952	\$999	\$1,047	\$714	\$5,900
NYGASD	72022024	Specialist	160-Customer	160-Customer Engagement	Full Time												\$260	\$260
NYGASD	72022049	Sr Analyst	160-Customer	160-Customer Engagement	Full Time								\$3	(\$3)				\$0
NIMO Gas Total						\$64,888	\$75,557	\$55,258	\$72,855	\$70,669	\$83,388	\$76,955	\$74,271	\$71,901	\$71,636	\$78,632	\$68,317	\$864,327
Employee Count						90	89	92	104	102	111	109	112	110	105	113	104	
Time Not Worked Adjustments						\$24,298	\$16,544	\$7,655	(\$1,321)	\$12,588	\$20,833	\$12,848	\$11,481	\$10,986	\$11,989	\$12,841	\$11,700	\$152,442
						\$449	\$1,961	\$267	(\$57,483)	\$5,216	\$42,702	\$317	(\$5,368)	(\$5,965)	\$252	(\$822)	\$1,095	(\$17,379)
						\$89,635	\$94,062	\$63,180	\$14,051	\$88,473	\$146,922	\$90,119	\$80,384	\$76,923	\$83,877	\$90,652	\$81,112	\$999,390
Pension and OPEB						\$7,743	\$9,679	\$6,944	\$2,073	\$7,926	\$13,350	\$8,693	\$7,832	\$7,493	\$7,583	\$7,481	\$6,724	\$93,521
Benefits-Pension (1)						\$19,917	\$23,078	\$16,518	\$3,487	\$19,973	\$33,223	\$19,867	\$17,616	\$16,860	\$17,681	\$19,740	\$17,581	\$225,541
Other Benefits						\$17	\$1,582	\$1,481	(\$75)	\$32	\$394	\$261	\$238	\$228	\$86	\$87	\$79	\$4,410
Benefits-Group Life (1)						\$599	\$681	\$487	\$150	\$889	\$1,497	\$899	\$796	\$761	\$851	\$942	\$844	\$9,396
Benefits-Health Care (1)						\$10,981	\$12,958	\$13,459	\$2,601	\$13,292	\$22,143	\$13,514	\$12,033	\$11,516	\$13,049	\$14,155	\$12,622	\$152,323
Benefits-Payroll Tax (1)						\$5,498	\$6,584	\$6,574	\$1,529	\$7,850	\$13,081	\$7,979	\$7,103	\$6,798	\$7,071	\$7,705	\$6,874	\$84,646
Benefits-Thrift Plan (1)						\$3,722	\$4,306	\$3,662	\$714	\$4,127	\$6,933	\$4,686	\$4,150	\$3,972	\$3,983	\$4,456	\$3,971	\$48,682
Benefits-WorkersComp (1)						\$871	\$1,063	\$762	\$148	\$478	\$762	\$669	\$604	\$578	\$837	\$854	\$763	\$8,389
Variable Pay						\$9,276	\$13,006	\$22,097	\$2,411	\$12,755	\$21,302	\$12,948	\$11,514	\$11,019	\$11,587	\$12,584	\$11,229	\$151,728
						\$58,624	\$72,937	\$71,984	\$13,038	\$67,322	\$112,685	\$69,516	\$61,886	\$59,225	\$62,728	\$68,004	\$60,687	\$778,636
NIMO Gas Grand Total Labor costs																		\$1,778,026

(1) Recovered in Base Rates.
(2) Increase of \$10,775 for a Time Not Worked accrual not included in original submission.

Niagara Mohawk Power Corporation d/b/a National Grid
Energy Efficiency Labor Adjustment

Adjustment to EE Labor

	Rate Year FY19	Data Year FY20	Data Year FY21
<u>Electric</u>			
ETIP Forecast Labor Costs	\$4,600,000	\$4,600,000	\$4,600,000
HTY Base Labor Costs	\$4,339,021	\$4,469,191	\$4,603,267
Residual EE Adjustment	\$260,979	\$130,809	(\$3,267)

<u>Gas</u>			
ETIP Forecast Labor Costs	\$1,800,000	\$1,800,000	\$1,800,000
HTY Base Labor Costs	\$1,239,072	\$1,276,244	\$1,314,531
Residual EE Adjustment	\$560,928	\$523,756	\$485,469

