NON-WIRES ALTERNATIVES

LOCAL DEMAND RESPONSE

September 13, 2022

Rei Marzoughi

Manager, Non-Wires Alternatives

AGENDA

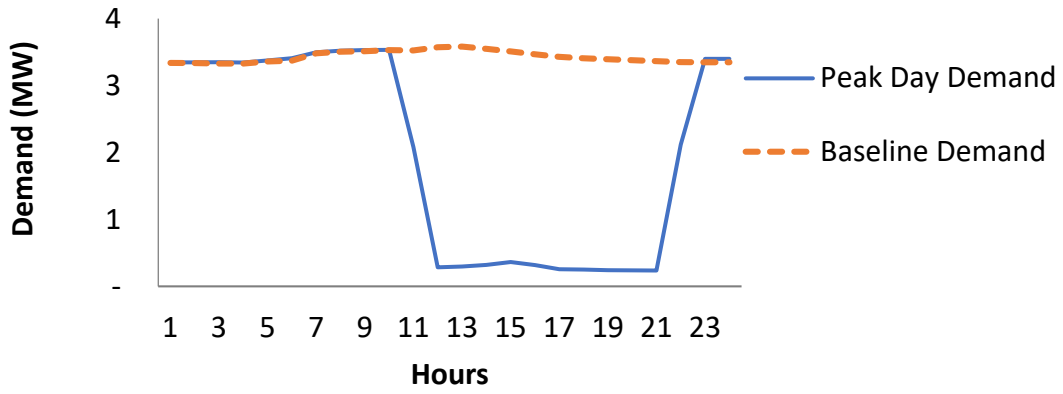
1. Overview of Local Demand Response (LDR)
2. How Does it Work? Planning Phase
3. How Does it Work? Execution
4. How Does it Work? Pilot Timeline
5. Benefits and Challenges
6. Questions and Discussion

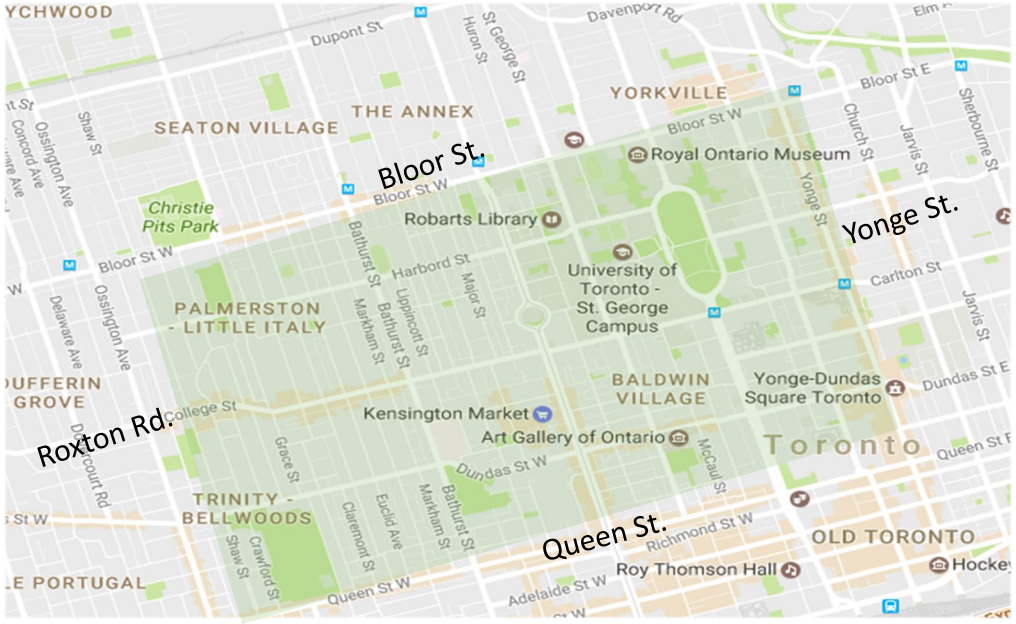
LDR OVERVIEW

Local Demand Response (LDR) is a Toronto Hydro Non-Wires Alternatives (NWA) program, aimed at leveraging behind-the-meter Distributed Energy Resources (DERs) to address short-term station capacity constraints.

2015-2019 LDR at Cecil Transformer Station (TS)

- Contractual Demand Response (DR) program working with commercial/institutional customers
- Reduced summer peak demand by 8 MW in 2018/2019
- Resource mix included back-up behind-the-meter generation and customer load curtailment activities
- 5-6 events per year, delivered over a 4-hour period (11 a.m. to 3 p.m.)





