

NON-WIRES ALTERNATIVES

LOCAL DEMAND RESPONSE

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AGENDA



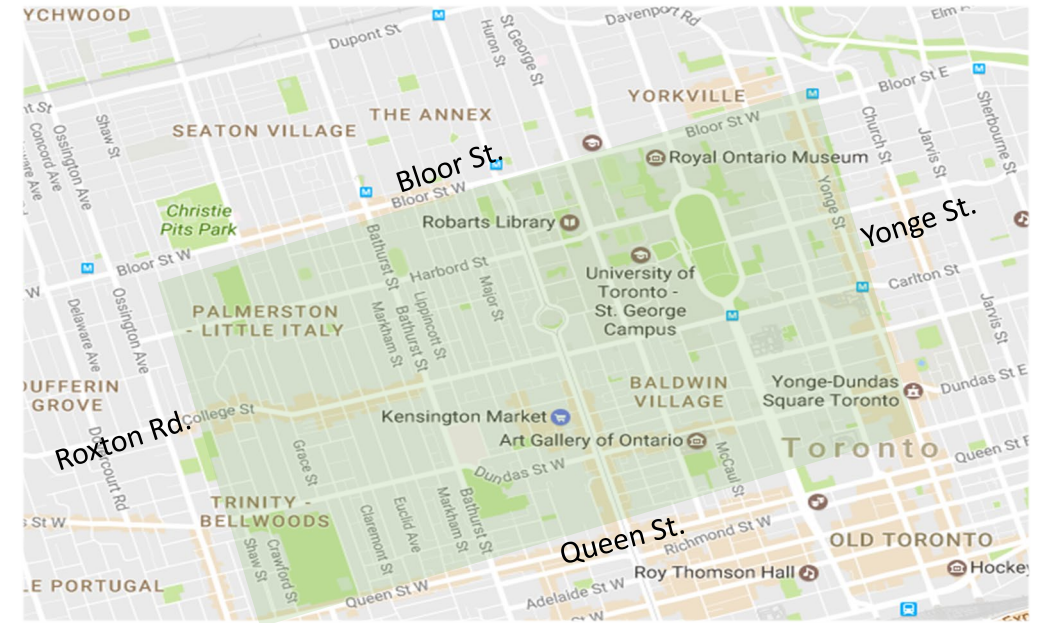
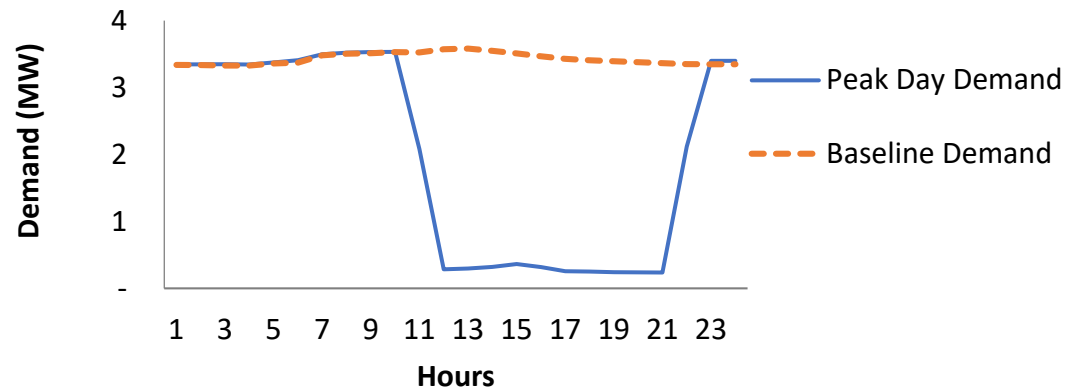
- 1 Overview of Local Demand Response (LDR)
- 2 How Does it Work? Planning Phase
- 3 How Does it Work? Execution
- 4 How Does it Work? Pilot Timeline
- 5 Benefits and Challenges
- 6 Questions and Discussion

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

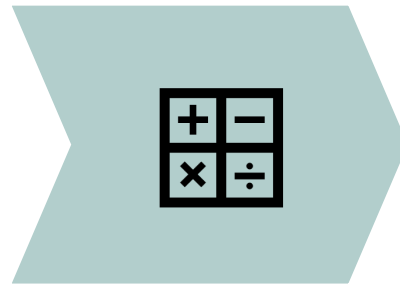
HOW DOES IT WORK?

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)

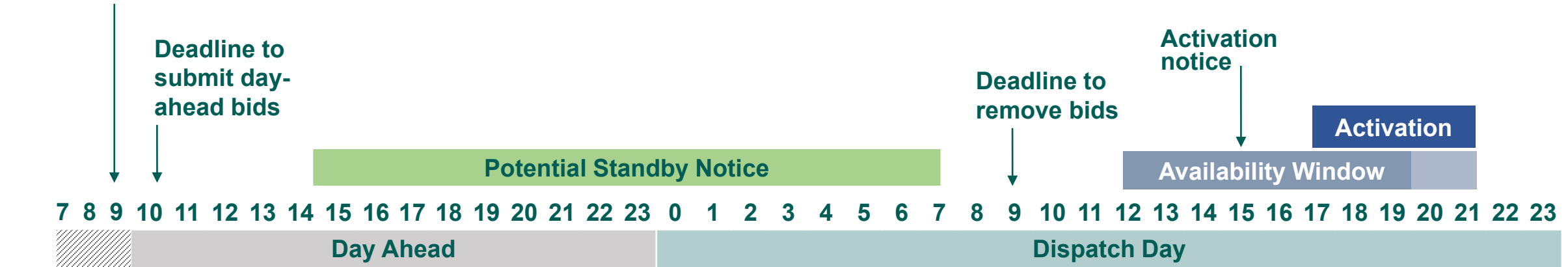
*simulation

HOW DOES IT WORK?

PILOT TIMELINE



TH runs day-ahead load forecast



- 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



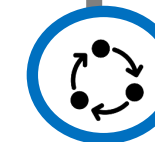
Regulatory

Opex-driven



Price-setting

Correct price signals, free-ridership



Coordination

T-D protocols



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