

TDWG Planning Presentation

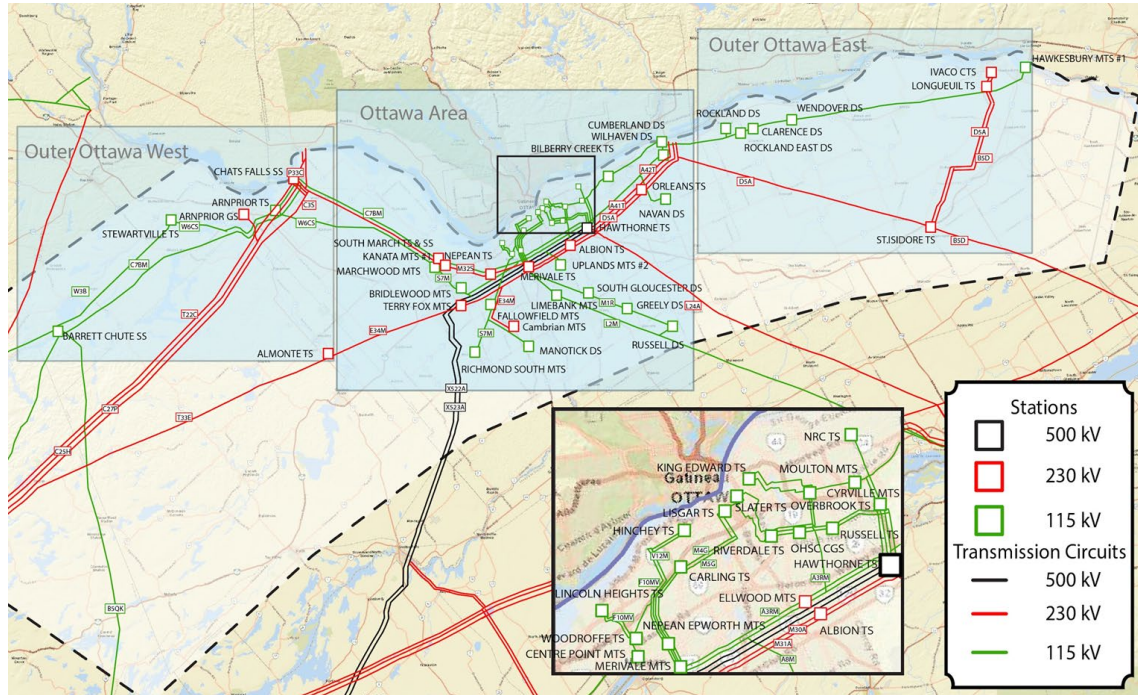
Hydro Ottawa's Planning Process

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Load and Growth Forecasting

Transmission Supply & Hydro Ottawa Service Territory



- The Ottawa area is primarily supplied by 500 kV circuits from Lennox TS (located in Lennox and Addington County)
- The region is further supplied through a network of 230 kV and 115 kV circuits

