APRIL 28, 2022

Niagara Regional Electricity Planning

Engagement Webinar #2

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Objectives of Today's Engagement Webinar

- To provide an update on the electricity planning underway in the Niagara Region
- To seek feedback on the preliminary electricity needs and the screening of high-level potential options identified for the Niagara Integrated Regional Resource Plan (IRRP)
- To outline next steps

Agenda

1. Niagara Region Electricity Planning Status Update and Recap
2. Preliminary Electricity Needs
3. Screening of Needs and Options
4. Community Engagement and Next Steps

Seeking Input

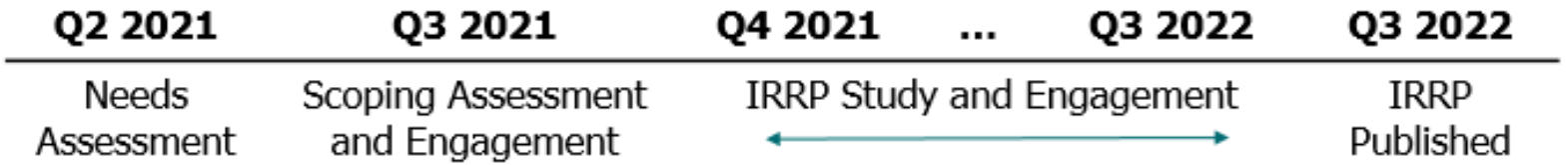
- What feedback do you have on the screening of high-level potential options?
- What additional information should be considered as we screen high-level potential options?
- What information should be provided in future engagements?

Please submit your written comments by email to engagement@ieso.ca by May 19

Niagara Region Electricity Planning Status Update and Recap

Summary of IRRP Progress to Date

- The reference electricity demand forecast has been finalized with the Technical Working Group, informed by engagement on key developments, projects, priorities, and initiatives
- Preliminary needs have been defined and screening of high-level potential options is underway; technical study work continues



IRRP Technical Working Group

Team Lead, System Operator	• Independent Electricity System Operator
Lead Transmitter	• Hydro One Networks Inc. (Transmission)
Local Distribution Companies	• Alectra Utilities • Canadian Niagara Power Inc. • Grimsby Power Inc. • Hydro One Networks Inc. (Distribution) • Niagara on the Lake Hydro Inc. • Niagara Peninsula Energy Inc. • Welland Hydro Electric System Corp.

Recap: Engagement Activities to Date

- Engagement launched for Niagara Region electricity planning – July 2021
  - Draft Scoping Assessment Report posted for public comment and public webinar held to help inform regional needs and the appropriate planning approach to address them – August 2021
  - Final report posted following written comment period that determined the need to develop an electricity plan for the region – August 2021
- Meetings with local municipalities to discuss planned growth and development, projects and priorities to help inform electricity demand forecast and engagement plans – December 2021/January 2022
- Public webinar #1 to seek input on draft electricity demand forecast and planned engagement activities – February 3, 2022

