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April 18, 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)

RFP FOR NON-WIRES ALTERNATIVE SOLUTIONS FOR OLD FORGE, NEW YORK AREA

Dear Secretary Burgess:

In accordance with the requirements of New York Public Service Law (“PSL”) Section 27, Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid”) hereby submits for filing in Case 14-M-0101 the Request for Proposal (“RFP”) for Non-Wires Alternative (“NWA”) Solutions for an area of electrical stress in Old Forge, New York area to be issued by April 19, 2017. With this RFP National Grid is soliciting proposals for NWA solutions defined as Phase II – NWA Solutions Solicitation within the attached RFP Scope of Work document.

Please direct any questions regarding this RFP to:

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Hon. Kathleen H. Burgess, Secretary
National Grid: Non-Wires Alternative Solutions for Old Forge, New York Area
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Thank you.

Respectfully submitted,

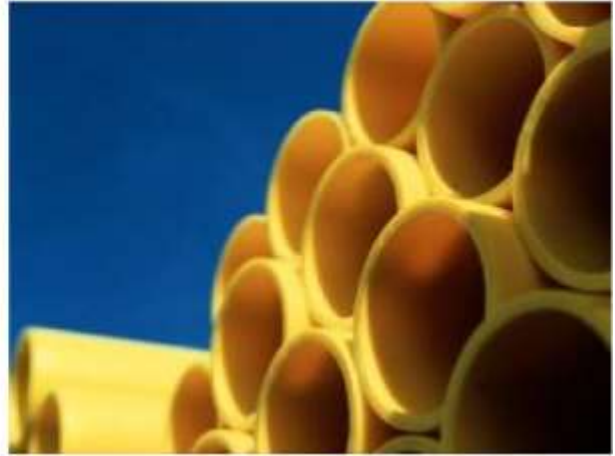
/s/ Janet M. Audunson

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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)
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nationalgrid



Request for Proposal (RFP)

**Non- Wires Alternative Solutions
Project Development Services**

*RFP Scope of Work
(SOW)
April 18, 2017*

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1 Introduction

National Grid is a gas and electric investor-owned utility serving nearly 3.3 million electric and 3.5 million gas customers through its subsidiary companies in Massachusetts, New York and Rhode Island.

National Grid is committed to providing safe, reliable and affordable energy to all customers throughout our service territory. As a part of providing this service, National Grid is pursuing the potential implementation of Non-Wires Alternatives solutions in Upstate NY. Such implementation aligns with principles set forth by the NYS PSC Case 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision (REV).

National Grid has been pursuing Non-Wires Alternative Projects (“NWA’s”) across its service territories since 2011. Demand Response, solar, Combined Heat and Power (CHP), microgrid and other Distributed Energy Resources (DERs) have been studied and in some cases implemented in pilot projects intended to defer traditional electrical distribution equipment upgrades or “wires projects.” National Grid has identified an area of electrical stress located in and around Old Forge, NY, a relatively remote area fed from a sub-transmission line starting north of Utica and ending near Raquette Lake. The Company has filed with the NYS Public Service Commission to pursue potential relief of this area through the implementation of Non-Wires Alternatives Solutions (Old Forge Report).

2 Definitions

“Non-Wires Alternatives” (“NWA”), is the umbrella term for ensuring that a portfolio of alternatives to distribution and/or transmission lines is analyzed and considered in the planning and possible permitting of such facilities.

A NWA could include any action or strategy that could help defer or eliminate the need to construct or upgrade components of a transmission and/or distribution system affected by loading that is estimated to exceed equipment limits.

NWA’s are defined and referred to as any demand response, distributed generation, conservation or energy efficiency measure, generation altering pricing strategies that individually or in combination delay or eliminate need for upgrades to transmission and/or distribution system.

3 Our Goals

This Request for Proposal (“RFP”) seeks to identify specific market based DER proposals that, if implemented, would provide NWA Solutions for an area of electrical stress located in the Old Forge, New York area.

To assist qualified bidders this document provides an overview of the project objectives, detailed business requirements and proposal submission information.

As outlined in the RFP Schedule section of this document, bidders will have the opportunity to submit questions that assist in creating a proposal for this initiative. Please see the RFP Timeline Schedule for dates associated with RFP milestones below. The specific delivery terms and conditions will be worked out with the vendor in a formal contract following award notification.

4 NWA Phases

There are five main components or “phases” of developing and delivering NWA Solutions. This RFP is specifically covering and requesting detail only on Phase II of the process as described.

1. Phase I (Complete) - High Level Screening Study

- Create a demographic analysis of the identified area
- Evaluate the potential that NWA measures may be likely to replace or defer the need for the proposed transmission/distribution project
- Identify technology categories that may be a best fit to address the specific capacity constraints in the defined area
- Support the development of appropriate documentation to solicit solution measures from the market through a competitive process

2. Phase II - NWA Solutions Solicitation (This RFP Phase)

- **Document/Bid NWA Solutions that are responsive to the local electric system needs as defined in the Old Forge Report**
- **Determine the implementation requirements to utilize the NWA Solution most cost effectively to address electric system needs**
- **Determine availability and reliability of available NWA**
- **Identify all costs and benefits**
- **Determine availability of resources and time to implement**
- **Identify Project/Program Management requirements to implement each proposal, including roles and responsibilities of all parties**
- **Leverage available State and Federal solution funding**

3. Detailed Solutions Evaluation & Procurement (Phase III)

- Evaluate the feasibility of the proposals received by solution providers received in phase II
- Assess the impact of DER proposals on the local area load forecast
- Update power flow model with proposed DER solutions and evaluate impacts on power system performance
- Develop an optimal portfolio of wires and non-wires solutions to resolve the system constraints.

4. Management/Oversight of NWA Solution Measures (Phase IV)

- Project management of the NWA
- Deployment of selected solution measures
- Periodic reporting on progress

5. NWA Performance Assessment (Phase V)

- Evaluate the capacity and reliability impacts of the deployed solution measures
- Evaluate the economic impact of the deployed solution measures
- Identify risks and their impacts on the load relief
- Discuss warranties of load relief/reward and penalties for not delivering

5 Project Overview: Old Forge, NY

The sub-transmission line (46kV) from Alder Creek to Raquette Lake substations has experienced a number of faults resulting in outages. The system is interrupted for any single contingency as it is of radial configuration with N-0 criteria. Due to the proximity to the Adirondack State Park portion of State Route 28, motor vehicle accidents as well as tree trimming and clearing are a problem.

In addition, two substation transformers feeding the area are forecasted to exceed their normal loading by 2030. Please see growth projections in the Old Forge Report.

Please see the Old Forge Report document for detailed information about the Old Forge NWA area.