Peak Review- Setting the Baseline

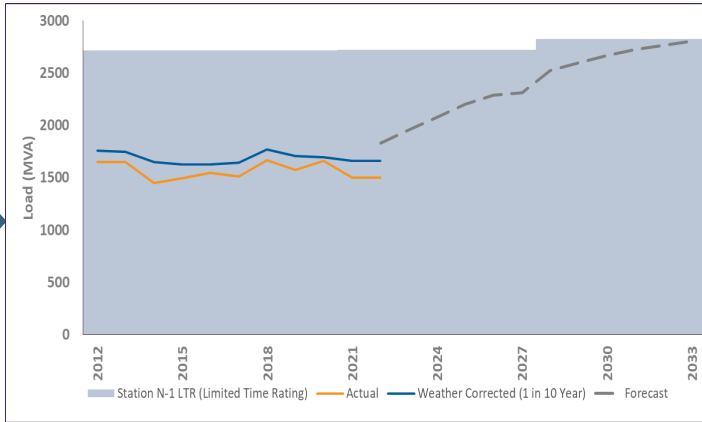
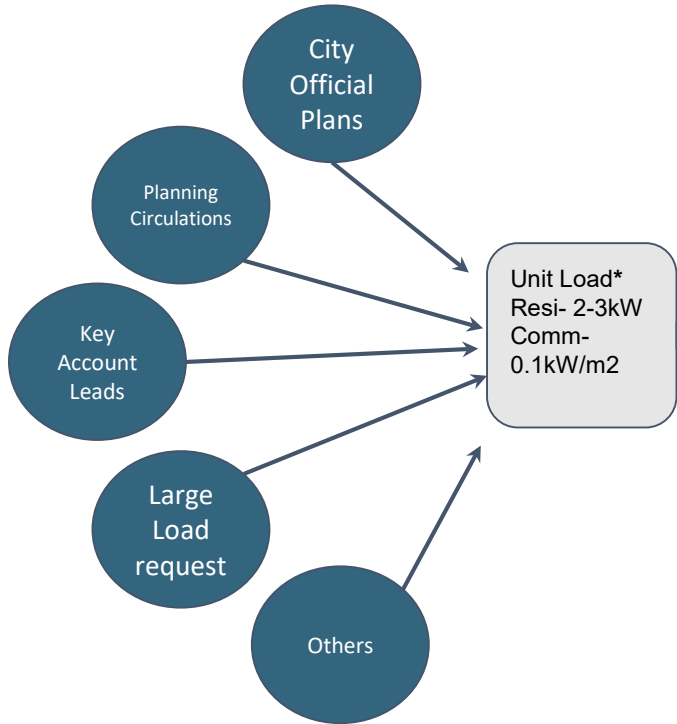
1. Coincident peak demand on feeders on the hottest hour of the year
1. Bringing the system back to normal configuration
1. Eliminating extreme temperature impacts on load-weather normalized peak
1. Rolling it up to the Station peak

		Annual Feeder Peak Review	
	Peak Demand (Actual)	Peak Demand (Normal config)	Weather Normalized Peak
Feeder 1	10	10	9
Feeder 2	20	10	9
Feeder 3	0	10	9



Station Peaks	
	Weather Normalized Peak
Station 1	20
Station 2	30
Station 3	50

Growth Forecasts

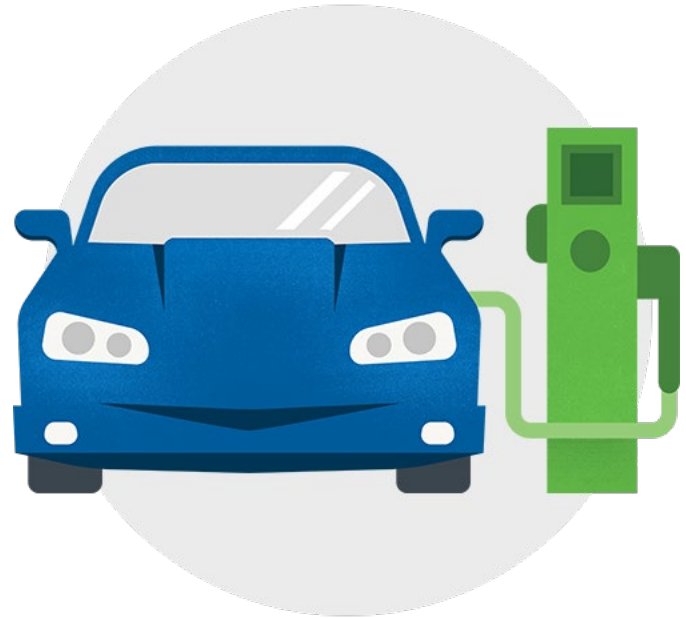


- Based on the need scope out capacity upgrade projects for 5 to 20 year period
- Justify need in the Rate Application
- Move ahead with execution and energization

