# Renfrew Region
# 2021-2022 Integrated Regional Resource Plan (IRRP)

## Engagement Webinar #3

**November 1 2022**

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# Purpose & Agenda

## Purpose

- To provide an update on the development of an electricity plan – Integrated Regional Resource Plan (IRRP) – for Renfrew Region
- To provide an overview and seek input on recommended solutions

## Agenda

- Electricity Plan Status Update
- Recap of Needs and Potential Solutions
- Options Analysis and Draft Recommendations
- Next Steps

# Seeking Input

## As you listen today, please consider the following questions to guide your feedback on the draft recommended plan for Renfrew Region:

- What feedback is there to the proposed recommendations?
- What information needs to be considered in these recommendations?
- How can the IESO continue to engage with communities and stakeholders as these recommendations are implemented, or to help prepare for the next planning cycle?

**Please submit your written comments by email to engagement@ieso.ca by November 22**

# IRRP Status Update

# IRRP Status Update - Timeline

- IRRP began in Q3 2021, and is on track for completion by Q4 2022
  - Electricity demand forecast, issues, and options have been determined and recommendations are being presented
  - The next steps are to seek feedback and complete the final report

| Q2 2021 | Q3 2021 | Q3 2021 | ... | Q3 2022 | Q4 2022 |
|---|---|---|---|---|---|
| Needs Assessment | Scoping Assessment and Engagement | IRRP Study and Engagement | | | IRRP Published |

# Regional Planning Activities to Date

- Final Scoping Assessment posted – Aug 13, 2021
- Initiated IRRP Process – Sept 8, 2021
- Public Webinar #1 on this region's forecast, issues, and engagement – February 9, 2022
- Public Webinar #2 on the finalized forecast and identified options – July 26 2022
- Engagement Process with local communities and stakeholders – Q1-Q2 2022
- Technical Working Group Meetings to develop demand forecast, assess issues, and determine options – Q3 2021 to Q3 2022

# What we've heard so far…

- Rural and urban communities across the region are experiencing unprecedented growth caused by people moving away from cities
- Communities experiencing accelerated demand for housing, many communities have ample land to meet demand
- Identified two areas with potential large scale increases in electricity demand that required the development of new growth scenarios
- Interest in the types of non-wires alternatives being considered as part of this regional plan

# Demand Forecast and Transmission System Issues

# Categories of Regional Planning Issues

## Capacity Needs

- Station capacity needs - refers to the ability to convert power from the transmission system down to distribution system voltages
- Local system supply 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

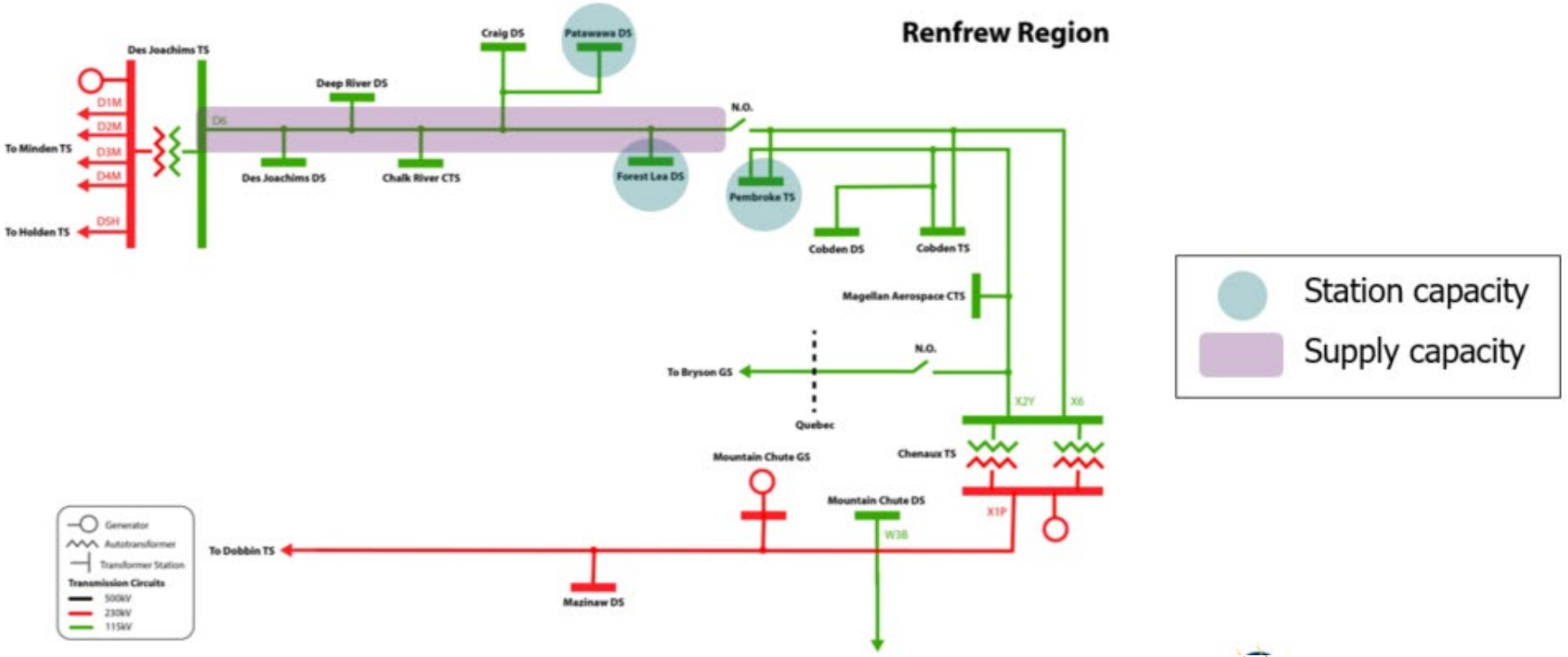
- Based on the best available asset condition information at the time
- Evaluated to decide if the facility should be replaced "like-for-like", "right-sized", or retired