6 Deliverables and Main Tasks

This section describes the list of tasks and deliverables required for the bidder. Please provide detail in your proposal as to how you your firm can perform each of the tasks below. All tasks should be responded to in the context of the NWA in the Old Forge Report.

Phase II

- Clearly define the specific NWA Solutions included in the proposal (such as solar and storage, CHP, EE, expansion/enhancement of current Demand Response/Direct Load Management offering, new and/or undefined solutions, etc.) that are responsive to electric system needs as described in the Old Forge Report
- Provide complete operating descriptions for each type of DER included that details the minimum and maximum level of load reduction available, the possible duration of relief, the frequency at which each DER can be called upon reliably, and any constraints that would impact the availability of each resource.
- Define the implementation requirements to utilize the NWA Solution most cost effectively to address electric system needs, including, but not limited to:
 - Forecasting and Event Notification process
 - Integration with utility monitoring, communications and control systems
 - Means of measurement and verification
- Describe other uses for the proposed DER and any constraints those uses may have on the availability of the resource for the use in response to electric system needs
- Clearly describe the expected benefits of utilizing the proposed DER as a NWA Solution, propose remuneration methods, and provide an economic model that describes the expected revenue stream for each DER to compensate for those benefits.
- Describe in detail how the proposed NWA integrates, or aligns with, existing programs such as Energy Efficiency and Demand Response. See the attached documents outlining Energy Efficiency and Demand Response program information
- Provide a schedule of DER availability that defines the magnitude of NWA available (KW) by May 1st of each year compared to Cumulative need as shown in Attachment A.
- Describe Project/Program Management requirements to implement each proposal, including roles and responsibilities of all parties.
- Provide evidence of previous experience and references for similar projects
- Leverage available State and Federal solution funding

7 Instructions for Bidders

7.1 Proposal

Please provide a concise written proposal under 50 pages (excluding resumes, white papers, etc.) for ease of review. There will be sections to upload additional documents on our website. In your proposal please provide an introduction of your company, size, staff for this project, and any partners you may be working with. Please describe the staff and experience of the employees that will be working directly with National Grid.

7.2 Timeline

Please provide a detailed timeline outlining major milestones for the main deliverables for the tasks your firm are bidding on.

7.3 Previous Experience

Please describe within your proposal any previous experience with these services, along with possible references.

7.4 Partnering

If your firm wishes to bid on only one of the components of this RFP and is looking to partner please let us know if you wish to share your contact information with the other bidders of this RFP. We can then post your contact information for the other bidders who are also willing to share their information. This may help with collaboration and provide opportunities to firms that may not already know or have a partner that provides one or more of the services requested in this scope of work.

7.5 RFP Schedule (Estimated and subject to change)

- RFP Launch: 4/18/17
- Bidders Conference Call: 4/26/17 (approximate)
- Last date to submit questions: 5/22/17
- Proposals Due: 05/26/2017
- Possible Interviews: 6/19/2017 (approximate)

