JUNE 17, 2024

Kitchener/Waterloo/Cambridge/Guelph Regional Electricity Planning

Engagement Webinar

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Agenda

- Ontario's Electricity Sector
- Regional Electricity Planning Process and the Kitchener/Waterloo/Cambridge/Guelph (KWCG) Region
- Draft Scoping Assessment
- Next Steps and Engagement
- Discussion

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We work with:

Generators >>> **Transmitters** >>> **Local Distribution Companies** >>> **Energy Consumers**

<<< **Communities** >>>

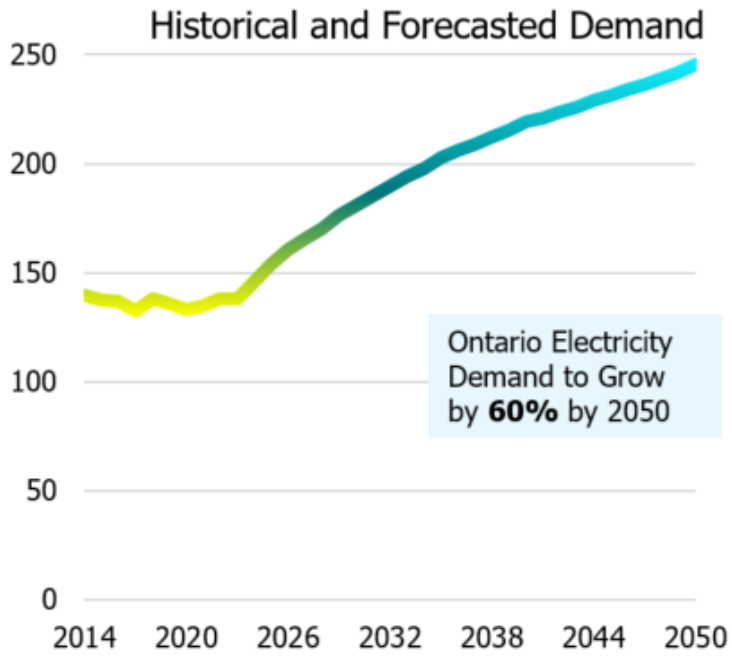
Ontario's Changing Electricity Landscape

This is a **pivotal point** for the electricity system. Ontario is entering a period of growing needs – by 2050, electricity demand to grow by 60%.

These needs are being driven by **economic growth, population growth and increased electrification**.

This demand growth is happening in the midst of expiring generator contracts, nuclear refurbishments and the elimination of emissions from the grid.

To meet the emerging needs, **Ontario will require additional new electricity infrastructure**, including new supply and transmission.