(Source: Google Maps)

LDR OVERVIEW

2020-2024 LDR at Manby TS and Horner TS

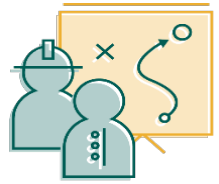
- Benefit Stacking Pilot, funded by rates & IESO Grid Innovation Fund (GIF), supported by OEB Innovation Sandbox
- Contracting for 9 MW of DR for summer 2023/2024
- Customers participating in LDR can enable Toronto Hydro to utilize capacity in IESO markets on their behalf

Pilot Goals

- New market participation pathway – exploring LDC as aggregator
- Coordination – develop protocols for T-D coordination of DR
- Data and analysis – quantify costs and benefits
- Regulatory innovation – identify barriers, provide options

(Source: City of Toronto)

PARTNERS



Power Advisory

Toronto Metropolitan University
Centre for Urban Energy

HOW DOES IT WORK?
PLANNING PHASE

Station Selection & Target Setting

- Review station needs
- Determine needs addressable by NWAs

Assess Locational Value

- Identify conventional solutions potentially displaced by NWAs

Procurement Planning

- Define program parameters
- Create strong contracts
- Measurement and Verification (M&V) process
- Settlement process

HOW DOES IT WORK?
EXECUTION

Procurement

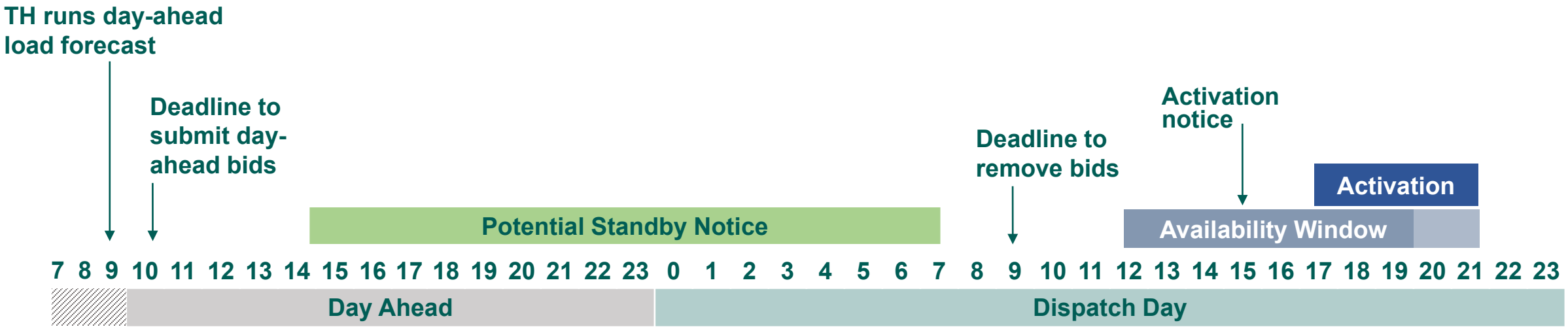
1. Procure LDR Capacity → 2. Participate in IESO Capacity Auction with LDR Capacity*

Dispatch and Settlement

1. Pre-dispatch activities	Run day-ahead load forecast to determine dispatch schedule	Offer LDR capacity in IESO day-ahead market on a daily basis*	
2. Dispatch activities	Determine Dx dispatch schedule	Receive Tx dispatch schedule from IESO*	Indicate HDR availability via offers in IESO day-ahead market*
3. Settlement	Verify participant provided capacity as instructed (M&V)	Pay participant for Dx services (LDR)	Pay participant for Tx services (GIF)

*simulation

HOW DOES IT WORK?
PILOT TIMELINE



- Toronto Hydro (TH) runs day-ahead load forecast by 9:00 EST
- HDR bids must be submitted in the day-ahead process by 10:00
- Standby notices sent out between 14:00 day-ahead to 7:00 on dispatch day
- If not on IESO standby, TH must remove bids by 9:00
- If activated by IESO, TH receives notice from IESO no less than 2 hours before the start of the activation period

BENEFITS AND CHALLENGES

Cost Optimization
Capacity effectively procured/deployed

Flexible/Fast-to-Market
Performance-based agreements

Responsive to Customers
DER integration, grid participation

Grid Innovation
Innovation that benefits ratepayers

Integration
Planning, IT, data

Regulatory
Opex-driven

Price-setting
Correct price signals, free-ridership

Coordination
T-D protocols

Connect with us

TORONTO HYDRO®