HTY NY spending by cost category
From January 2016 through December 2016

Cost Category	CostElement	NYELEC	NYGASD	Total
	B0030	\$ 464,489	\$ 128,639	\$ 593,128
	B0031	\$ 7		\$ 7
	C6001300	\$ 72,299	\$ 24,265	\$ 96,565
	C6001350	\$ (6,119)	\$ (1,176)	\$ (7,295)
Burden Total		\$ 530,676	\$ 151,728	\$ 682,405
Labor	B0040	\$ 478,144	\$ 127,662	\$ 605,807
	C6001150	\$ 50,597	\$ 59,353	\$ 109,950
	C6001500	\$ 79,538	\$ 24,779	\$ 104,317
	L0010	\$ 2,891,895	\$ 787,596	\$ 3,679,491
	L0020	\$ 169		\$ 169
Labor Total		\$ 3,500,344	\$ 999,390	\$ 4,499,734
Grand Total		\$ 4,031,020	\$ 1,151,118	\$ 5,182,138
Labor Inflation				
Rate Year		\$4,339,021	\$1,239,072	7.64%
Data Year 1		\$4,469,191	\$1,276,244	3.00%
Data Year 2		\$4,603,267	\$1,314,531	3.00%

Total Energy Efficiency moved to base rates

Electric

	FY19	FY20	FY21	Total
ETIP to Base Rates	2,600,000	2,600,000	2,600,000	7,800,000
E-Commerce Marketplace	3,638,311	3,638,311	3,638,311	10,914,933
Labor	4,600,000	4,600,000	4,600,000	13,800,000
Total	10,838,311	10,838,311	10,838,311	32,514,933

Gas

	FY19	FY20	FY21	Total
Incremental EE Gas	528,000	528,000	528,000	1,584,000
E-Commerce Marketplace	1,137,073	1,137,073	1,137,073	3,411,219
Labor	1,800,000	1,800,000	1,800,000	5,400,000
Total	3,465,073	3,465,073	3,465,073	10,395,219
Grand Total	14,303,384	14,303,384	14,303,384	42,910,152

Date of Request: June 30, 2017
Due Date: July 10, 2017

Request No. DPS-455 LMR-8
NMPC Req. No. NM-1031

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Lisa Rosi
TO: National Grid, Electric Customer Panel, Gas Customer Panel
SUBJECT: **ENERGY EFFICIENCY E-COMMERCE PROGRAM**

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

For both electric and gas energy efficiency programs, provide the annual historical spending of the E-Commerce costs that NMPC proposes to move into base rates.

Response:

In 2016, the Company's spending on the Residential Efficiency Platform (E-Commerce) was \$372,504 for electric and \$190,435 for gas. These expenditures supported the initial startup and development of the program.

As discussed by the Electric and Gas Customer Panels at pages 34 to 37 and 11 to 14, respectively, the Company proposes to shift the costs of the E-Commerce Platform from the ETIP (\$3.640 million for electric and \$1.137 million for gas) to base rates. The costs include program related expenses.

Name of Respondent:
Lisa Tallet

Date of Reply:
July 10, 2017

Date of Request: July 7, 2017
Due Date: July 17, 2017

Request No. DPS-525 LMR-9
NMPC Req. No. NM-1104

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Lisa Rosi
TO: National Grid, Electric Customer Panel
SUBJECT: **ENERGY EFFICIENCY EM&V COSTS**

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

During EEPS, the most NMPC spent in any one year for EM&V was \$1.30 million for electric and \$0.35 million for gas. The Company is requesting EM&V budgets of \$2.60 million for electric and \$0.53 million for gas to be placed into base rates. Provide a detailed explanation regarding the need for additional EM&V budgets above the historical EM&V spending levels experienced during EEPS.

Response:

The requested evaluation, measurement and verification (“EM&V”) budgets of \$2.60 million for electric and \$0.53 million for gas represent cost shifts from the ETIP to base rates. The approved ETIP EM&V budgets have generally represented five percent of the total annual ETIP budgets for electric and gas. The historical expenditures for years 2012 through 2015 reflect activities associated with completion of EEPS EM&V studies as approved by Staff.

Historically, the Company’s EM&V budgets included activities that supported energy efficiency programs only. The Company is proposing to expand the scope of its current EM&V activities to a much broader scale that would include things such as distributed energy resources and other market transformation activities. As outlined in the Clean Energy Guidance document, CE-05:

Evaluation, Measurement & Verification Guidance,¹ the Company will explore and place high priority on EM&V activities that target those programs, measures, or technologies that defer infrastructure investment (*e.g.*, non-wires alternatives (“NWA”) solutions); are eligible for Earning Adjustment Mechanisms (“EAMs”); are being conducted on a pilot or REV demonstration basis; have high energy savings variability; and/or are based on a limited existing knowledge basis. The Company may also explore the use of advanced M&V tools as it is anticipated that there will be increased emphasis on M&V to yield more timely results for the aforementioned programs, measures, and technologies. In expanding EM&V into these new areas, there is an anticipated need for funding above the historical EM&V spending levels.