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Additional Information

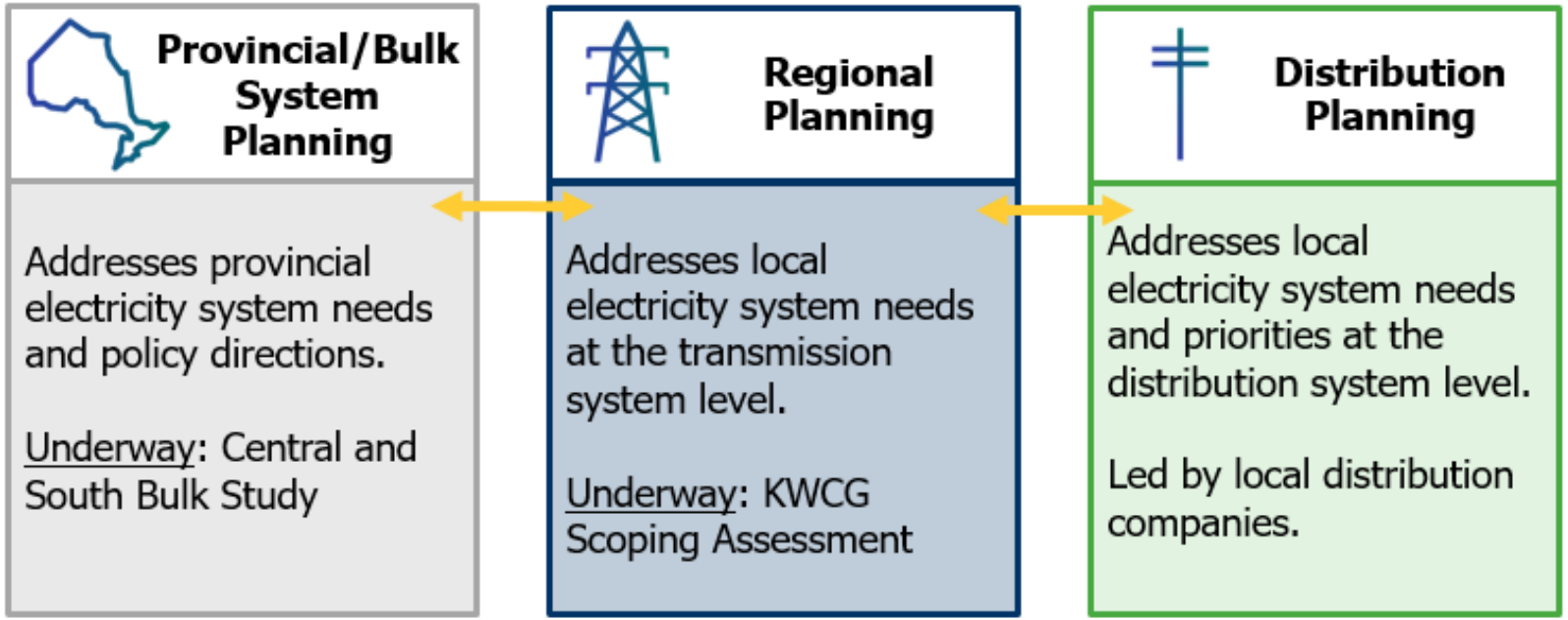
To help inform important decisions, the IESO has a number of resources including:

- LT RFP community engagement webpage
- Resource Adequacy Updates and the May 9, 2024 Resource Adequacy Update
- Frequently asked questions on the procurements

For questions on the long-term procurements, please reach out to communityengagement@ieso.ca

Regional Electricity Planning Process and the Kitchener/Waterloo/Cambridge/Guelph (KWCG) Region

Electricity Planning in Ontario



21 Electricity Regional Planning Regions

The regional system planning process ensures an affordable and reliable supply of electricity across Ontario. The process looks at the unique needs of each region, and considers a range of options and resources to keep the lights on.

A comprehensive planning approach to develop an Integrated Regional Resource Plan (IRRP) is underway for the Kitchener/Waterloo/ Cambridge/Guelph or KWCG electrical region, located in Southwestern Ontario.

Technical Working Group

The regional planning process is conducted by a Technical Working Group. For the Scoping Assessment this consists of:

