
Orange and Rockland Utilities, Inc.
Optimal Export REV Demonstration
Q4 2018 Report

January 31, 2019

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1.0 Executive Summary

This report covers Orange and Rockland Utilities, Inc.'s ("O&R" or the "Company") Optimal Export Reforming the Energy Vision ("REV") demonstration project ("Project") activities and costs from submission of the Project implementation plan (August 24, 2018) to the end of first full quarter (December 31, 2018).

The Project proposes to use advanced control and inverter functionality, along with supporting technologies, to optimize the export of photovoltaic ("PV") generation to the Company's distribution system. The Company will explore developer interest and acceptance of active network management solutions which may optimize PV export, and/or provide an alternative to traditional system upgrade and protection costs to interconnect. The Project commenced in June 2018 and will continue for approximately three years.

The test population is broken out into two classes: (1) Large projects, which are 0.75 MW to 5 MW in size, and (2) Mid-sized projects, which are 0.050 MW to 0.75 MW in size.

2.0 Demonstration Highlights

For Large projects, the Company has partnered with Smarter Grid Solutions, Inc. ("SGS") to test the ability to deploy advanced interconnection technology to optimize PV export, and, in some cases, to reduce interconnection costs by avoiding otherwise necessary system upgrades. In addition, O&R and SGS were approached by a PV project developer in July 2018 to discuss and explore the opportunity for alternative interconnection arrangements for a 2 MW project in O&R's service territory. Coordination among the parties continues to confirm the project would be a valid candidate to participate in the Project.

For Mid-sized projects, the Company initiated discussions with a solar developer and a third-party technology provider to identify and test a solution to reduce interconnection costs by avoiding the installation of a recloser at the point of interconnection ("POI").

2.1 Major Tasks Completed

The Project is being conducted in three phases: Phase 1 – Analysis and Engagement; Phase 2 – Deployment; and Phase 3 - Evaluation and Scaling. Efforts in this quarter have been primarily in Phase 1, with executing an agreement, and with initial engagement with developers for both demonstration pool sizes. This section highlights the Project’s milestones and activities completed.

2.1.1 Large Size Projects (0.75 MW to 5MW)

- Developed and executed the Transaction Agreement with SGS
- Developed a supplemental interconnection agreement in support of the Project
- Conducted on-site project kick-off
- Completed Vendor Risk Assessment (“VRA”)
- Identified ideal Project participants:
 - Coordinated Electric System Interconnection Review (“CESIR”) documented
 - Load model analysis configuration using the Distribution Engineering Workstation (“DEW”)
- Evaluated prospective project as it relates to O&R’s current interconnection queue
- Developed evaluation criteria and conducted initial screening, which resulted in two projects

2.1.2 Mid-Size Projects (0.050 MW to 0.75 MW)

- Engaged potential Project partners (one solar developer and one technology provider) to gauge interest in project participation
- Performed initial evaluation of a technology solution for a recloser alternative to assess Project suitability
- Received preliminary Scope of Work (“SOW”)
- Introduced the internal subject matter experts (“SMEs”) to the project goals and purpose in an effort to prepare them for a future technical evaluation
- Updated SOW with costs received from third-party developer

2.2 Activities Overview

Large size projects:

During this quarter, the Project team focused efforts on developing and executing the Transaction Agreement with SGS, along with the supplemental interconnection agreement to be signed by participating developers – *i.e.*, the Optimal Export Interconnection Agreement (“OEIA”). The OEIA will be used to secure the permission from developers so that O&R can work with SGS to understand if the PV project will be a fit for the Project. O&R and SGS also reviewed various contractual issues, including risk allocation, cyber security, and developing an agreement which allows developers to optimize PV export, while meeting all requirements within the Standardized Interconnection Requirements (“SIR”) process.

O&R conducted an initial review of the interconnection queue in its service territory. The Project team developed initial screening criteria, which includes: (a) projects which have a completed CESIR, and (b) projects whose CESIR identifies a thermal or over-voltage violation. Final criteria and screening methods will be defined as the Project progresses. Starting with a population of seven projects, initial screening has resulted in focusing on two priority projects. A more detailed analysis is underway. If results are favorable (*i.e.*, if Active Network Management (“ANM”) Element would help to solve costly upgrades required to interconnect), O&R will engage those project developers/owners.

Mid-sized projects:

The Project team plans to apply advanced inverter and supporting technologies to one to three Mid-sized projects. The Project team continued to explore multiple technologies that can apply to developer projects on a case-by-case basis, to determine if the installation of a protective recloser at the POI can be avoided. Applications will vary based on system locations and conditions, DER technology, costs for required protection, and DER capacity proposed. For Mid-sized projects, the cost of standard protection will be borne by O&R, rather than the project developer. This will allow O&R to test the business case for this new technology solution.

