

October 30, 2020

VIA ELECTRONIC DELIVERY

Honorable Michelle L. Phillips
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)

NIAGARA MOHAWK POWER CORPORATION d/b/a NATIONAL GRID: DISTRIBUTED GENERATION INTERCONNECTION REV DEMONSTRATION PROJECT – Q3 2020 REPORT

Dear Secretary Phillips:

Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid”) hereby submits for filing in the subject proceeding the Q3 2020 Report for the Distributed Generation Interconnection REV Demonstration Project covering the period of July 1, 2020 to September 30, 2020.

Please direct any questions regarding this filing to:

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Hon. Michelle L. Phillips, Secretary
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Thank you.

Respectfully submitted,

/s/ Janet M. Audunson

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**Distributed Generation Interconnection
REV Demonstration Project
Case 14-M-0101**

Quarterly Report – Q3 2020

October 30, 2020

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1.0 Executive Summary

On October 19, 2018, Niagara Mohawk Power Corporation d/b/a National Grid (“National Grid” or the “Company”) filed a Revised Implementation Plan (the “Revised Implementation Plan”) for the Distributed Generation Interconnection REV Demonstration Project (the “Project”) in Case 14-M-0101.¹ The Company designed the initial phase of the Project to test alternative solutions for increasing the pace and scale of interconnecting distributed generation (“DG”) systems above 50 kW through upfront investments in common upgrades at two substations (Peterboro and East Golah) coupled with a cost-allocation methodology aimed at removing barriers for DG interconnection applicants. The Company subsequently expanded the Project’s scope to test: 1) whether the cost-allocation approach can be used to facilitate DG development in targeted areas, such as landfills and brownfields; 2) strategies for proactively and constructively engaging communities and municipalities in the DG development process; 3) whether replacing coupling capacitor voltage transformer (“CCVT”) equipment with optical voltage transformer (“VT”) equipment in a 115-13.2 kV substation will reduce the time to install zero-sequence overvoltage (“3V₀”) protection equipment; and 4) the potential for switched-source technology to increase hosting capacity through active power flow control (*i.e.*, diverting power production to adjacent feeders).

The expanded approach enables the Company to build on the Project’s early successes without losing momentum. Additionally, the items tested in the Revised Implementation Plan will further help the Company refine its approach for scaling the DG interconnection cost-allocation model in a manner best suited to facilitate the efficient development of DG across the State. The purpose of this quarterly report is to provide an update on Project status and any changes to the Project.

2.0 Highlights Since Previous Quarter

2.1 Initial Phase of the Project

National Grid completed construction of common upgrades at the Peterboro and East Golah substations in late 2017, ahead of schedule. The work included the installation of 3V₀ protection² and load tap changer (“LTC”) controller upgrades to two transformers at each substation. During the design and construction phases, the Company marketed the increased hosting capacity and the Project’s cost-allocation mechanism to DG developers. With these efforts, the Company was able to secure a sufficient level of DG interconnection applications for each substation to fully subscribe the available hosting capacity.

¹ Case 14-M-0101, *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision* (“REV Proceeding”), Niagara Mohawk Power Corporation d/b/a National Grid Distributed Generation Interconnection REV Demonstration Project – Revised Implementation Plan (filed October 19, 2018) (“Revised Implementation Plan”).

² 3V₀ protection is required where delta primary-wye grounded secondary power transformers can experience backfeed under light load conditions from sources on the electric distribution system (*e.g.*, DG projects).

2.1.2 Queue Status

Below is the queue status for the Peterboro and East Golah substations.