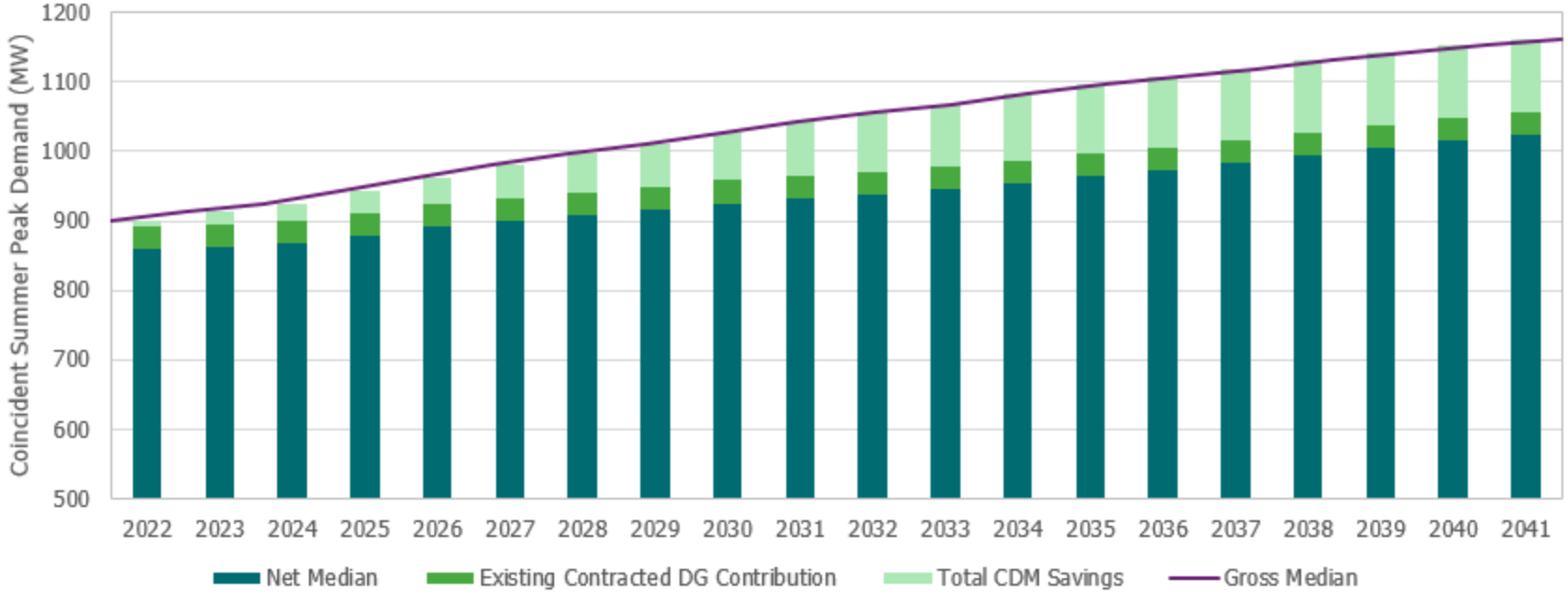
What we've heard so far…

- Strong population growth across the Niagara region based on 2051 growth projections
- Notable growth in the Town of Lincoln (greenhouses, Secondary Plan areas, potential GO Transit development) and Thorold
- Strong economic development around the Welland Canal (e.g. Thorold Multimodal Hub "Niagara Ports")
- Key areas of growth in the City of Niagara Falls within intensification nodes and corridors, projects around the GO Transit Station and the new Niagara South Hospital, wastewater treatment plant, and residential new construction

What we've heard so far…(2)

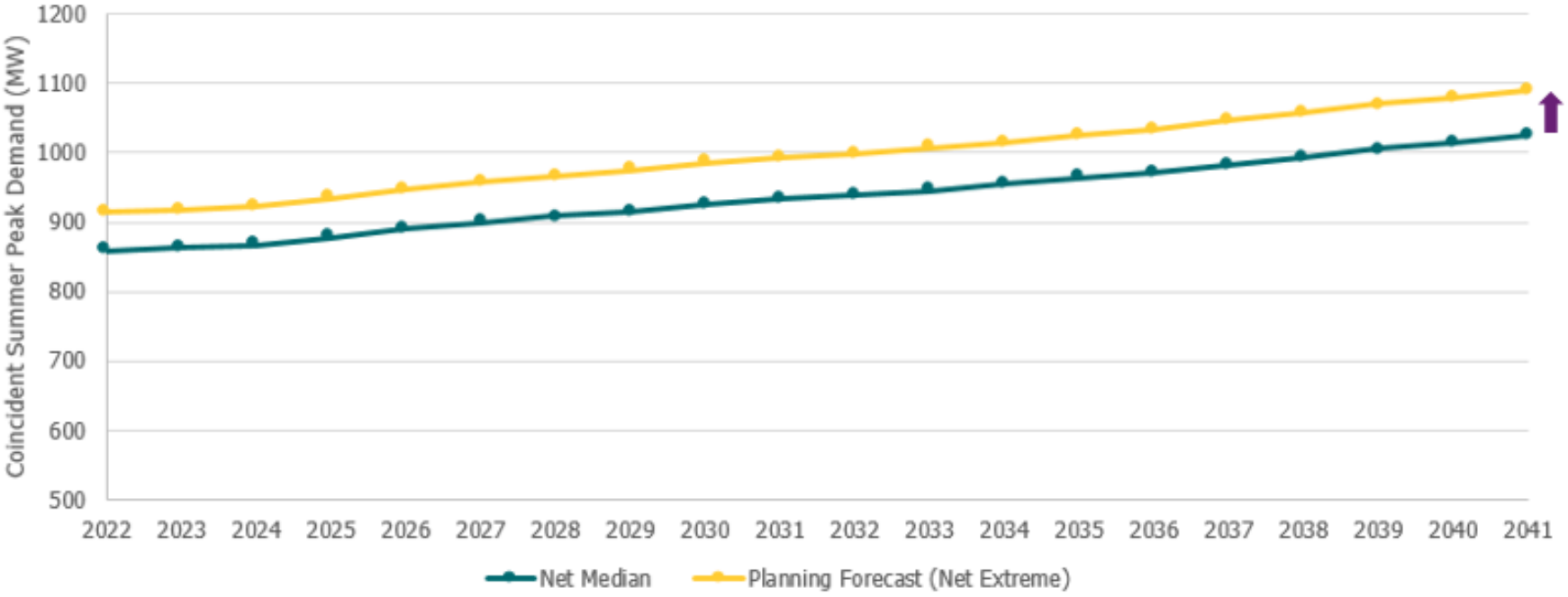
- Industrial, commercial, institutional, and residential development in the Town of Fort Erie and Secondary Plan areas
- Potential urban boundary expansion in the region totaling 130 hectares of residential and 150 hectares of employment lands
- Climate change drivers (e.g. Niagara Adapts: partnership with Brock University and seven Niagara Region municipalities to develop a Climate Change Adaptation Plan)