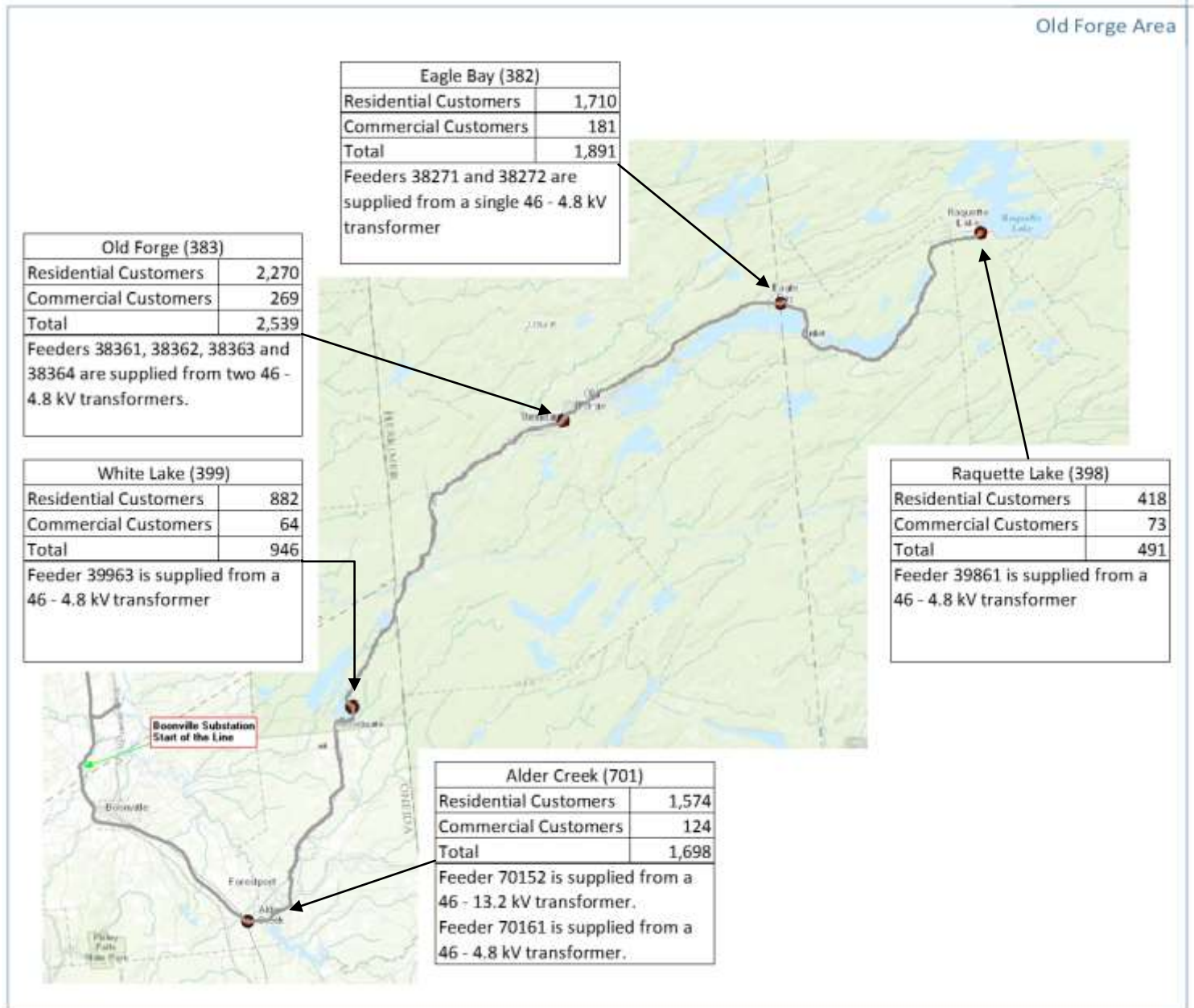
Estimated Award Date 6/30/2017

OLD FORGE AREA REPORT

Potential for Non-Wires Alternative projects in Old Forge, NY

CURRENT CONDITIONS

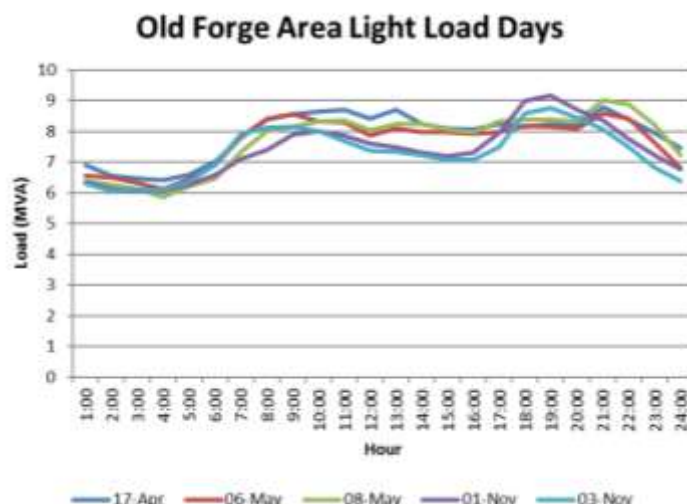
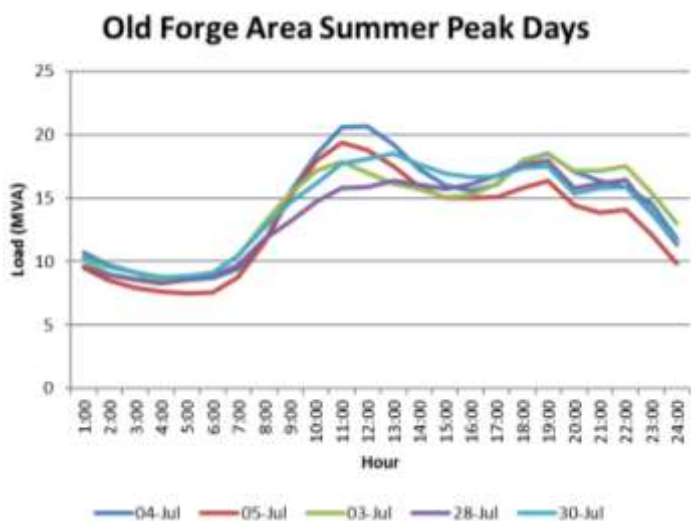
Five substations serving an area in Central New York north of the City of Utica, are experiencing line reliability performance and substation/feeder capacity issues. The substations are supplied by a single 46kV line that begins in Boonville, continues through Forestport into Adirondack Park and follows State Route 28 until it terminates at Raquette Lake. This line traverses through some of the more remote communities in New York State. As part of NY REV guidance order, National Grid is seeking NWA solutions that could potentially provide delivery infrastructure avoidance value or other reliability and operational benefits. These solutions could connect to a circuit, load, one of five distribution substations or the 46kV line, collectively called "Old Forge Area". A simplified representation of the described Electric System, is shown below.

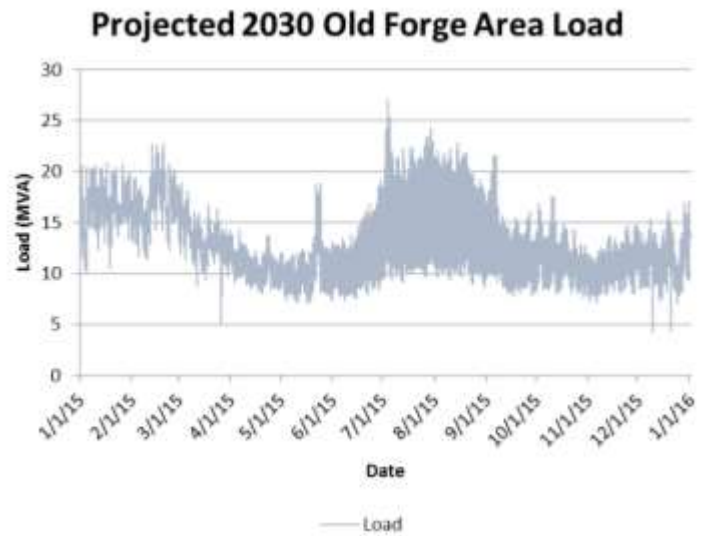
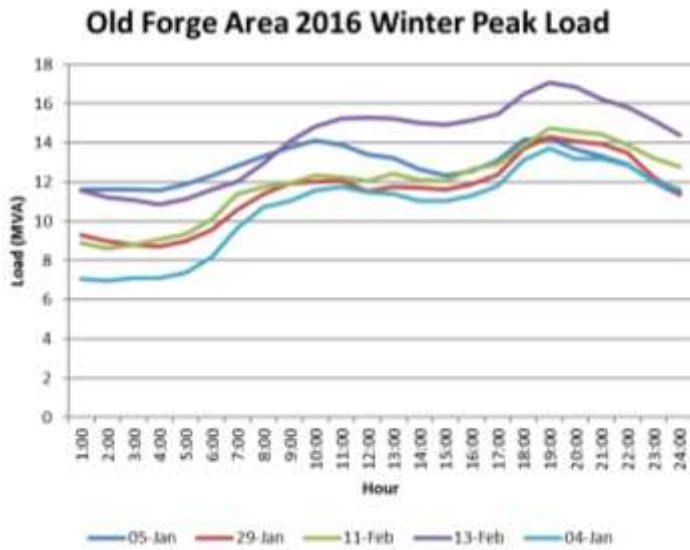


The Old Forge Area is fed by 5 substations through 10 feeders that then provide electricity to customers in 16 different zip codes. The following table presents the number of customers per feeder and zip code. The bold numbers indicate the substation number and customers served by it.