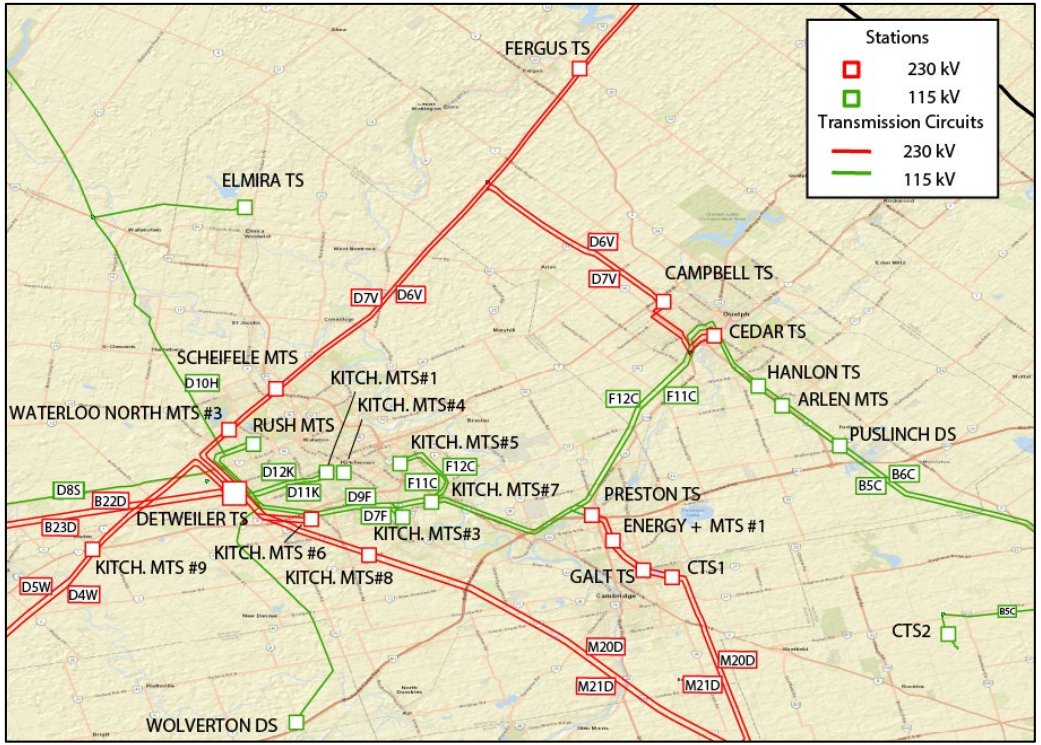
Team Lead, System Operator	• Independent Electricity System Operator
Lead Transmitter	• Hydro One Networks Inc. (Transmission)
Local Distribution Companies	• Alectra Inc. • Centre Wellington • Enova Power Corp. • Grandbridge energy • Halton Hills Hydro Inc. • Hydro One Networks Inc. (Distribution) • Milton Hydro • Wellington North

KWCG Electrical Region

The area is serviced by 230 kilovolt (kV) and 115 kV lines and transformer stations (TS).

The electrical region encompasses the municipalities of Kitchener, Waterloo, Cambridge and Guelph; counties of Perth, Oxford, Wellington; the townships of Wellesley, Woolwich, Wilmot, North Dumfries, and the Region of Waterloo.

The electrical region also encompasses the Métis Nation of Ontario, Grand River Métis Council, Six Nations of the Grand River, Mississaugas of the Credit First Nation, Chiefs of Ontario, Anishinabek Nation and Association of Iroquois and Allied Indians.



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Previous Regional Planning for KWCG

Since 2013, two cycles of planning work have been completed:

- The first cycle of regional planning was completed in December 2015 and recommended conservation and distributed generation to help meet peak demand growth. It also recommended the implementation of Guelph Area Transmission Refurbishment (GATR) that focused on addressing supply needs in the south-central Guelph and Kitchener area, and minimizing the impact of potential supply interruptions to customers in Waterloo, Guelph and surrounding areas.
- The second cycle was completed in May 2021 and recommended monitoring the IESO's Local Initiatives Program to reduce the area's net demand. It also recommended a number of end-of-life refurbishments and some transmission upgrades to help speed up restoring power and postpone the need for new transmission infrastructure.

These solutions ensured a reliable supply of electricity to the area. However, continued demand growth will require the implementation of a new solution.