Developing the Reference Demand Forecast



DG: Distributed Generation, CDM: Conservation and Demand Management

Final Reference Niagara Region Planning Forecast



Preliminary Electricity Needs

Recap: Categories of Needs

Capacity Needs

- Station capacity refers to the ability to convert power from the transmission system down to distribution system voltages
- System capacity (or "load meeting capability") refers to the ability of the electricity system to supply power to customers in the area, either by generating the power locally, or bringing it in through the transmission system

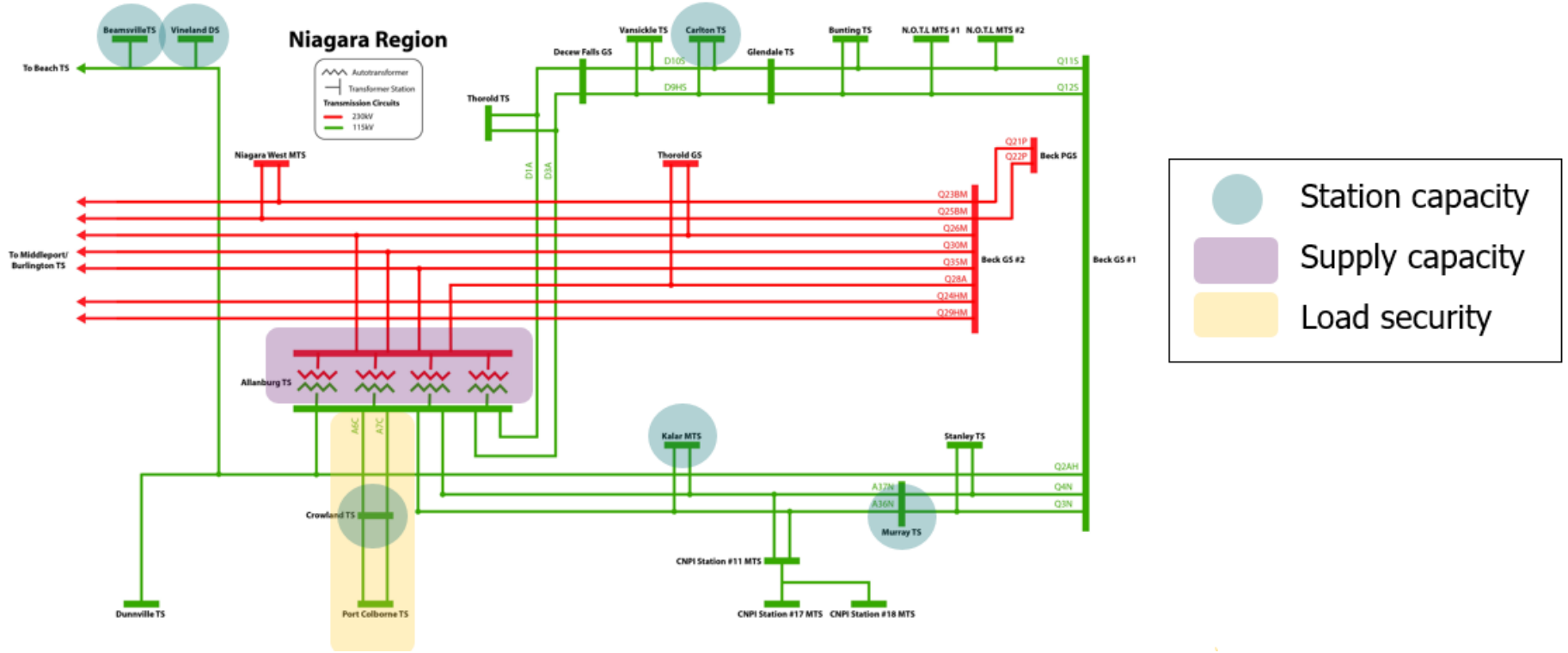
End-of-Life Asset Replacement Needs

- Based on the best available asset condition information at the time
- Evaluated to decide if the facility should be replaced "like-for-like", "right-sized", or retired

Load Restoration and Supply Security Needs

- Load restoration describes the electricity system's ability to restore power to those affected by a major transmission outage within reasonable timeframes
- Supply security describes the total amount of load interrupted following major transmission outages

Preliminary Niagara Electricity Needs (1)