O&R is in initial discussions with a PV developer (who plans to deploy a 50-70 kW system) to test control equipment, as an alternate to a protective recloser. A third-party provider has introduced a potential solution to lower the cost of interconnection for smaller scale projects. The Project team has had initial discussions with O&R’s technical SMEs to review this solution. A detailed meeting between all parties is scheduled for February 2019, to review equipment specifications and verify that they meet Project requirements. If the Project goals and Company requirements are met by the proposed

solution, O&R will work with the PV developer and the third-party supplier to deploy and test the control equipment.

2.3 Next Quarter Forecast

During the next quarter, the Project team anticipates continuing to work with its Project partners and O&R SMEs toward reaching a technical solution, completing Project analysis, and identifying eligible projects. As discussed above, current efforts are focused on configuring the DEW model for improved accuracy during the technical assessment of interconnection applications. Although progress during the initial analysis has resulted in slower development times than expected (due to the complexity of the DEW model), SGS and the Project team continue to make progress toward configuring DEW model to optimize the results of the Company’s technical assessment. Once configuration of the DEW model is complete, the Project team can engage with high priority developers that are eligible to test the solution.

2.3.1 Checkpoints/Milestone Progress

Checkpoint/Milestone	Timing	Status
Develop Implementation Plan & <i>Execute vendor contract</i>	Phase 1	  
Market Engagement and Initial Interconnection Assessment	Phase 1	  
Technical Assessment of Interconnection Applications	Phase 1	  
 Complete  In Progress  Delayed		

3.0 Work Plan & Budget Review

3.1 Phase Review

The Project team has made progress on Phase 1 – Analysis and Engagement. Specifically, SGS and the Project team are focusing efforts on 1.3 – Technical Assessment of Interconnection Applications. As discussed above, the Project team has identified two projects which are potential candidates for leveraging SGS’ advanced monitoring and control technology to optimize PV export. Currently, the Project team is focused on configuring the model to maximize accuracy of the analysis.

Work plan for 2018 & 2019

ID	Task	Lead	2018												2019											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Phase 1 - Analysis and Engagement																										
1.1	Develop Implementation Plan & Execute Vendor Contract	O&R																								
1.2	Market Engagement and Initial Interconnection Assessment	O&R																								
1.3	Technical Assessment of Interconnection Applications	SGS																								
1.4	Customer Outreach for High-priority Developments	O&R																								
1.5	Detailed Technical Analysis of Priority Developments	SGS																								
1.6	Financial Analysis of Priority Developments	SGS																								
Phase 2 - Deployment																										
2.1	Execute Interconnection Agreements	O&R																								
2.2	Factory Acceptance Testing of ANM Elements	SGS																								
2.3	Site Acceptance Testing and Deployment of ANM Elements	SGS																								
2.4	Commissioning of DER Site(s)	O&R																								
Phase 3 - Evaluation and Scaling																										
3.1	Evaluation of Deployments	O&R																								
3.2	Market Dissemination	O&R																								
3.3	Identify Additional Deployments	O&R																								
3.4	Integration of Interconnection Screens	O&R																								

3.3 Budget Review

Budget information is being filed separately with Department of Public Service Staff.

4.0 Conclusion

4.1 Lessons Learned

Lessons learned to date have been primarily associated with understanding the amount of time required to address the level of complexity and items that must be addressed in the contracting phase of the Project.

For Large projects, O&R has fully executed the contract with SGS. As part of the contracting process, O&R required SGS had to complete a detailed vendor risk assessment (“VRA”). This VRA includes a cyber risk assessment. The Project team had to work with SGS and our IT experts so that all parties understood how the Project will control and curtail the output of the PV. This was a time-consuming process. Because the Company has not previously implemented this technology, the Company went through all the IT applications and system architecture integration with our DSCADA system very carefully.

The Company also conferred with SGS on the risk, insurance and liability component of the Transaction Agreement. The Project team worked collaboratively with SGS, to explain the risk that will be incurred by O&R if the device fails to react properly. The Project team also discussed what equipment in the field will be affected by this failure. The Project team looked at various aspects of Project revenue and risk implication due to equipment failure to arrive at a funding amount for risk, insurance and liability that is appropriate for the Project.

4.2 Recommendations

The Company recommends continued focus on curtailment analysis for large projects. The Project team will continue to identify eligible projects through completed CESIR studies to begin outreach towards the high priority projects. The Project team will also explore additional solutions for Mid-sized projects, as well as solicit potential partners who can test the alternative technology.

As the Company moves forward in the process, the Project team hopes to gain more insight and lessons learned into the technology and its integration with the distribution system, analysis needed to identify ideal projects, and proper interaction with third-party developers to promote the Project.