*This does not include impacts of electrification

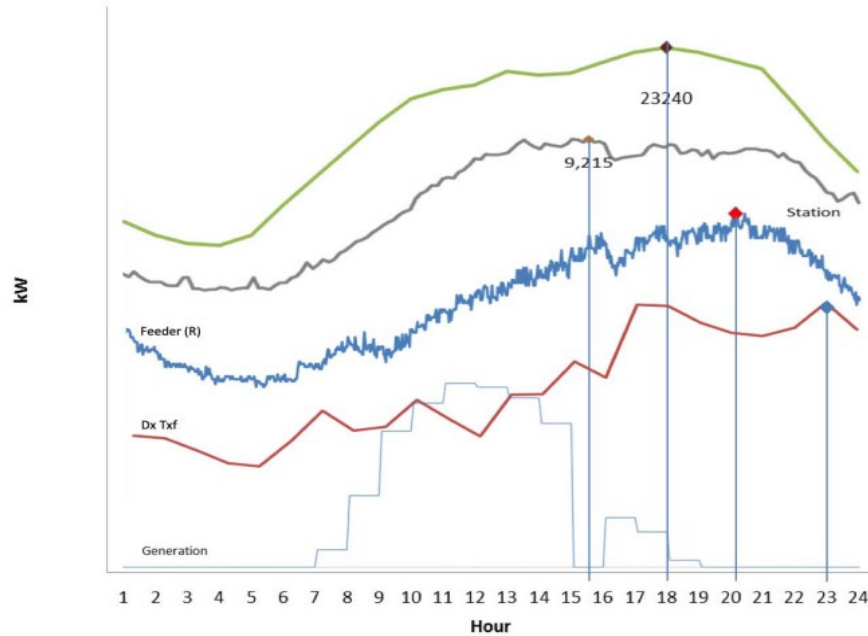
Planning Challenges

- Net Zero Federal, Provincial and City targets
 - Many unknowns that make future and operational Planning difficult
 - Magnitude and location of new loads (demand estimates)
- DER limitations
 - Visibility
 - Non-dependable generation
 - Typically, planning is based on the maximum static case
 - Lack of DER control on our grid
 - System constraints (short circuit, thermal constraints, etc.)



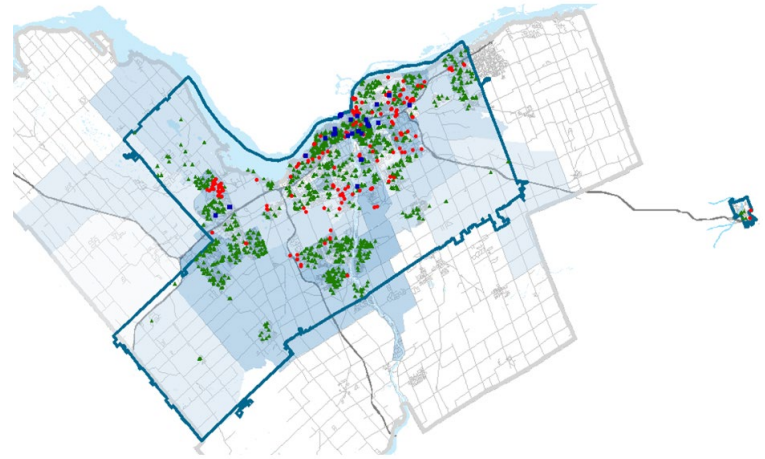
Non -Coincident Peaks Example

Ontario Market Demand (Sep 5, 2018)



Next Steps

- Pilot Projects - EV Everywhere (next slide)
- Explore opportunities for collaboration between LDC and customer
- Engage with consultants to understand impacts of EVs and electrification
- Continue to collaborate with IESO on Demand-Side Management initiatives, DER management framework and protocols, NWAs, and other initiatives such as the Grid Innovation Fund for EV Everywhere
- Keep the system ready by adapting LDC standards, planning and operating practices