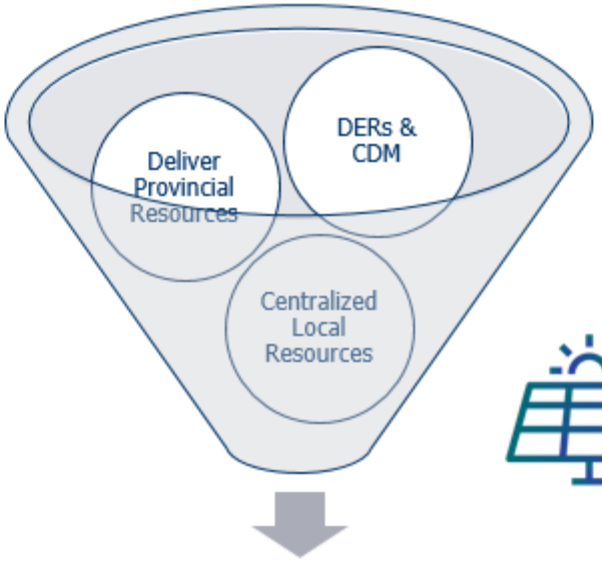
Preliminary Niagara Electricity Needs (2)

Need Type	Impacted Element	Timing (yrs)	Size (MW) (in 1st need year, in 2041)
Station Capacity	Beamsville TS	0	12, 24
	Crowland TS	1	1, 22
	Murray TS (T11/T12)	0	4, 11
	Carlton TS	9	1, 8
	Kalar MTS	12	0.1, 5
	Vineland DS	10	0.1, 2
Load Security	Allanburg TS to Port Colborne TS area	0	30, 55-75
Supply Capacity	115 kV sub-system	*still being studied and refined*	

Screening of Needs and Options

Possible Options in IRRPs

Traditional "wires" option to supply the local area with system resources (may include operational actions and schemes)

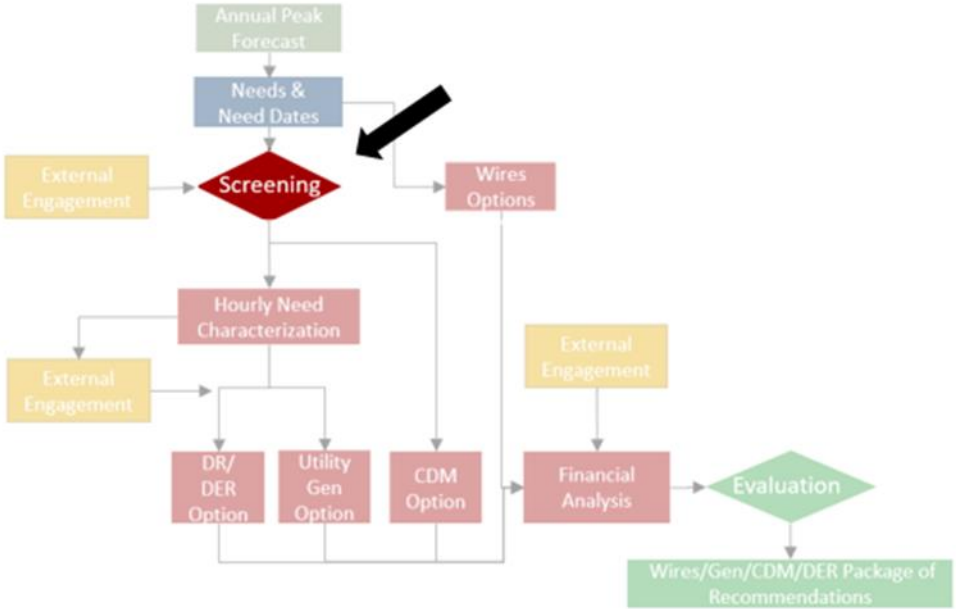


Non-wires alternatives (NWAs) like distributed generation (DG) or conservation & demand management (CDM)

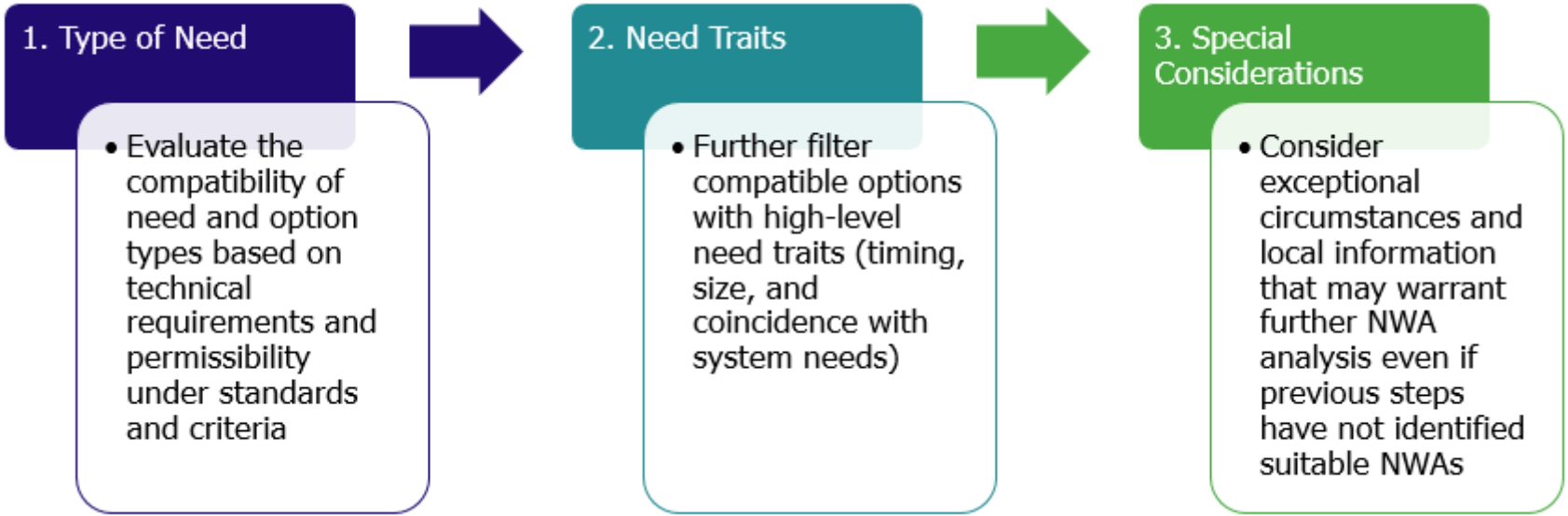
Strategically-sited local generation to address transmission infrastructure limitations