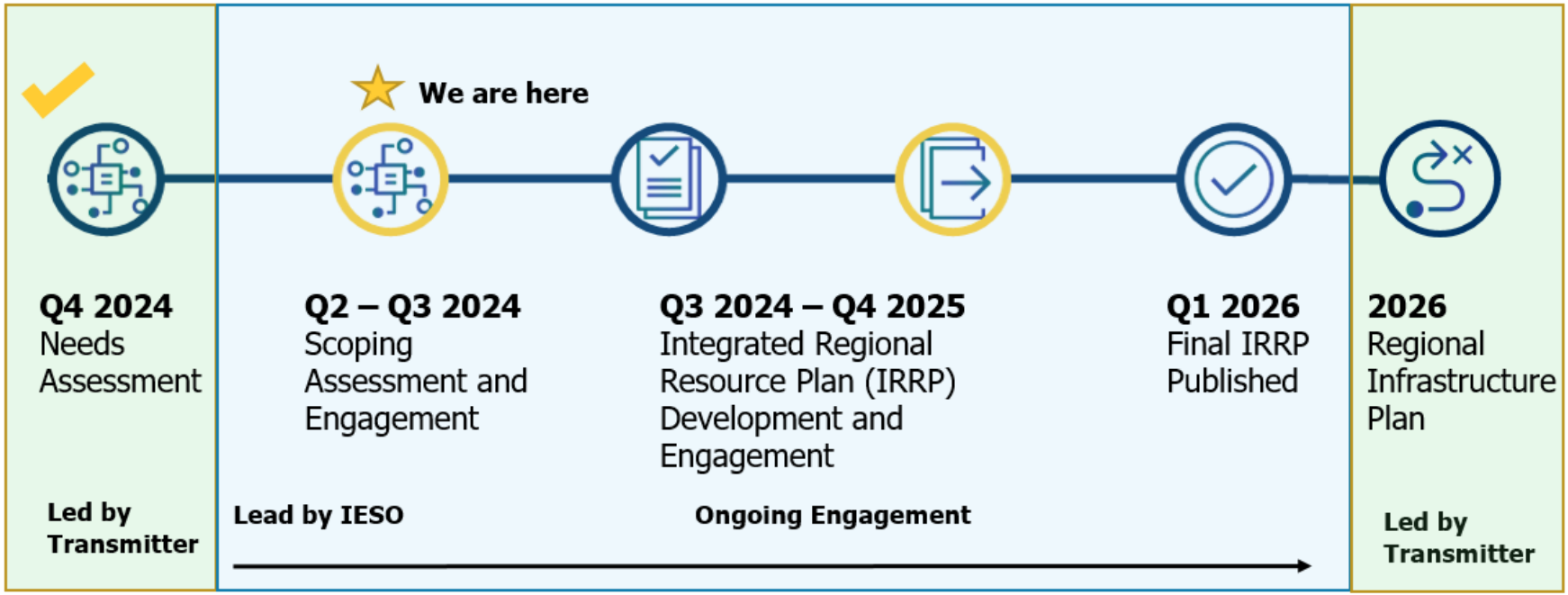
Demand Drivers Identified in KWCG

The Distributors in the Technical Working Group identified the below drivers of demand in the region:

- **Population growth**: Population and accompanying employment are expected to grow steadily
- **Industrial sector changes**: Transitioning from a manufacturing-oriented economy to a diversified and balanced economy.
- **Intensification of downtown Kitchener**: Growing residential and commercial development along LRT route and into Cambridge along expansion route
- **Renewable development and CDM**: Participation in provincial energy programs and CDM programs; Time-of-Use shifting demand and conserving energy

Electricity Demand will be confirmed and additional demand drivers may be identified as the IRRP progresses. For more details, please refer to the draft Scoping Assessment Outcome Report or Hydro One's Needs Assessment Report.

2024 - 2025 KWCG Regional Planning Timeline



*Reflects typical 18-month IRRP timeline. Working Group has the flexibility to extend to 24 months where required.

Seeking Input

Local considerations and feedback are a critical component the planning process. The IESO wants to hear from you:

- What additional information should be considered as part of the Scoping Assessment?
- What other considerations based on local developments should be made regarding the areas identified as requiring further study?
- What other areas or specific considerations should be examined through regional planning?

Please submit your written comments by email to engagement@ieso.ca by July 2, 2024

KWCG Draft Scoping Assessment

What is a Scoping Assessment?

As part of the Scoping Assessment, the Technical Working Group will be determining the best planning approach to meet the electricity needs of KWCG electrical region.

