

## **Case Study: PowerShift Atlantic Intelligent Load Management**

Integral Analytics is providing load aggregation service to the PowerShift Atlantic Project through the utility partners: Energie NB Power, Nova Scotia Power Inc., and Maritime Electric Company Ltd. The PowerShift Atlantic Project focuses on finding more effective ways to integrate wind energy into the electricity system across the Canadian Maritime provinces. PowerShift Atlantic (PSA) is a collaborative research project that is introducing proven technologies for energy management in commercial and residential buildings aimed at “shifting” when customers use electricity. The goal is to transform electricity production and management to reduce greenhouse gases and allow utilities to efficiently introduce wind energy onto the grid.

Integral Analytics was selected as a load aggregator for the PSA project to help continuously balance the variation in wind power, absorb periodic wind generation peaks, and help the utilities to more effectively incorporate wind generation. The technology enables the utilities to dynamically time shift the use of electricity by providing near real-time control of HVAC equipment, and water heaters.

Integral Analytics’ patented IDROP (Integrating Dispatchable Resource into Optimal Portfolios) allows us to proactively manage customer loads in a manner much like utilities have treated their generation resources. Specifically, IDROP is optimizing at a systems level, the micro-dispatching of 700 residential water heaters, 550 thermal storage space heaters and commercial coolers to provide the load reduction specified by the Virtual Power Plant (VPP) operator. IDROP uses proprietary forecasting and optimization engines to develop control and scheduling strategies to optimize the water heater control for the VPP.

IDROP uses the resource (water heater) level data collected via the HAN to develop load forecasts for each resource. IDROP then uses the load forecasts for all the controlled resources to develop an optimal dispatching strategy across the resources. This dispatching strategy can be thought of as choreographing the operation of the resource to achieve the VPP specific objectives, which may vary by season and by event. The two-way communications allows IDROP to know the device status in real-time so that adjustments can be made as the optimization strategies are implemented. The objective of this optimal dispatching strategy is to maximize utility value while maintaining customer comfort and preferences.

A Department of Energy (DOE) report entitled called “Demand Dispatch – Intelligent Demand for a More Efficient Grid” refers to PowerShift Atlantic as “the first project in the world to use aggregated load for the integration of wind power into the system”. This project will demonstrate that dynamic load control is essential to the integration of the increasing supply of renewable energy generation on the electricity grid.

For more information on the PowerShift Atlantic Project, please contact Bill Kallock at [bill.kallock@integralanalytics.com](mailto:bill.kallock@integralanalytics.com).