Purpose of the Screening Mechanism

- Screening occurs early in the IRRP study after local reliability needs are known but before options analysis
- Screening identifies opportunities where NWAs are most likely to succeed, to better focus options analysis and stakeholder discussions
- It helps direct time-intensive aspects of detailed NWA analysis (hourly need characterization, options development, financial analysis, and engagement) towards the most promising options

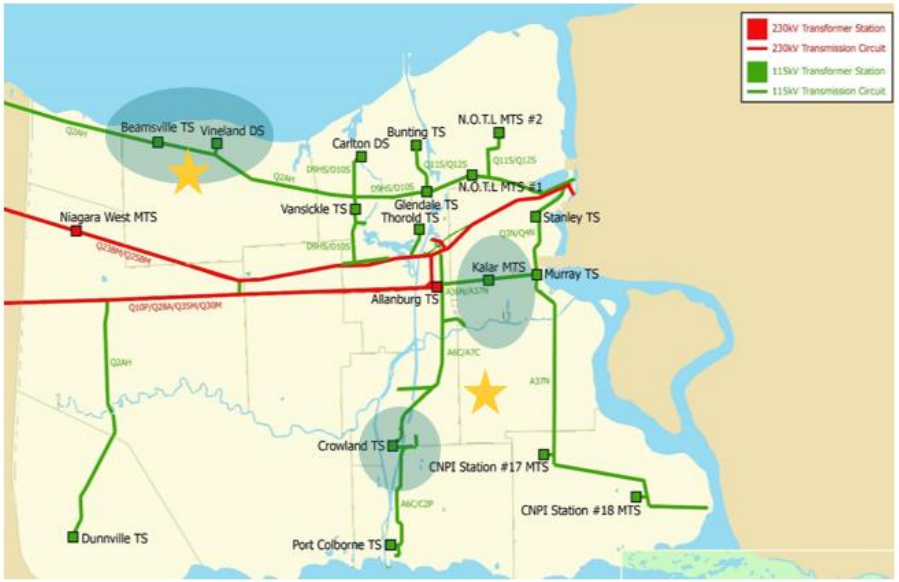


Screening Mechanism Steps



Refer to the appendix for detailed screening criteria in Steps 1-2.

Considerations for Niagara During Screening



★General area of growth

- Along with the screening criteria used in Steps 1 and 2, options were scoped in/out according to early information known through the Technical Working Group
- These considerations include:
  - Grouping of the geographic areas requiring new capacity (Grimsby & Lincoln, Welland & south Niagara Falls)
  - If there is a likely or already-known inexpensive & simple wires alternative, or operational action (as is the case for Murray TS and Carlton TS)

Long-Term Considerations

- Proposed outcomes of the screening also reflect:
  - The benefits of proceeding with NWA analyses to support and identify a long-term plan for the Niagara region
  - The opportunity for broader hybrid solutions; for ex., CDM could be targeted to the areas of growth for long-term load management/wires deferral, in tandem with generation and/or DR measures that can be evaluated as near-term solutions
- Both integrated non-wires and wires alternatives will be assessed

Proposed Outcomes of the Screening for Niagara

Need Type	Impacted Element	Timing (yrs)	Size (MW) (in 1st need year, in 2041)	Screened In	Screened Out	
Station Capacity	Beamsville TS Vineland DS	0	12, 24	Demand response (DR), DG, CDM	Transmission-connected generation	Grouped geographically
		10	0.1, 2			
	Crowland TS Kalar MTS	1	1, 22	DR, DG, CDM	Transmission-connected generation	Grouped geographically
		12	0.1, 5			
	Murray TS (T11/T12)	0	4, 11		All NWAs	
	Carlton TS	9	1, 8		All NWAs	
Load Security	Allanburg TS to Port Colborne TS area	0	30, 55-75		All NWAs	

Next Steps

Next Steps

- May 19 – Deadline for written feedback on screening of high-level options
- June 2 – Responses to written feedback and additional data posted
- Q3 2022 – Final public webinar to seek input on options analysis and draft recommendations
- Q3 2022 – Final IRRP
- Q3/Q4 2022 – Southwest Regional Electricity Network Forum

Your Feedback is Important

- What feedback do you have on the screening of high-level potential options?
- What additional information should be considered as we screen high-level potential options?
- What information should be provided in future engagements?