Key Elements:

- Review needs that require comprehensive planning
- Determine the geographic grouping (sub-regions) of needs, if needed
- Determine the appropriate regional planning approach and scope
- Establish the draft Terms of Reference for an Integrated Regional Resource Plan, if one is required, and composition of the Technical Working Group

Needs Identified in KWCG

The Technical Working Group, led by Hydro One recently completed a Needs Assessment process that identified:

- **Station capacity needs**: Ability of a station to deliver power from the grid down to the distribution system.
- **Supply capacity needs**: Ability of the system to supply power through the transmission lines to a local area.
- **Load restoration needs**: Ability of the system to restore power after select contingencies.
- **Asset replacement needs**: Station or transmission equipment has reached end of life.

These needs will be confirmed and additional needs may be identified as the IRRP progresses. For more details, please refer to the draft Scoping Assessment Outcome Report or Hydro One's Needs Assessment Report.

Preliminary Electricity Needs Identified for KWCG (1)

Preliminary electricity needs identified in the Needs Assessment:

Need Type	#	Impacted Equipment	Timing	Considerations
Station Capacity Ability of a station to deliver power from the grid down to the distribution system	1	Preston TS (T3 & T4)	Near-term	Potential large load project may drive need for a new station
	2	Energy+ Inc. MTS (T1 & T2)	Near-term	Proximity to potential new station
	3	Cedar TS (T7 & T8), (T1 & T2)	Near-term, Mid-term	Planned end-of-life replacement
	4	Kitchener MTS #7 (T14 & T13)	Mid-term	Potential for near-term load transfers
	5	Rush MTS (T1 & T2)	Mid-term	Proximity to potential new station
	6	Waterloo North MTS #3 (T1 & T2)	Mid-term	Proximity to potential new station
	7	Campbell TS (T3 & T4)	Mid-term	Load will exceed current capabilities

Preliminary Electricity Needs Identified for KWCG (2)

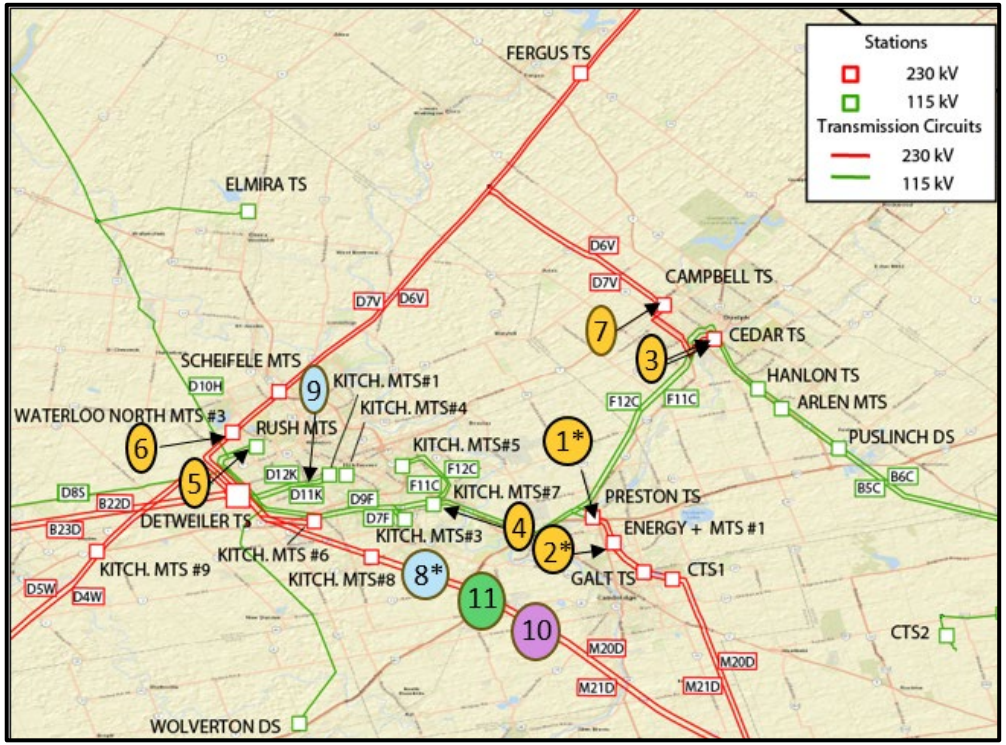
Preliminary Station Capacity needs:

