

Distribution System Operator Pilot / PowerShare

Grid Innovation Fund Project Details

Lead Proponent: Essex Powerlines Corporation

Partners: NODES, Essex Energy Corporation, Utilismart Corporation

Strategic Area(s):	Enabling Non-Wires Alternatives, Wholesale Market Integration
Project Total Cost:	\$8,088,778.20
Year Contracted:	2022
Status:	Active
Location:	Municipality of Leamington
Economic Development:	6 jobs estimated

Project Objectives

The project intends to demonstrate the operation of a local market run by a Distribution System Operator (DSO) using local resources to meet local needs in a region that is constrained from a local and bulk system perspective.

Approximately 60% of Ontario's greenhouses can be found in the Leamington Area. The high concentration of greenhouses in Leamington account for a significant amount of required load.

To mitigate local constraints on the grid and to create flexibility within the distribution system, Essex Powerlines will implement and run a local energy market where DER owners in the Municipality of Leamington will be able to sell their excess or stored generation, or to curtail, in response to local grid needs.

Essex Powerlines will perform as a Distribution System Operator (DSO), utilizing NODES' independent 3rd party market platform to facilitate transactions, provide metering, validation and settlement services.

The pilot project will develop Local Market Rules as well as a Transmission-Distribution Coordination Protocol for testing. The project will test the provision of wholesale grid services outside of the IESO-Administered Market (IAM) environment.

The project aims to demonstrate (1) the "total DSO model" where local flexibility is first provided to the local market and residual capacity simulated to be offered at the wholesale level, and (2) the "hybrid DSO model" where flexibility is provided to both the local (live) and wholesale (simulated) levels simultaneously. Wholesale-level demonstrations will be outside of the IAM environment.

Expected Outcomes

Key outcomes of this project include a deeper understanding of:

- The viability of a DSO structure in Ontario and the running of a local electricity market
- The performance of DERs and DER aggregations, and their ability to reliably meet real local needs and simulated wholesale needs in accordance with local and IESO Market Rules
- Transmission-distribution coordination processes
- The value of DERs as non-wires alternatives to mitigate local and bulk level constraints while deferring traditional infrastructure upgrades
- The level of engagement and interest from DER asset owners to provide grid services

Quantifiable outcomes include estimating the potential cost savings to customers in Essex Powerlines' service territory, quantifying the added value to DER asset owners for providing grid services, and quantifying the improvements to reliability and resilience for customers.

To follow the PowerShare journey please visit:

Web: www.powershare.energy

Twitter: @PowerShareDSO

LinkedIn: PowerShare: From Utility to Distribution System Operator