Please submit your written comments by email to engagement@ieso.ca by May 19

Keeping in Touch

- Subscribe to receive updates on the Niagara regional initiatives on the IESO website – http://www.ieso.ca/subscribe > select Niagara Region
- Follow the Niagara regional planning activities online – https://www.ieso.ca/en/Get-Involved/Regional-Planning/Southwest-Ontario/Niagara
- Dedicated engagement webpage – https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Regional-Electricity-Planning-Niagara
- Regional Electricity Networks provide a platform for ongoing engagement on electricity issues – https://www.ieso.ca/en/Get-Involved/Regional-Planning/Electricity-Networks/Overview > join Southwest Network

Questions?

Do you have any questions for clarification on the material presented today?

Submit questions via the web portal on the webinar window, or by email to engagement@ieso.ca

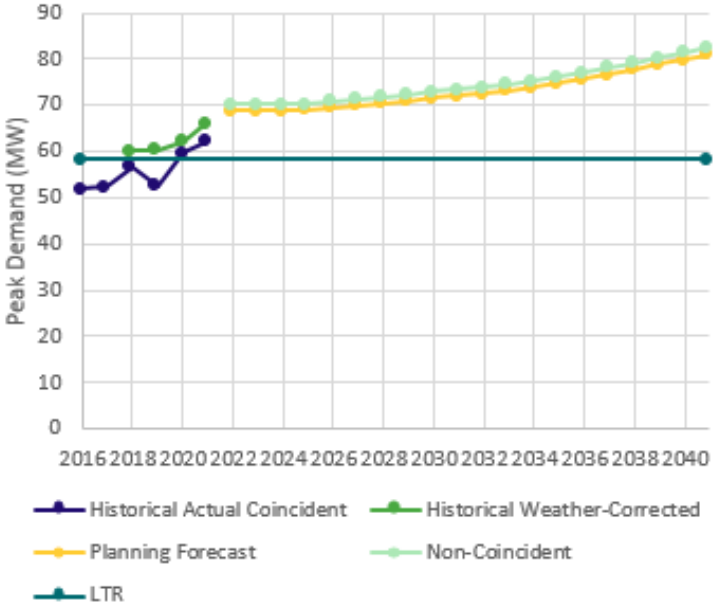
Seeking Input on the Webinar

- Tell us about today
- Was the material clear? Did it cover what you expected?
- Was there enough opportunity to ask questions?
- Is there any way to improve these gatherings, e.g., speakers, presentations or technology?