Substation Feeder	Zip Code																Grand Total
	12847	13301	13304	13309	13324	13331	13338	13360	13420	13431	13433	13436	13438	13472	13486	13494	
382						764		764	344	1		2					1875
71						38		764	52			2					856
72						726			292	1							1019
383			1					2	2128					390			2521
61			1						208					389			598
62								1	715								716
63									370								370
64								1	835					1			837
398	16							1	2			470		1			490
61	16							1	2			470		1			490
399								372			1					565	938
63								372			1					565	938
701		13		25	1		886						411		1	4	1688
		5		0													
52		45		24	1		687						44		1	3	1024
				3													
61		90		7			199						367			1	664
Grand Total	16	13	1	25	1	764	1258	767	2474	1	1	472	411	391	1	569	7512
		5		0													

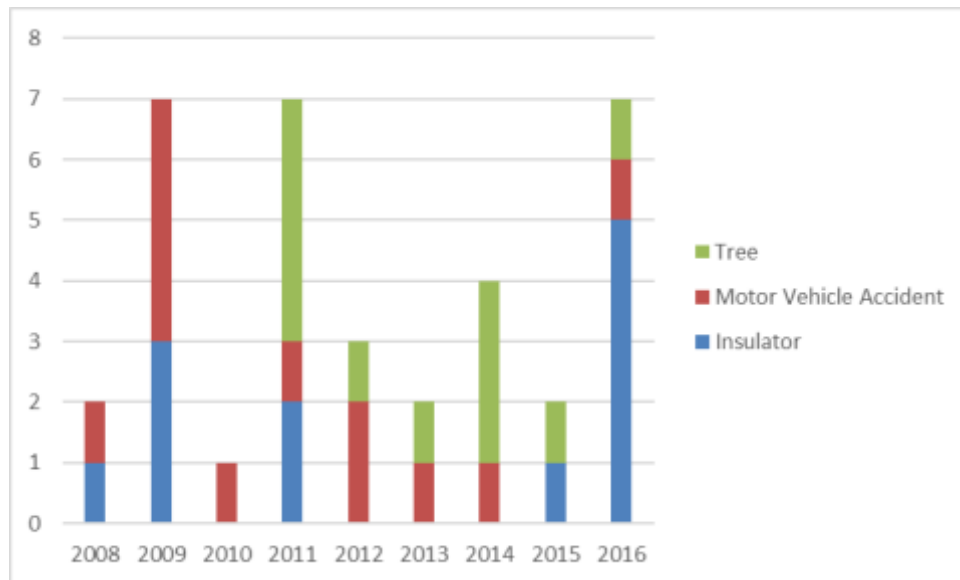
The following graphs depict daily load curves in the summer 2015 for the entire Old Forge Area as some substations don't have data collection. On summer peak days, the load varies from 15-20MVA; on light days, the load varies from 6-9MVA. During winter 2016 the load rose throughout the day, peaking at 7-8PM.





CURRENT CHALLENGES

The sub-transmission line (46kV) from Alder Creek to Raquette Lake substations has experienced a number of faults resulting in outages. The system is interrupted for any single contingency as it is of radial configuration with N-0 criteria. Due to the proximity to the Adirondack State Park portion of State Route 28, motor vehicle accidents as well as tree trimming and clearing are a problem. The figure below shows the number and root cause of outages from 2008 to 2016.



According to National Grid's **Annual Electric Reliability Report** for 2015, 6 of the 15 worst performing circuits are situated in the Old Forge Area:

	Total Interruptions	# Customers Interrupted	Customer Hour Interruptions
Eagle Bay 38272	27	5,769	16,224
Old Forge 38362	22	4,413	12,780
Eagle Bay 38271	18	5,990	12,621
Old Forge 38361	16	3,436	11,415
Raquette Lake 39861	12	3,529	11,980
Old Forge 38364	11	4,303	11,481

The entire sub-transmission line is supplied from a single 115 – 46 kV transformer at Boonville which, according to National Grid's Distribution Planning, was loaded to 56% of its summer normal rating in 2015. That same year, Alder Creek 46 – 4.8 kV transformer was loaded to approximately 89%, while Raquette Lake 46 – 4.8 kV transformer to approximately 78% of its summer normal rating. These two transformers are forecasted to exceed their normal loading by 2030. Normal loading on the other substations is currently within normal equipment ratings and is not forecasted to be overloaded until beyond 2030. The load growth by transformer is based on National Grid's total load growth projections of 21.5% over the period of 2016 to 2030 (see table below with year-over-year growth rates)

Transformer	Normal Capacity (MVA)	Actual Summer 2015 (MVA)	Forecasted Peak 2017 (MVA)	Forecasted Peak 2030 (MVA)
Boonville #3 115 – 46 kV	34.6	19.4	21.7	25.5
Alder Creek 46 – 13.2 kV	5.45	4.1	4.5	5.4
Alder Creek 46 – 4.8 kV	1.58	1.4	1.53	1.8
Eagle Bay 46 – 4.8 kV	3.99	2.7	3.0	3.5
Old Forge #1 46 – 4.8 kV	4.52	2.3	2.5	3.0
Old Forge #2 46 – 4.8 kV	5.25	2.7	3.0	3.5
Raquette Lake 46 – 4.8 kV	1.16	0.9	1.0	1.2
White Lake 46 – 4.8 kV	1.58	1.1	1.2	1.4

Year	2016	2016 Weather Normalized	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Growth (%)	2.3	10.5	1.2	0.8	0.5	0.1	1.1	1.1	1.3	1.5	1.5	1.6	1.6	1.6	1.7	1.7

The following feeder data by substation is taken from the [National Grid System Data Portal](#) that is current as of June 2016. Individual feeder hosting capacities together with any additional clarifying or supporting information will be made available to potential respondents after the NWA RFP is released. Although models are often better at providing insight rather than answers, individual feeder loading and reliability along with other NWA information can be derived from the following table.

	Sub-Feeder	Voltage Level (kV)	Summer Rating		2015 Peak		2016 Peak		2016 Outage (MWh)	DG Connected (kW)	DG Queued / Applications (kW)
			MVA	Amp	MVA	Amp	MVA	Amp			
Eagle Bay (382)	38271	4.8	2.08	250	1.22	147	1.34	161	0.9	0	0
	38272	4.8	2.08	250	1.44	173	1.57	189	1.5	9	15.3
Old Forge (383)	38361	4.8	2.08	250	0.83	100	0.91	109	0.6	0	0
	38362	4.8	2.08	250	1.00	120	1.09	131	0.7	7.2	0
	38363	4.8	2.08	250	1.08	130	1.18	142	0.8	0	0
	38364	4.8	2.08	250	1.20	144	1.31	158	0.9	22.8	0
Raquette Lake (398)	39861	4.8	2.08	250	0.91	110	1.00	120	3.7	0	10
White Lake (399)	39963	4.8	2.08	250	1.11	134	1.22	147	4.5	0	0
Alder Creek (701)	70152	13.2	6.86	300	3.84	168	4.21	184	15.4	20.8	3356
	70161	4.8	2.08	250	1.21	145	1.32	159	0.9	6	460

WAYS TO REMEDY CHALLENGES

In order to increase the reliability of the line, the utility would traditionally: (1) build a new line, (2) relocate the existing poles and expand the vegetation management program, (3) move sections of the line underground and (4) add additional reclosers to further isolate the fault.