Need Type	#	Impacted Equipment	Timing	Considerations
Supply Capacity Ability of the system to supply power through the transmission lines to a local area.	8	230 kV M20D/M21D: Galt Junction to Cambridge #1 Junction	Near-term	Supplies Kitchener MTS #6, Kitchener MTS #8, Galt TS, Preston TS, Energy+ MTS #1, and a customer CTS
	9	115 kV D11K/D12K: Detweiler to Kitchener #1 & #4	Mid-term	Supplies Kitchener MTS #1 and Kitchener MTS #4
Load Supply Security Maximum amount of power that can be lost during select contingencies.	10	230 kV M20D/M21D Circuit	Mid-term	Interrelated with capacity needs 1, 2, 8 and 11
Load Restoration Ability of the system to restore power after select contingencies.	11	230 kV M20D/M21D Circuit	Near-term	Interrelated with capacity needs 1, 2, 8 and 10

Geographic Location of Identified Needs

Legend

- Station Capacity Needs
- Supply Capacity Needs
- Load Supply Security
- Load Restoration
- * Pressing Needs



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Scoping Assessment Recommendations

- The preliminary needs identified touch on transmission infrastructure that impact both the bulk and distribution systems. These needs have opportunities for diverse types of solutions involving both wires and non-wires options.
- Capacity needs at Preston TS, Energy+ MT1 #1 and supply capacity need along the Galt JCT to Cambridge section of M20D/M21D are the most pressing. This may introduce the need to use a hand-off letter to allow an expedited initiation of projects to address the imminent needs.
- Distributors unaffected by the regional needs may choose to not actively participate in the Technical Working Group, but will be engaged if future needs or solutions impact their infrastructure or customers.
- Therefore, the electricity needs in the KWCG Region should be looked at in a coordinated manner through a regional electricity plan – Integrated Regional Resource Plan (IRRP).
- This information is available for review in the draft Scoping Assessment and Terms of Reference, which can be found on the KWCG engagement webpage.

Background: Determining Options

Over the course of the planning process, the IESO will…

- **Evaluate various wire and non-wire options**, to address the region's near, medium and long-term electricity needs including:
  -  Traditional wires option to supply local area
  -  Non-wires alternatives, such as distributed generation, conservation & demand management, demand response or transmission connected generation facilities*
- **Seek community feedback** to enhance development and evaluation of options before making a final recommendation.

*More information regarding screening NWAs can be found in the IESO's Guide to Assessing NWAs.

Engagement and Next Steps

Ongoing Engagement

Your input plays an important role in developing the electricity plan.

Participate in upcoming public webinars

Subscribe to receive updates on the IESO website by selecting the Kitchener/Waterloo/Cambridge/Guelph Region

Follow the Kitchener/Waterloo/Cambridge/Guelph regional planning activities online

Next Steps

The IESO will continue to engage and inform municipalities throughout the IRRP's development. Communities can expect to hear from the IESO at these milestones:

Q3 2024: Feedback and response to feedback posted; Final Scoping Assessment

Q1 2025: Demand forecast presented in a public engagement webinar

Q3 2025: Needs and potential options presented in a public engagement webinar

Q4 2025: Options analysis and draft recommendations are presented in a public engagement webinar with an opportunity to provide feedback

Q1 2026: IRRP report will be completed and published on the engagement webpage

Seeking Input

Local considerations and feedback are a critical component the planning process. The IESO wants to hear from you:

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Please submit your written comments by email to engagement@ieso.ca by July 2, 2024

Thank You

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Appendix

Identifying the Planning Approach

Approach	Typical Considerations	Parties Involved
Integrated Regional Resource Plan (IRRP)	Where a greater range of options, including non-wires, are to be considered, and/or closer coordination with communities and stakeholders is required	IESO (lead) Transmitter LDCs
Regional Infrastructure Plan (RIP)	Considers more straight-forward wires-only options with limited engagement	Transmitter (lead) LDCs IESO
Local Planning	No further regional coordination is needed	Transmitter LDCs

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

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

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