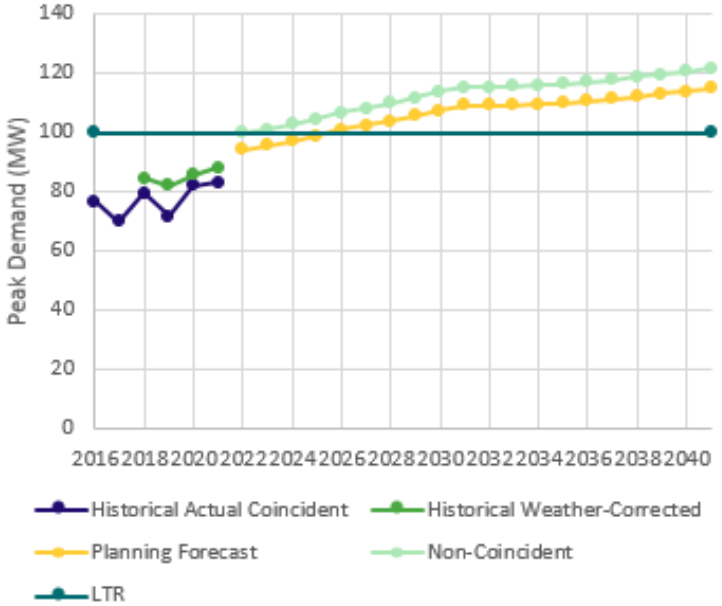
Chat section is open for comments

Appendix A: Niagara IRRP Needs

Beamsville TS

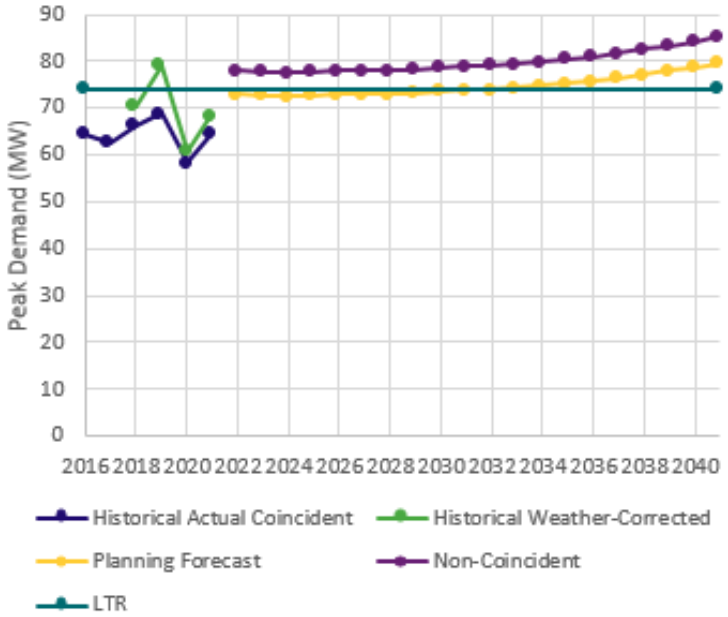


Crowland TS

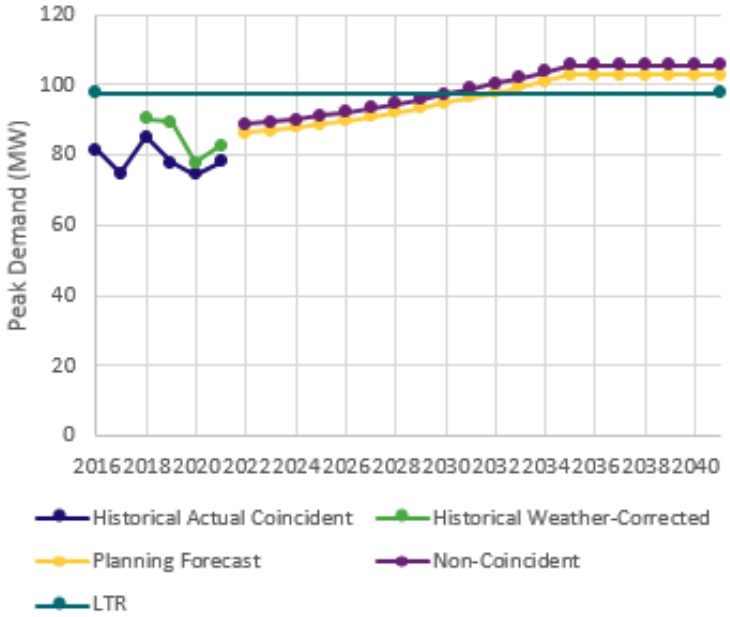


LTR: Limited Time Rating

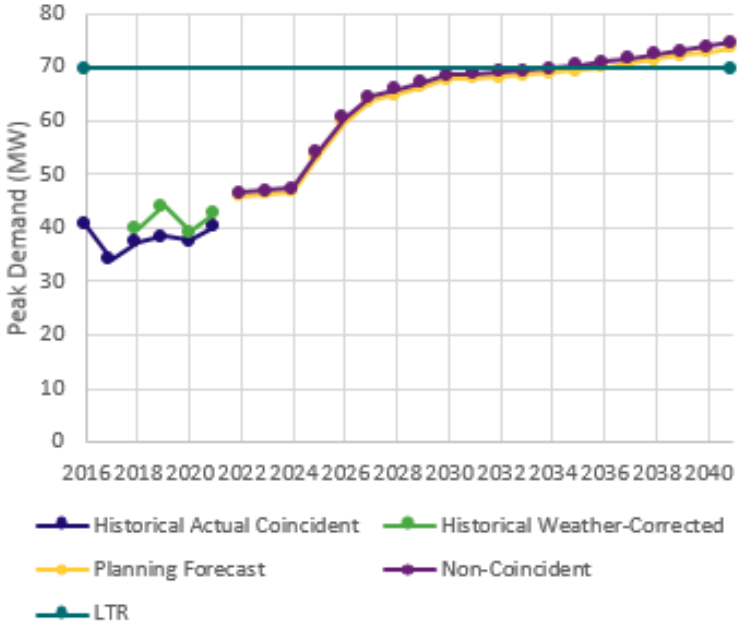
Murray TS (T11/T12)