Name of Respondent:

Lisa Tallet

Date of Reply:

July 17, 2017

¹ CE-05: Evaluation, Measurement & Verification Guidance, Version 1.0, New York State Department of Public Service – Office of Clean Energy (dated November 1, 2016).

Date of Request: July 11, 2017
Due Date: July 21, 2017

Request No. DPS-550 RAC-9
NMPC Req. No. NM-1136

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID
Case No. 17-E-0238 and 17-G-0239 –
Niagara Mohawk Power Corporation d/b/a National Grid – Electric and Gas Rates

Request for Information

FROM: DPS Staff, Robert Cully

TO: National Grid, Electric Customer Panel

SUBJECT: **DEMONSTRATION PROJECTS: FOLLOW UP TO DPS-325**

Request:

In all interrogatories, all requests for workpapers or supporting calculations shall be construed as requesting any Word, Excel, or other computer spreadsheet models in original electronic format with all formulae intact and unlocked.

Refer to the Company's response to DPS-325, and Attachment 4 thereto. Is it NMPC's understanding that the Order Adopting Regulatory Policy Framework and Implementation Plan, issued February 26, 2015 in Case 14-M-0101, established an annual revenue requirement cap for Demonstration Project spending, instead of a total budget cap on all Demonstration Project spending?

Response:

Yes, the Company's understanding is that the Commission's "Order Adopting Regulatory Policy Framework and Implementation Plan," issued February 26, 2015 in Case 14-M-0101, established an annual revenue requirement cap for demonstration projects. The Company's understanding is based on the language found on page 116 (including footnote 111) of the Order describing the cap on demonstration project costs. As stated on page 116, the utilities would be limited to the greater of 0.5% of their delivery service revenue requirement or the revenue requirement associated with capital expenditures of \$10 million in project costs. Based on this language, it is reasonable to assume that the revenue requirement cap is an annual threshold, as the revenue requirements on project costs would equate to a revenue requirement each year.

Name of Respondent:
Nick Corsetti
Joan Godlewski

Date of Reply:
July 21, 2017

SCHEDULE 1: DEMONSTRATION PROJECTS BUDGET DEVELOPMENT

Budget Based on 0.5% of Delivery Service Revenues			
Carrying Charge Rate	Formula	Amount	Source
Recovery of Investment*	(1)	10%	Track 1 Order, pg. 116
Pre-Tax WACC	(2)	9.79%	DPS-325, Att-1
Carrying Charge Rate	(3)=(1)+(2)	19.79%	
Delivery Revenue Requirement	(4)	\$ 1,738,144,000	DPS-325, Att-1
Authorized Percentage	(5)	0.50%	Track 1 Order, pg. 116
Revenue Requirement	(6)= (4)*(5)	\$ 8,690,720	
Total Budget	(7)=(6)/(3)	\$ 43,914,704	
* Recovery of Investment reflects a 10 year amortization (10% a year)			

SCHEDULE 2: DEMONSTRATION PROJECTS BUDGET AND EXPENDITURES

Project Name	Capital	O&M	Total	Source
Demand Reduction (Clifton Park)	\$ 10,453,176	\$ 16,366,160	\$ 26,819,336	DPS-325 Q1
Distributed System Platform (DSP)	\$ 4,425,000	\$ 645,000	\$ 5,070,000	DPS-325 Q1
Neighborhood Solar (Fruit Belt)	\$ 1,410,000	\$ 2,382,200	\$ 3,792,200	DPS-325 Q1
Community Resilience - Potsdam	\$ -	\$ 1,606,000	\$ 1,606,000	DPS-325 Q1
Smart Home Rate	\$ -	\$ 795,000	\$ 795,000	DPS-325 Q3&4
Distributed Generation Interconnection	\$ -	\$ -	\$ -	DPS-325 Q3&4
TOTAL	\$ 16,288,176	\$ 21,794,360	\$ 38,082,536	
Total Expenditures To-Date	\$ 38,082,536			
Total Budget Authorization	\$ 43,914,704			
Remaining Budget Authorization	\$ 5,832,168			

Company	Program	FTEs *	MW Enrolled **
Con Edison	CSRP	5	177
	DLRP		238
	DLC	3	39
	TOTAL	8	454
	MW/FTE		56.75
NMPC	CSRP		140
	DLRP		0
	DLC		0.5
	TOTAL		140.5
# FTEs required			2.5

* Source: Case 16-E-0060, 2016 Con Edison Rates, Exhibit __ (SEFP-1) at pg 25.

** Source: Case 09-E-0115, Con Edison Demand Response, Consolidated Edison Company of New York, Inc. Report on Program Performance and Cost Effectiveness of Demand Response Programs.