Peterboro					
CASE#	Status	Step	Sub-Step	Queue Date	Size (kW)
102114	Connected	Final Approval Sent	Reconciliation Complete	6/22/2016	1400
170433	Construction	In Progress	Design and Engineering (100%)	2/27/2018	1980
170444	Construction	In Progress	Design and Engineering (100%)	2/21/2018	3000
172193	Construction	Not Started	N/A	3/26/2018	5000
173939	Construction	In Progress	Design and Engineering (100%)	4/19/2018	5000
173942	Construction	In Progress	Design and Engineering (100%)	4/19/2018	5000
190582	Construction	Not Started	N/A	7/27/2018	2900
199116	Construction	In Progress	Design and Engineering (100%)	10/29/2018	3250
291355	Study	In Progress	Internal Study	6/2/2020	5000
297264	Pending Withdrawal	N/A	N/A	6/29/2020	5000
316828	Preliminary Study	Preliminary Results Meeting	Occurred	10/19/2020	5000

East Golah					
CASE#	Status	Step	Sub-Step	Queue Date	Size (kW)
102158	Connected	Final Approval Sent	N/A	3/8/2016	2000
171687	Construction	In Progress	Design and Engineering (100%)	3/23/2018	5000
171666	Construction	In Progress	Design and Engineering (100%)	3/13/2018	4000
171238	Construction	Not Started	N/A	4/5/2018	5000
171907	Construction	In Progress	Design and Engineering (100%)	3/23/2018	3000
187820	Construction	In Progress	Design and Engineering (100%)	7/5/2018	5000
191001	Connected	Final Approval Sent	N/A	8/3/2018	350
229610	Construction	Not Started	N/A	6/18/2019	1450

2.1.3 Cost Recovery

The Company's actual spending on the initial phase of the Project was \$1,327,807 slightly below the initial estimated budget of \$1,581,351.

The common substation upgrades are complete. To date, the Company has recovered \$1,896,954 from DG applicants who initiated the interconnection process at the initial substations. All

additional payments received in excess of the total Project spend from developers will be refunded as part of the Project reconciliation process.

2.2 Second Phase of the Project

2.2.1 Major Task Activities

National Grid filed the Revised Implementation Plan in October 2018. In the second phase of the Project, the Company is testing the common-upgrade cost-allocation concept by expanding the Project to areas with municipal landfills and brownfield sites that have high DG (or DG coupled with energy storage) development potential. The sites have drawn interest from municipal officials and the DG developer community. Likewise, the New York State Energy Research and Development Authority (“NYSERDA”) has redesigned the NY-Sun MW Block Program to include a new \$0.10/kW incentive adder for solar projects on landfill/brownfield sites, enhancing the economics of developing DG projects in these areas. Furthermore, developing DG projects on these sites may offer multiple benefits to municipalities by reducing energy costs, meeting local sustainability commitments, and providing an additional stream of revenue via lease payments, all while preserving farmland. Also, the proactive outreach to communities and municipalities in these targeted areas will accelerate the pace of DG development by addressing local concerns and permitting delays.

Prospect Hill substation has failed to garner significant developer interest and therefore, Berry Road substation, which has several projects already in the interconnection queue, replaced Prospect Hill substation for the second phase of the Project. The Prospect Hill component of the Project installed a VT. The Company’s evaluation showed no construction time savings in installing the optical VT versus the CCVT.

Below is the Project milestone schedule included in the Revised Implementation Plan, updated to include changes, adjustments, and the status of each milestone.

General Project Milestones	Start Date	Finish Date	Status
Milestone			
Provide funding numbers	11/1/2018	11/15/2018	Completed
Finalize engineering analysis of landfill sites	11/1/2019	11/15/2018	Completed
Substation design	11/15/2018	4/30/2019	Completed
General Project Milestones	Start Date	Finish Date	Status
Outreach to municipalities and industry (4 sites)	1/1/2019		On-going
Order long-lead materials	12/1/2018	12/19/2018	Completed
Begin marketing existing "DG ready sites" - 26 sites	1/1/2019	3/31/2020	Completed
Outreach to eleven landfill counties along with NYSERDA	1/1/2019	12/31/2019	Completed
Outreach to fifteen landfill counties along with NYSERDA	1/1/2019	3/31/2020	Completed
Substation Milestones for Cedar, Indian River and Butler			
Milestone	Start Date	Finish Date	Status
3V ₀ design and engineering	11/15/2018	4/30/2019	Completed
Civil work	7/1/2019	7/31/2019	Completed
Electrical work	8/1/2019	9/30/2019	Completed
Relay work	10/1/2019	11/30/2019	Completed
In-Service Date		12/31/2019	Completed