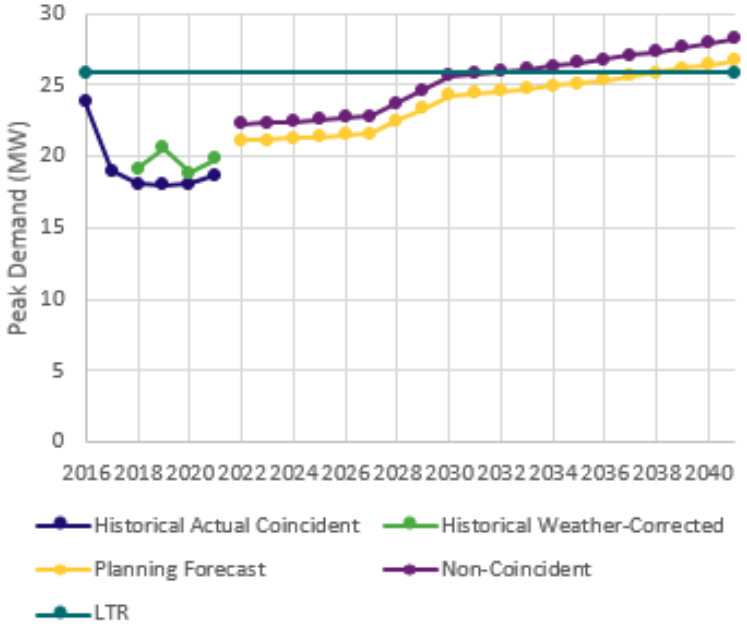
Carlton TS



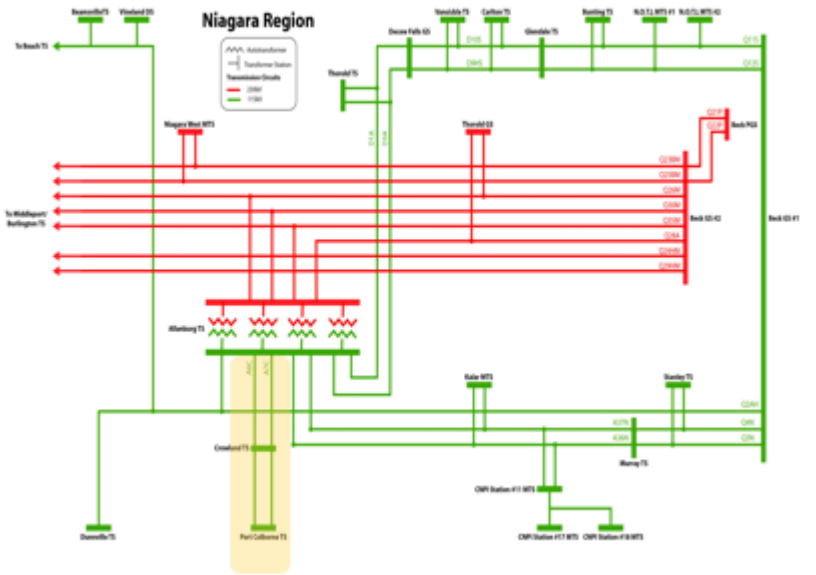
Kalar MTS



Vineland DS



Load Security Need



- Planning criteria (Ontario Resource and Transmission Assessment Criteria, or ORTAC) outline limitations on how much load can be rejected or interrupted by configuration during different contingencies, depending on system conditions
- Preliminary studies indicate a violation of ~30-75 MW of load rejection in the Crowland TS to Port Colborne TS area
- This is specific to double contingencies occurring on Q26M and Q28A

Appendix B: Screening

Screening Step 1: Type of Need

Option	Supply Capacity Need	Station Capacity Need	Load Security Need
Tx-connected generation or storage	Yes	No	No
Energy efficiency	Yes	Yes	No
Distributed generation	Yes	Yes	No
Demand response	Yes	Yes	No

NWA analysis may not be warranted if:

- Control actions (e.g. load rejection for N-1-1 needs) are sufficient to meet the need
- There is high potential for an inexpensive, simple wires alternative (i.e., load transfer, reconfiguration)

Screening Step 2: Narrow Down Options with High-Level Need Traits

Option	Need timing	Size of need	Need's coincidence with system peak
Tx-connected generation or storage	>3 years	Unlimited	Generation can likely provide system value during provincial peaks even if local need is not coincident
Energy efficiency (i.e., CDM)	>4 years	<2% of load forecast in each year	Energy efficiency can target needs that are not coincident with system peaks, but provincially-funded energy efficiency should reduce system peaks
Distributed generation	>4 years	<DG connection space	Generation can likely provide system value during provincial peaks even if local need is not coincident
Demand response	>2 years	Proportional to historically offered in zonal auction	DR can target needs that are not coincident with system peaks, but the Capacity Auction acquires resources designed to meet system peaks

Estimated DG Connection Space

Station	Existing Installed Contracted DG (MW)	Short Circuit Allowance (MVA)	Thermal Limit Allowance (MW)
Beamsville TS (BY)	2 (solar)	365	29
Crowland TS (QY)	13 (solar), 10 (water)	62	29
Kalar MTS	1 (landfill gas)	To be determined	To be determined
Vineland DS (T1)	0.3 (biomass), 0.3 (solar)	415	12
Vineland DS (T2)		419	14

Actual connection feasibility would be subject to further studies. Resources to estimate DG connection capacity can be found on the Hydro One website. For up to date information please contact local distribution companies.