A traditional utility solution to reduce peak load on a substation, improve reliability and provide contingency in case of transformer failure, would be to: (1) install a new transformer, (2) expand the station bus with additional breaker positions, and (3) build additional feeder ties. The additional feeder positions and distribution feeder reconfigurations would increase local capacity for new connections, reduce system losses, and reduce adverse impact of a fault on the distribution system.

To address the specific system deficiencies in the Old Forge Area, National Grid is soliciting possible NWA solutions to achieve one or more of the following:

1. defer the need for a traditional solution;
2. reduce the scale of a traditional solution; or
3. augment the benefits of a traditional solution

The preferred approach is to postpone the required investment in distribution and/or transmission equipment with NWA solution #1—defer the need for a traditional solution.

NWA solutions proposed by vendors will be evaluated against the benefits of traditional T&D equipment (listed above). It is preferred that the NWA solution be in place for the 2017 performance year; however, it is understood that such a target

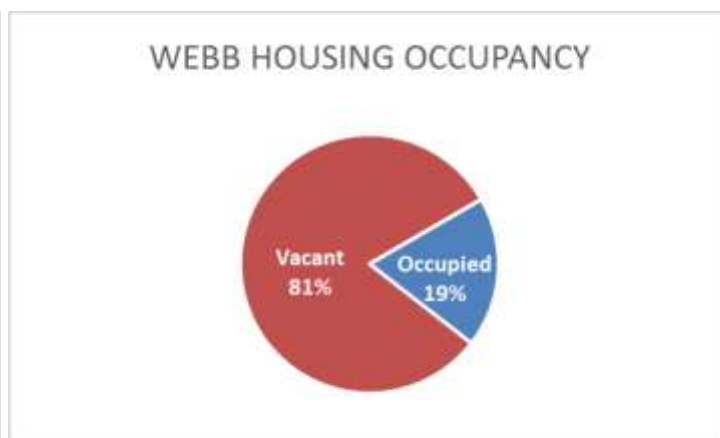
may not be possible for certain DERs. A conceptual engineering estimate for implementing a traditional wires solution has not yet been completed as this project is not yet identified in National Grid’s Capital Investment Plan filed with the Commission. An early estimate for implementing a traditional wires solution for the Old Forge Area is approximately \$16M.

Several factors determine the ability and cost of implementing NWA to the Old Forge electric system. Actual system needs will depend on weather conditions, unavailability of other resources and coincidence factors amongst others. For an accurate assessment, actual interconnection requirements and costs must be defined by considering the specific project location, operating characteristics and timing.

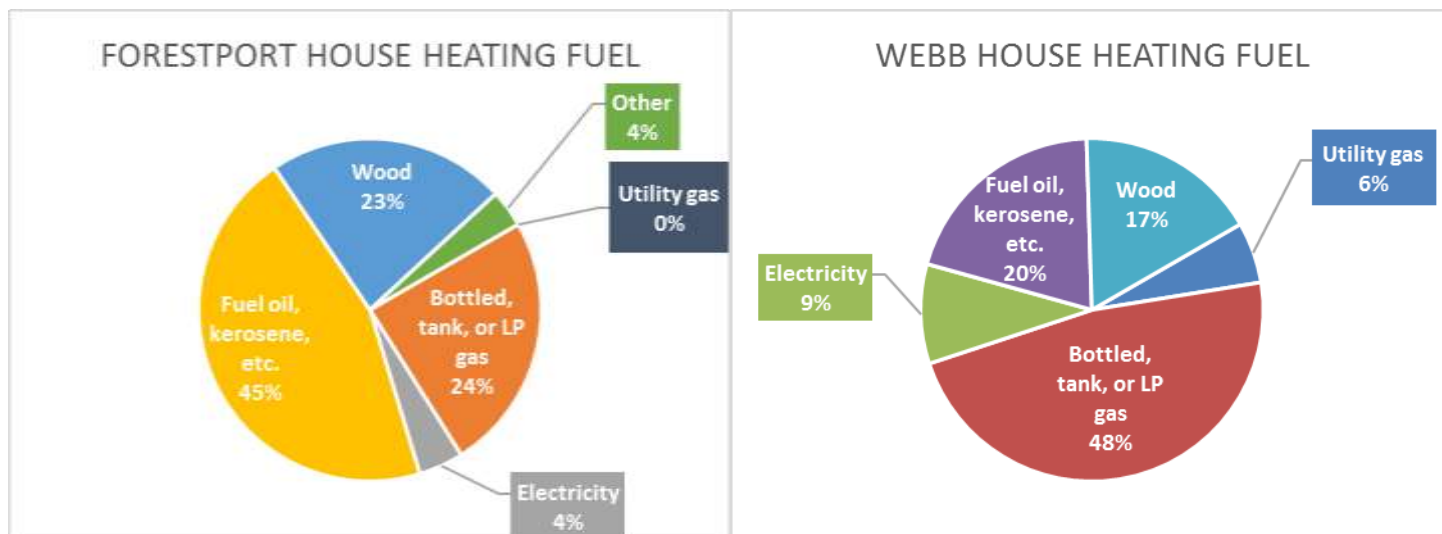
NOTE: Subject to changes in forecasted needs, solution pricing, as well as any other applicable costs and benefits, National Grid is targeting to procure demand response and/or generation/storage that could supply the substation(s) load in its entirety or a large portion of it. During normal operation, any excess power could be exported to the National Grid System. Depending on such factors as economics, portfolio fit, quantity of offers received, and potentially other qualitative factors, National Grid could conceivably utilize several different NWA solutions.