Substation Milestones for Berry Road			
Milestone	Start Date	Finish Date	Status
3V ₀ design and engineering	5/9/2019	12/5/2019	Completed
Civil work	5/4/2020	5/22/2020	Completed
Electrical work	5/26/2020	6/30/2020	Completed
Relay work	7/1/2020	7/24/2020	Completed
In-Service Date		7/31/2020	Completed

2.2.2 Municipal / Community Engagement

National Grid’s “Going Solar for Municipalities” event was successful with the Company seeing an increase in the number of DG applications following the October 3, 2019 event. Only one substation, Prospect Hill, has failed to garner significant developer interest, and therefore Berry Road substation, which has several projects already in queue, replaced Prospect Hill for the second phase of the Project. The Company also continues to work with the New York Solar Energy Industry Association on further marketing efforts.

2.2.3 Scaling Common Upgrade Cost Allocation Model

The Company worked with NYSERDA to identify four substations where common upgrades were required before DG projects (or DG coupled with energy storage) would be capable of interconnecting from nearby landfill/brownfield sites. As with the initial phase of the Project (*i.e.*, Peterboro and East Golah substations), National Grid proposed to upgrade the distribution system at four substations, making them ready for future DG applicants to interconnect.³ The investment includes the installation of 3V₀ protection and LTC controller upgrades for the transformer banks below:

Substation	Added Hosting Capacity	Area Landfill/Brownfield* Sites Served	Construction Status
Cedar	17 MW	Fort Ann, Queensbury, Evans Mills, and Moreau in Washington, Warren, Jefferson, and Saratoga counties, respectively	Complete
Indian River	20 MW		
Butler	17 MW		
Berry Road	24 MW	Chautauqua County	Complete
*Note: Berry Road is not an Area Landfill/ Brownfield Site			

The Company has already constructed the upgrades at Cedar, Indian River, and Butler substations, and has completed the reconciliations this quarter. Berry Road substation has been added to the Project to replace Prospect Hill. The Berry Road 3V₀LTC upgrade has been constructed and is in service. The as-built documentation for Berry Road substation is currently in the process of being updated. This effort is on track to be completed by the end of December 2020 and will be followed by project reconciliation in January 2021.

2.2.4 Switch-Source Tie Controller

To further increase hosting capacity, the Company researched Switch-Source Tie Controller technology. Based on the initial analysis, required system protection, and associated costs, National Grid cancelled this portion of the Project in the second quarter of 2019. However, the Company is planning to further investigate this technology in the near future for loading relief, providing volt/VAR support, and improving reliability.

³ If this method is approved for use across the National Grid service territory, the costs of the upgrades would be reflected in the Company’s net utility plant and depreciation expense reconciliation mechanism.

2.2.5 Financial Summary

As shown in Section 4, the Company estimates total common upgrade costs associated with the second phase of the Project to be \$2,826,180 for the four substations originally identified in the Revised Implementation Plan (*i.e.*, Cedar, Indian River, Butler, Prospect Hill). The amount, which was initially funded using the Company's REV demonstration project budget, includes capital and marketing costs. The Project has been updated to replace the Prospect Hill substation with the Berry Road substation.

National Grid is recovering the initial REV demonstration investment through a one-time, pro-rated fee charged to all applicants (not just the first applicant) with DG systems above 50 kW⁴ who connect to the upgraded substation transformer banks.⁵ The fee is based on the Company's estimated common system upgrade costs (subject to true-up once actual costs are known) for each of the substations divided by a factor that represents the total substation transformer bank capacity at each location.

3.0 Next Quarter Forecast

As set forth in Section 2, the Company has recovered all substation upgrade costs for the initial phase. For the work in the Revised Implementation Plan, National Grid will continue its marketing efforts for the landfill and brownfield sites, as well as the four substations included in Phase 2.

