



Research case study > Renewables

Dual Participation of Local Demand Response Resources

Version 2 (July, 2026)

Context: With impending deep electrification, electricity demand is expected to soar. Building to peak will be challenging considering costs. Local Demand Response is a Toronto Hydro Non-Wires Alternatives program that leverages behind-the-meter Distributed Energy Resources (DERs) to address short-term station capacity constraints, enables grid flexibility, and avoids expensive traditional distribution system upgrades. This project aims to explore this solution for the future.

Problem: Lack of coordination between the provincial transmission/bulk system and Toronto Hydro's local operations to use the same demand response resources can result in conflicting dispatch signals. It also leads to more expensive and less synergistic procurement and use of resources, driving up costs and creating increased competition for scarce resources.

Solution: Develop a dual participation model and supporting platform to enable seamless coordination and allow the same DERs to serve both local and provincial grid needs. To enable this project, a coordination mechanism between demand response activation requests from the bulk and local electricity systems was created. Together with a bulk market simulator, and load forecasting tool, a new triaging software called the wholesale distribution demand response coordination operator (WDDCO) were created. Using these tools, the project triaged demand response activation requests and forwarded them to demand response resources in total of 6 MW. The program ran for the first time in 2022, and has annually operated since then to 2026 from May to Oct each year. Preceding the operations, vendor registration, offer submissions, and auction settlement tools were created and used.

Impact: Supports resilient grid infrastructure, reduces the need for capital-intensive upgrades, and advances Ontario's goals around sustainability and system innovation. Flexibility tools leveraging distributed energy resources are explored and leveraged.

CUE's Role: CUE led the research and tool development, in collaboration with Toronto Hydro and Power Advisory LLC, with support from the IESO Grid Innovation Fund and the OEB Innovation Sandbox.

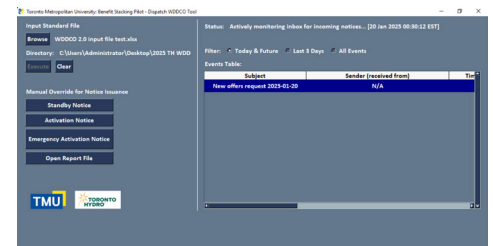


Figure 1 WDDCO Tool

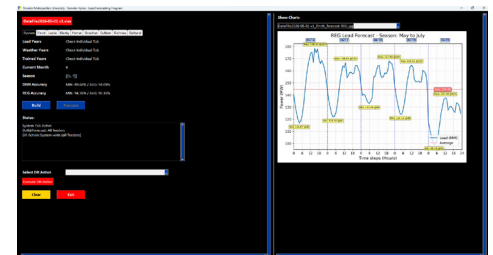


Figure 2 Load Forecasting Tool

Partners: Toronto Hydro

Timeline: 2023 – 2026

Research team:

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Key Stats:

16 Technical Reports
5 Software