KEY CUSTOMER PROFILES

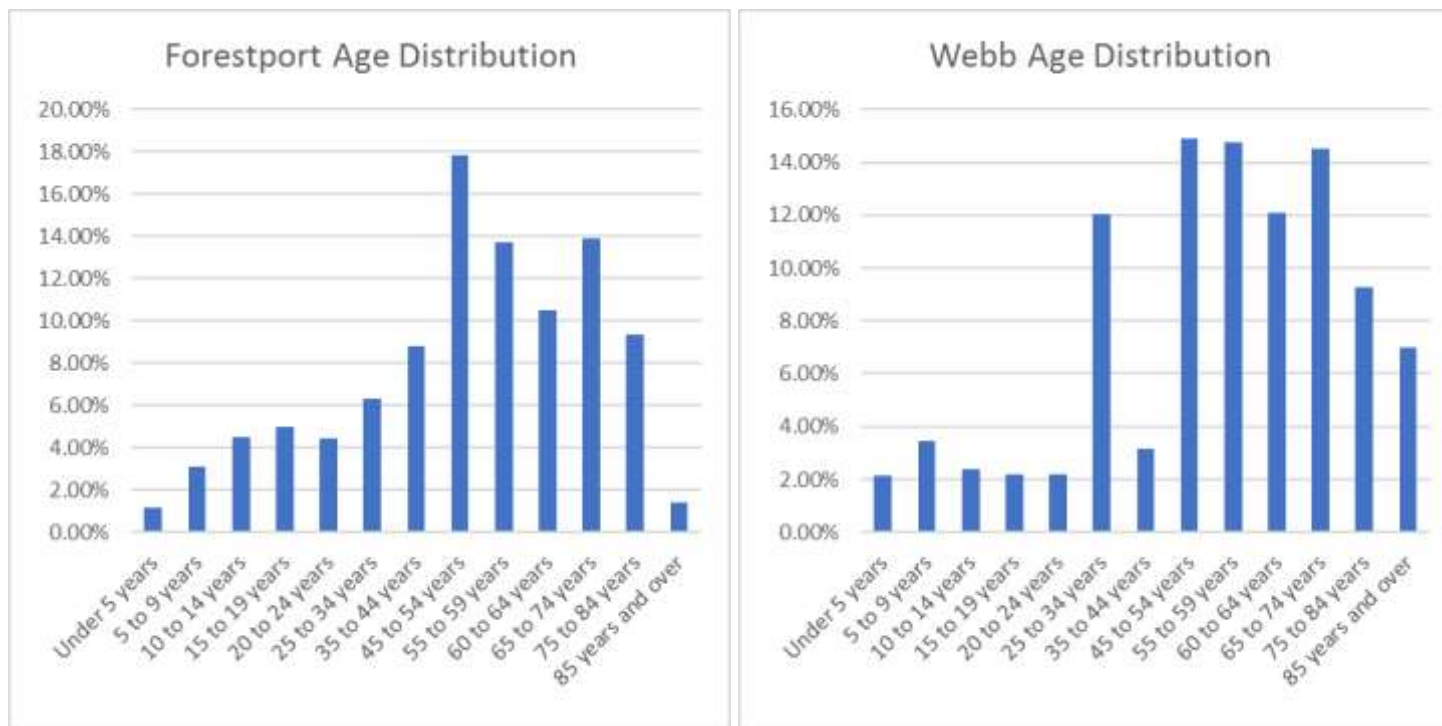
According to the 2015 American Community Survey there are 6,289 housing units in townships of Forestport and Webb, which are almost entirely served by substations discussed in this report. The substations’ feeders also supply power to small parts of other zip code areas that are not included. In general, the Old Forge Area, is very sparsely populated with many homes categorized as “vacant.” These “vacant” residences might be used seasonally as vacation homes or camping grounds.



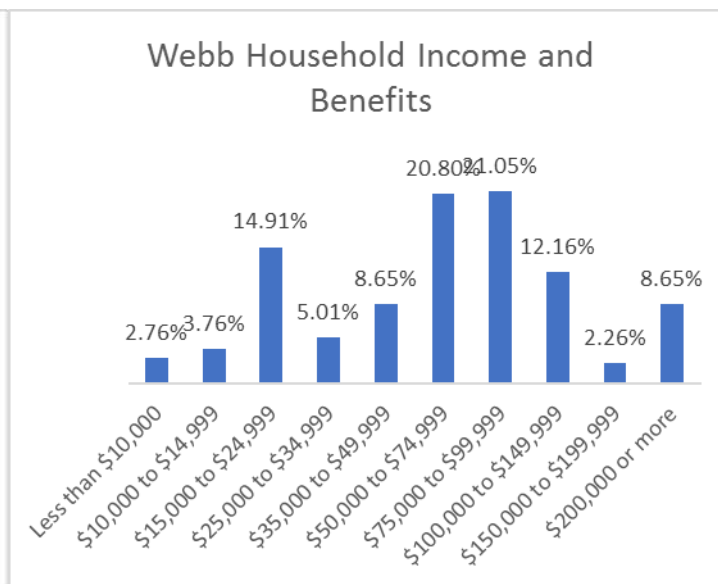
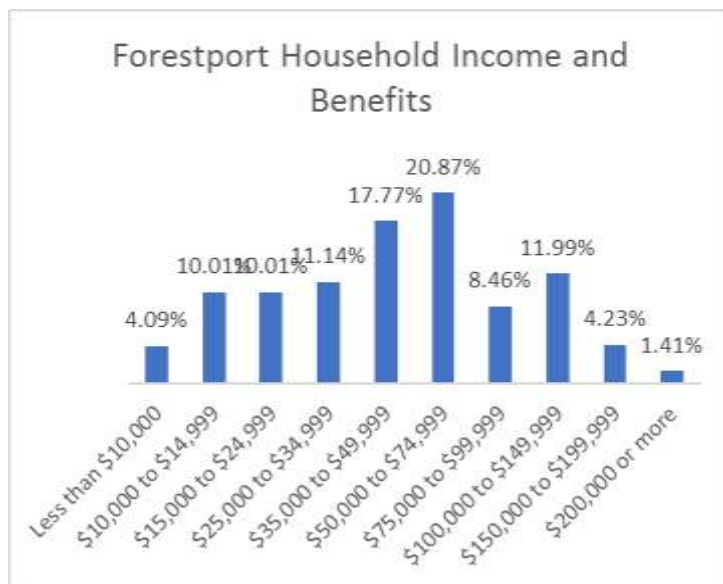
Most (~89%) of the units are single-family, with the balance being mobile homes and few multi-family. Half of the structures were built after 1970. Most households do not use natural gas or electricity as their primary heating fuel (see below); nevertheless, they have an impact on electric system loads during severe heating-degree days due to the use of space heaters



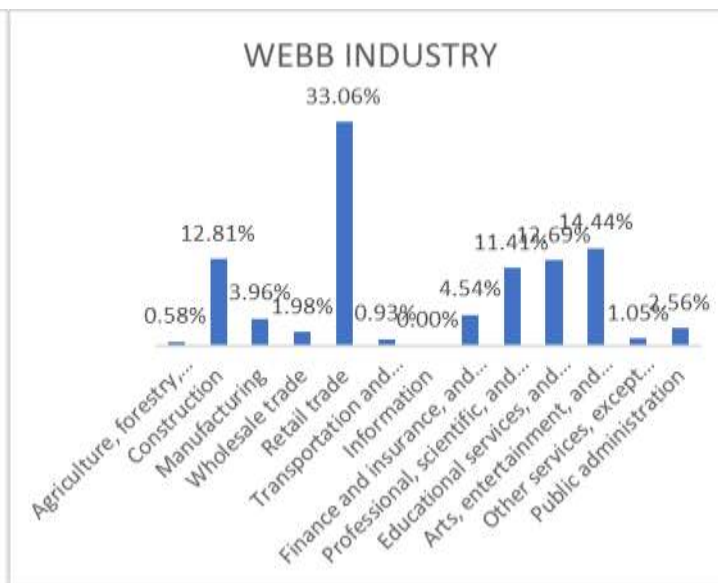
There are 1,509 and 1,647 residents in the towns of Forestport and Webb with a median age of 54.4 and 56.8 respectively.