4.0 Work Plan and Budget Review

4.1 Updated Work Plan

The Berry Road substation has replaced the Prospect Hill substation as one of the four Phase 2 projects. The Berry Road substation 3V₀ LTC upgrade was completed on June 17, 2020, ahead of schedule.

4.2 Current Budget

The current budget for the Revised Implementation Plan (Phase 2) is provided below:

Substation	Total Estimated Spend	Actual Spend	Difference
Cedar	\$ 508,000	\$ 452,691	\$ 55,309
Indian River	\$ 508,000	\$ 433,277	\$ 74,723
Butler	\$ 508,000	\$ 458,779	\$ 49,221

⁴ The threshold of above 50 kW would apply to an aggregate amount of DG service.

⁵ DG applicants would still bear full responsibility for their respective site-specific and distribution line upgrade costs. The pro-rated fee for the substation common upgrades would be due at the same time as the fees associated with the DG applicant-specific upgrades, including distribution line upgrade costs.

Prospect Hill	\$ -	\$ -	\$ -
Berry Road	\$ 508,000	\$ 216,080	\$ 291,920
Tax Liability Applied to Capital Improvement	\$ 202,980	\$ 212,224	\$ -9,244
Total Funds for Marketing the existing "DG Ready" Sites	\$ 62,400	\$ 35,000	\$ 27,400
Total Funds for Marketing the Four Sites	\$ 28,800	\$ 58,456	\$ -29,656
Total Funds to Pilot Switched-Source Technology at Butler Substation	\$ 500,000	\$ 209,432	\$ 290,568
Total	\$ 2,826,180	\$ 2,077,111	\$ 749,469
<p>Note: Berry Road is a replacement for Prospect Hill and all costs previously attributed to Prospect Hill have been removed from the Project cost. Project spending for Berry Road includes material and construction costs only as interconnection application Case # 106008 is covering the engineering costs.</p>			

5.0 Quarterly Report Template

Quarterly Report Template	
Milestones:	
Last Project Milestone:	Construction completed
Next Project Milestone:	Market available capacity at Indian River, Butler, Cedar, and Berry Road substations. Advance as-built engineering activities for Berry Road.
Tasks/Timeline:	
Completed Project Tasks Since Last Quarterly Report:	Berry Road 3V ₀ as-built drawings marked completed by the field personnel
Changes or Impacts to Schedule Since Last Quarterly Report:	N/A
Lessons Learned:	N/A
Risks:	
Identified Risks:	Protection analysis identified major system upgrade requirements for switched-source technology. Thus, the switch-source portion of the Project has been cancelled.
Risk Mitigation Plan:	N/A
Finance:	
Total Spend to Date (Initial Phase and Revised Implementation):	\$3,404,518
Forecast Spend:	\$3,423,237

Quarterly Report Template	
Queue Status Update:	
East Golah	Two projects (2.35 MW in total) are interconnected.
	Six projects (23.45 MW in total) are currently in construction.
Peterboro	One project (1.4 MW) is interconnected.
	Seven projects (26.13 MW in total) are in construction.
	One project (5 MW) is in the CESIR process.
	One project (5 MW) is in preliminary study phase.
	One project (5 MW) is pending withdrawal.
Cedar	One project (4.65 MW) is in the interconnection agreement process.
	One project (5 MW) is in the preliminary study phase.
Butler	Two projects (0.17 MW in total) are interconnected.
	Two projects (10 MW in total) are in the interconnection agreement process.
Indian River	Six projects (20 MW in total) are in the interconnection agreement process.
	One project (5 MW) is in preliminary study phase.
	One project (5 MW) is pending withdrawal.
Berry Road	One project (1.625 MW) is in construction.
	Nine projects (20 MW in total) are in the interconnection agreement process.
	Two projects (8.875 MW in total) are in the study phase.
	One project (3 MW) is pending withdrawal.