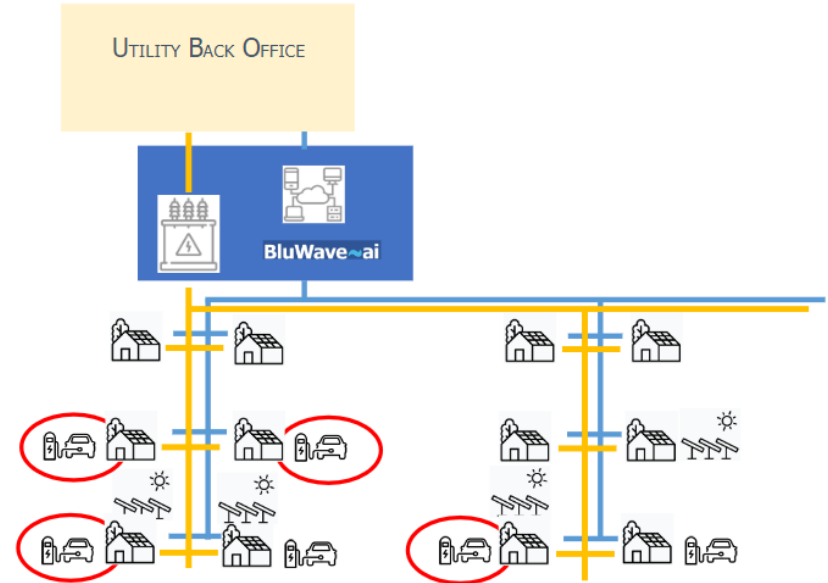


EV Everywhere

IESO GIF initiative / Sandbox for the IESO, LDC, and aggregator participation framework protocol

Program addresses impacts for:

- Hydro Ottawa
 - Impact on low and medium voltage distribution network of EV Clusters
 - Realtime predictions on load trends
 - Acceptance of signals from Operations for load shifting or injection of battery energy
- IESO
 - Participation in IESO Administered DER markets

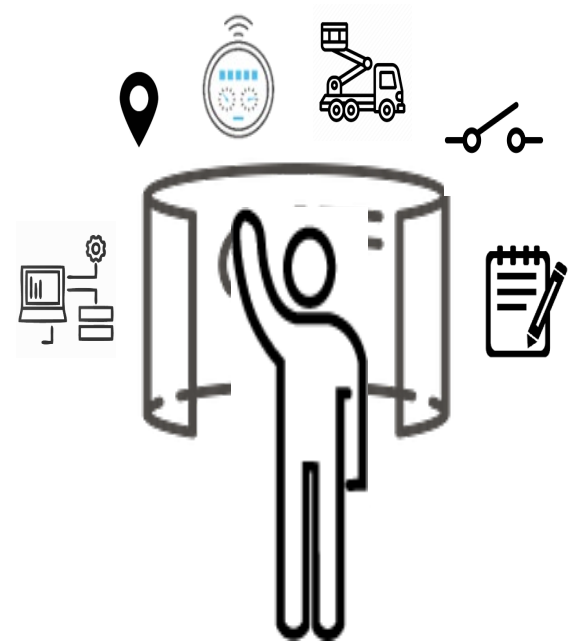


ADMS

Advanced Distribution Management System

- Real time energy flow
- Use DERs as NWA

Hydro Ottawa's ADMS will be ready for use by 2025



Comments or Questions?

Unit Load Estimates

Table 2: Commercial Load⁷

Type	Unit Demand (kW) / m ²
Office	0.043
Food Services	0.0992
Light Industrial	0.0537
Mall	0.0537
Commercial	0.0537
Healthcare	0.031
Retail	0.031
Education	0.031
Warehouse	0.0099
Storage	0.0099

Table 3: Residential Load (Includes Public Load)

Type	Unit Demand (kW)
Townhouse	2.06
Single Home	2.84