The median income in Forestport is \$47,663, while the mean is \$53,678 (2014 inflation-adjusted). In Webb, it is \$64,000 and \$82,013 respectively.



Ninety percent of persons age 25 years+ in Forestport are high school graduates while 19.2% have a Bachelor's degree or higher. In Webb, those numbers climb to 95% and 35%, respectively. As depicted below, most of the workforce is in the construction, retail trade and arts industries, which is consistent with the large proportion of season residences discussed above.



The following tables were derived from National Grid’s Customer Load Data, which generally covers the 2016 calendar year (exceptions include shorter time periods and/or later start/end date). Highly accurate data can be very difficult and costly to produce; hence, the following should be used for information purposes only. “Max” values represent the peak of the largest single customer while “Avg” values represent the average mean value of all customers on the associated feeder.

		kW ANALYSIS – RESIDENTIAL CUSTOMERS						
	Sub-Feeder	Customers	Max kW	Avg kW	Max kW (summer)	Avg kW (summer)	Max kW (winter)	Avg kW (winter)
Eagle Bay	38271	749	7.70	0.49	7.70	0.90	7.23	0.62
	38272	961	7.56	0.40	7.56	0.86	5.54	0.43
Old Forge	38361	535	5.95	0.46	5.95	0.84	4.13	0.56
	38362	691	9.41	0.57	9.41	1.12	6.45	0.68
	38363	283	12.87	0.67	12.87	1.23	3.89	0.80
	38364	761	14.06	0.44	8.21	0.80	14.06	0.57
Raquette Lake	39861	418	8.03	0.30	8.03	0.76	3.01	0.24
White Lake	39963	882	6.39	0.41	3.98	0.76	6.39	0.53
Alder Creek	70152	956	16.39	0.71	16.39	1.17	7.39	0.98
	70161	618	8.54	0.77	8.37	1.24	8.54	1.11

- There is no peak kW data available for residential customers and the values given are approximated
- Peak kW among residential users vary drastically (as demonstrated by differences between maximum and average yearly values), which might be due to vacation homes that are not used throughout the year or homes that use electricity for heating

		kW ANALYSIS – COMMERCIAL CUSTOMERS						
	Sub-Feeder	Customers	Max kW	Avg kW	Max kW (summer)	Avg kW (summer)	Max kW (winter)	Avg kW (winter)
Eagle Bay	38271	116	61	5	61	5	51	4
	38272	65	68	7	68	7	49	4
Old Forge	38361	66	109	8	53	7	109	5
	38362	31	789	37	54	7	789	36
	38363	90	194	10	182	11	163	9
	38364	83	91	13	78	10	91	10
Raquette Lake	39861	73	124	9	94	8	124	5
White Lake	39963	64	88	6	88	5	48	3
Alder Creek	70152	75	93	6	93	5	82	5
	70161	50	59	5	59	4	54	3

- Peaks among commercial users tend to be very high for most users, and extremely high for a few users (as demonstrated by differences between maximum and average yearly values). This is particularly applicable during the winter season.
- Feeder 38362 has unusually high winter loads

Several customer characteristics can be inferred by comparing summer and winter consumption, Max and Avg values both on individual feeders and related to others.

		kWh ANALYSIS - RESIDENTIAL CUSTOMERS										
	Sub-Feeder	Total kWh	Max kWh	Avg kWh	Total kWh (summer)	% Yearly Total	Max kWh (summer)	Avg kWh (summer)	Total kWh (winter)	% Yearly Total	Max kWh (winter)	Avg kWh (winter)
Eagle Bay	38271	3,154,098	35,102	4,257	1,444,857	46%	16,872	1,966	971,428	31%	15,826	1,357
	38272	3,320,791	29,367	3,477	1,773,956	53%	16,553	1,875	864,737	26%	12,138	948
Old Forge	38361	2,145,112	28,902	4,032	969,038	45%	13,026	1,832	608,603	28%	9,044	1,217
	38362	3,414,695	34,635	4,985	1,663,719	49%	20,615	2,461	983,463	29%	14,127	1,499
	38363	1,633,878	45,022	5,835	738,771	45%	28,186	2,696	456,749	28%	8,526	1,750
	38364	2,875,909	67,814	3,814	1,299,739	45%	17,977	1,749	885,989	31%	30,786	1,246
Raquette Lake	39861	1,107,353	25,565	2,656	688,876	62%	17,593	1,660	207,815	19%	6,583	523
White Lake	39963	3,154,477	28,380	3,605	1,428,387	45%	8,710	1,657	968,843	31%	13,996	1,151
Alder Creek	70152	5,869,460	62,649	6,185	2,375,568	40%	35,898	2,557	2,000,416	34%	16,187	2,137
	70161	4,140,739	42,936	6,744	1,639,737	40%	18,333	2,710	1,477,122	36%	18,705	2,422

- Raquette Lake customers are highly seasonal with majority of energy being consumed during the summer months)
- Alder Creek customers have the highest consumption in Old Forge Area

		kWh ANALYSIS - COMMERCIAL CUSTOMERS										
	Sub-Feeder	Total kWh	Max kWh	Avg kWh	Total kWh (summer)	% Yearly Total	Max kWh (summer)	Avg kWh (summer)	Total kWh (winter)	% Yearly Total	Max kWh (winter)	Avg kWh (winter)
Eagle Bay	38271	1,785,235	192,369	15,524	958,850	54%	105,880	8,338	441,598	25%	42,646	3,943
	38272	1,074,201	163,000	16,784	644,033	60%	91,640	10,388	232,626	22%	32,937	3,752
Old Forge	38361	1,364,188	182,720	20,670	697,899	51%	85,440	10,737	347,905	26%	68,960	5,522
	38362	1,025,958	N/A	33,095	310,169	30%	N/A	10,005	440,932	43%	N/A	14,698
	38363	3,009,424	N/A	33,438	1,530,592	51%	N/A	18,221	750,550	25%	N/A	9,266
	38364	2,017,987	220,640	24,610	957,824	47%	81,360	11,681	620,726	31%	85,520	7,759
Raquette Lake	39861	1,149,010	N/A	15,740	678,799	59%	80,960	9,299	270,433	24%	N/A	3,809
White Lake	39963	656,596	70,729	10,422	369,733	56%	40,800	5,963	144,751	22%	16,989	2,373
Alder Creek	70152	1,181,382	188,160	15,965	514,238	44%	88,560	6,949	393,642	33%	62,240	5,467
	70161	677,302	N/A	13,546	309,801	46%	N/A	6,196	203,718	30%	N/A	4,158

- Customers on several feeders do not satisfy the 15/15 customer privacy rule, therefore some values have been omitted
- White Lake Commercial customers are the smallest in Old Forge Area

POTENTIAL SOLUTIONS

As noted, National Grid is interested in exploring the viability and impact of a range of NWA solutions. While there might be a single solution that could address the cumulative need of the Old Forge area, it is more likely that a portfolio of NWA solutions would meet the need and produce multiple local benefits. As an alternative, National Grid might leverage its existing programs and experience to lower the amount of DER that needs to be procured through a NWA solution provider; or otherwise influence the technical and financial viability of supplementary NWA solutions.