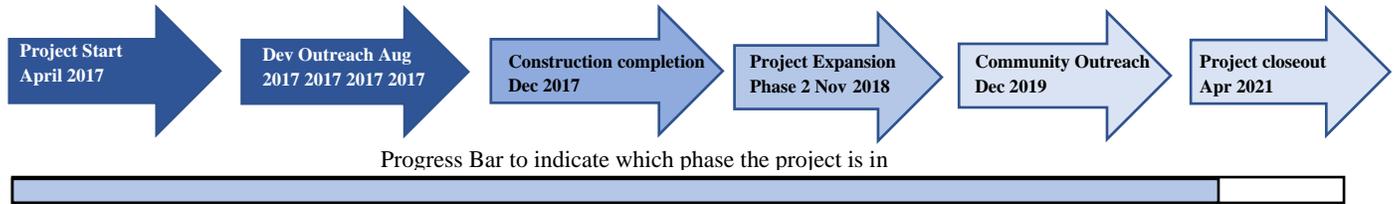
Appendix A

Distributed Generation Interconnection REV Demonstration Project One-Page Summary

Project Start Date: 4/24/2017 Project End Date: 04/30/2021 Budget: \$4,407,531

Customer Payments to Date: \$ 2,485,889 Current Quarter Spend: \$ - \$5,508 Cumulative Spend: \$ \$3,404,518

Note: Current Quarter Spend decrease primarily attributable to removing A&G and Sales Tax from the Phase I and Phase II Substation Costs.



Project Summary: In 2017, Niagara Mohawk Power Corporation d/b/a National Grid (the “Company”) proposed a cost-sharing solution for increasing the pace and scale of interconnecting distributed generation (“DG”) systems through upfront investment by the Company coupled with a cost-allocation methodology aimed at removing barriers for DG interconnection applicants. The Company installed 3V₀ technology at two substations, Peterboro and East Golah, creating 40 MW of hosting capacity. In 2018, the Company expanded the Project to upgrade four additional substations (Cedar, Indian River, Butler, and Prospect Hill) and create an additional 71 MW of hosting capacity and testing methods for further enhancing the effectiveness of the approach at increasing DG interconnections. In 2020, the Company replaced the Prospect Hill substation (17 MW of hosting capacity) with the Berry Road substation (24 MW of hosting capacity) increasing the hosting capacity created by the second phase of the Project to 78 MW.

Cumulative Lessons Learned		
The Customer	Market Partner	Utility Operations
<ul style="list-style-type: none"> • Prebuilt 3V₀ system upgrades at substations reduce interconnection lead times. • The cost-allocation methodology reduces upfront costs, enabling developers to pay a proportionate share of common upgrade costs. • Upfront engagement with municipalities is a key to reduce permitting and zoning delays for DG projects. 	<ul style="list-style-type: none"> • Developing DG projects on municipal landfills and brownfield sites may benefit municipalities by reducing energy costs, meeting local sustainability commitments, and providing an additional stream of revenue via lease payments, while protecting farmland. 	<ul style="list-style-type: none"> • Prebuilt 3V₀ system upgrades at substations located near landfills and brownfields may lead to increased DG in those areas. • The Company believes that reducing upfront costs for DG projects and accelerating the installation will help meet clean energy goals. • The potential benefits of switch-source technology are outweighed by the cost of required system protections.

Application of lessons learned: By expanding the initial successful phase of the Project to test strategies for community / municipal engagement, facilitating DG development on landfill / brownfield sites, and evaluating the potential benefits of new technologies, the Company believes it can further reduce upfront costs and accelerate DG interconnections.

Explanation for overbudget: N/A

Issues Identified: To further increase hosting capacity, the Company researched Switch-Source Tie Controller technology. Based on the initial analysis, required system protection, and associated costs, the Company cancelled this portion of the Project in the second quarter of 2019.

Solutions Identified: N/A

Recent Milestones/Targets Met: N/A

Upcoming Milestones/Targets: Continue marketing remaining capacity at Cedar, Butler, and Berry Road substations.