Currently National Grid is implementing three Dynamic Load Management (DLM) Programs: Distribution Load Relief Program (“DLRP”), Commercial System Relief Program (“CSR”) and Direct Load Control (DLC) Programs. DLRP calls for load relief during distribution electrical emergencies while CSR is dispatched during summer load peaks.

Although customers in most rate classes are eligible for all three programs, National Grid considers the DLRP and CSR to be “commercial” customer-focused programs, and the DLC program to be a residential and small business customer-focused program.

For the 2015 summer capability period, all three programs were applied specifically to an area of electrical stress located in Kenmore, New York, a suburb of Buffalo. In 2016, the CSR and DLC “Bring Your Own Thermostat” programs were expanded system-wide in Niagara Mohawk territory. The DLRP program and DLC “Company Provided Thermostat” program remained focused in designated areas only as of this writing.

In Kenmore, there is a very small pool of DLRP eligible, interval-metered large commercial customers capable of curtailing 50 kW or more. Hence, National Grid did not sign up new participants in 2016. On the other hand, CSR program enrollments far exceeded expectations for the abbreviated 2016 program year. The program had 144 customers, represented by 3 aggregators, and together committing to 140 MW of load curtailment.

When an area is expected to reach 92% of its highest peak load forecast, DLC and CSR is initiated; this triggers CSR customers load relief, ThinkEco Modlet systems, participating thermostats, as well as washers and dryers, ductless splits, and WiFi controllable window air conditioners. By turning off or modifying the operation of these devices National Grid is able to lower demand during peak times and ensure the reliability of community’s electric grid. Customers participating in the CSR program reduce load themselves.

About 5% of residential and small business customers in North Buffalo, Kenmore, and Tonawanda, NY are enrolled in the “coolControl Program” where DLC Company Provided Thermostats facilitate a curtailment capacity of approximately 484kW. “ConnectedSolutions” is a newly established DLC Bring Your Own Thermostat program in Niagara Mohawk territory that is available to Central AC customers with Honeywell or EcoBEE thermostats; to date, 207 enrolled customers produce a total curtailment of 190 kW.

National Grid-targeted NWA solutions are required to be greater than the requested peak demand reduction to accommodate coincidence factors and unavailability of programs. These potential NWA solutions include: Distributed Generation, Demand Response, Energy Efficiency, Energy Storage and other resources that can meet the identified reliability need.

To achieve timely reductions, National Grid will evaluate potential NWA solutions based on:

- Customer availability and intent
- Timeliness
- Efficiency of resources
- Reliability of load reduction
- Flexibility of resources
- Availability of resources
- Commercially proven technology

The following table provides an indicative list of NWA solutions rated against key attributes. It should be noted that the ratings represent basic technical capability rather than actual current applications.

Technology	Type	Cost	Scalability	Generating Capacity	Distribution Capacity	Voltage Regulation	Frequency Regulation	Load Following	Balancing	Spinning Reserve	Non-Spinning Reserve	Black Start
Combined Heat and Power	Generator	\$\$\$\$	○	●	●	●	●	●	●	●	●	●
Run of River Hydro	Generator	\$\$\$\$	○	●	●	●	●	●	●	●	●	●
Distributed Solar	Generator	\$\$\$\$	◐	◐	◐	○	○	○	○	○	○	○
Distributed Solar with an Advanced Inverter	Generator	\$\$\$\$	◐	◐	◐	●	●	◐	○	○	○	○
Energy Storage	Storage	\$\$\$\$	◐	◐	●	●	●	●	●	●	●	●
Thermal Storage	Storage	\$\$\$\$	◐	◐	◐	○	○	◐	●	○	○	○
Interruptible Load	Load Shaping	\$\$\$\$	◐	○	○	○	○	○	●	●	●	○
Direct Load Control	Load Shaping	\$\$\$\$	◐	◐	○	○	○	○	●	●	●	○
Behavioral Load Shaping	Load Shaping	\$\$\$\$	◐	◐	◐	○	○	◐	◐	○	○	○
Energy Efficiency	Load Reduction	\$\$\$\$	◐	◐	◐	○	○	○	○	○	○	○

Legend

- Unsuitable to perform the specific service
- ◐ May be able to provide some support
- ◑ Able to provide partial support
- Able to perform a service
- Well suited to perform the specific service

BUSINESS CASE CRITERIA

The Benefit Cost Analysis Handbook which was filed with Initial Distributed System Implementation Plan (DSIP) on June 30, 2016 outlines three distinct tests which help evaluate each potential deployment approach from a variety of standpoints.

Test	Key Question Answered	Calculation Approach
Societal Cost Test	Is there a net reduction in societal costs?	Compares the costs incurred to design and deliver projects, and customer costs with avoided electricity and other supply-side resource costs (e.g., generation, transmission, and natural gas); also includes the cost of externalities (e.g., carbon emissions and other net non-energy benefits)
Utility Cost Test	Is there a net change in utility system costs and what is the impact of the proposed solution on average customer bills?	Compares the costs incurred to design, deliver, and manage projects by the utility with avoided electricity supply-side resource costs
Rate Impact Measure	How will utility rates be affected?	Compares utility costs and utility bill reductions with avoided electricity and other supply-side resource costs

Each test attempts to address the complexities involved in large scale investments with a unique understanding of how utility expense translates into tangible savings and improvement for all impacted parties. Even though the benefit and cost calculations for the three tests have many overlaps the SCT is considered as the primary cost-effectiveness measure.

The BCA handbook further outlines common input assumptions and sources that are applicable statewide and utility-specific inputs that may be commonly applicable to a variety of project-specific studies. For example, it is stated that the after-tax utility weighted average cost of capital should be used as the discount rate across all metrics.