# Transmission System Issues - Summary

- Three station capacity issues and one upstream transmission system issue have been identified for the region
- Upstream transmission system supply issues only appear in the high growth scenarios for the Des Joachims Sub-system

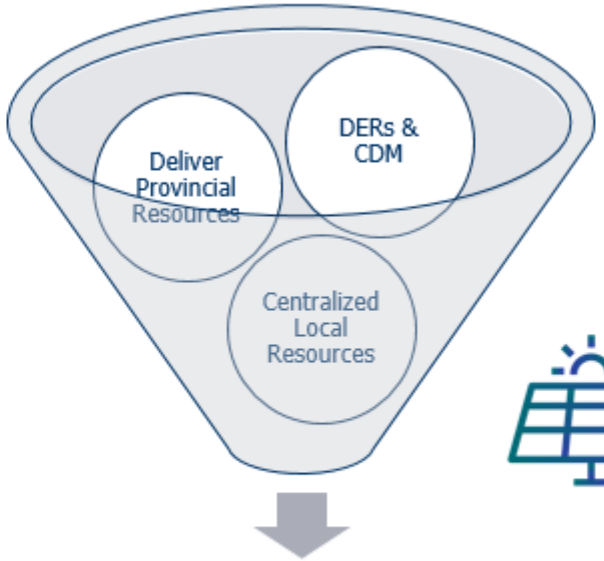
| | Issues | Location | Timeframe |
|---|---|---|---|
| 1 | Station Capacity | Pembroke TS | Today |
| 2 | Station Capacity | Forest Lea DS | Today |
| 3 | Station Capacity | Petawawa DS | Mid term |
| 4 | Local Area Transmission | 115 kV Des Joachims side | Long term |

# Single Line Diagram of Renfrew Electrical System



# Recap: Possible Options in Electricity Planning

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

Recommendations

# Non-Wires Alternatives Considered

**Potential NWAs were identified, screened, and evaluated based on technical feasibility and cost:**

- Generation – single cycle gas turbine (SCGT)
- Energy efficiency (EE) (also referred to as CDM)
- Energy storage
- A combination of generation and EE, or storage and EE

# Options Analysis and Draft Recommendations

# Options Analysis and Recommended Solutions (1)

- Issue: Forest Lea DS station capacity

| Options | Draft Recommended Solutions |
|---|---|
| Transmission Options<br>• 2MW distribution load transfer to Craig TS ($50k)<br>• 4MW station upgrade of transformer fan cooling and SCADA ($0.6M)<br>Non-Wires Option<br>• Demand response for 1 MW in east zone ($0.95M)<br>• Storage in the form of 1MW capacity and 4 hour battery life ($1.6M) | **Near-term load transfer is recommended, this meets the need and is the most cost effective solution. Additional station reinforcements (fan cooling + SCADA) to be pursued if required.** |

| 2042 | |
|---|---|
| **Summer Capacity Need:** | **1MW** |
| **Winter Capacity Need:** | **0.1MW** |

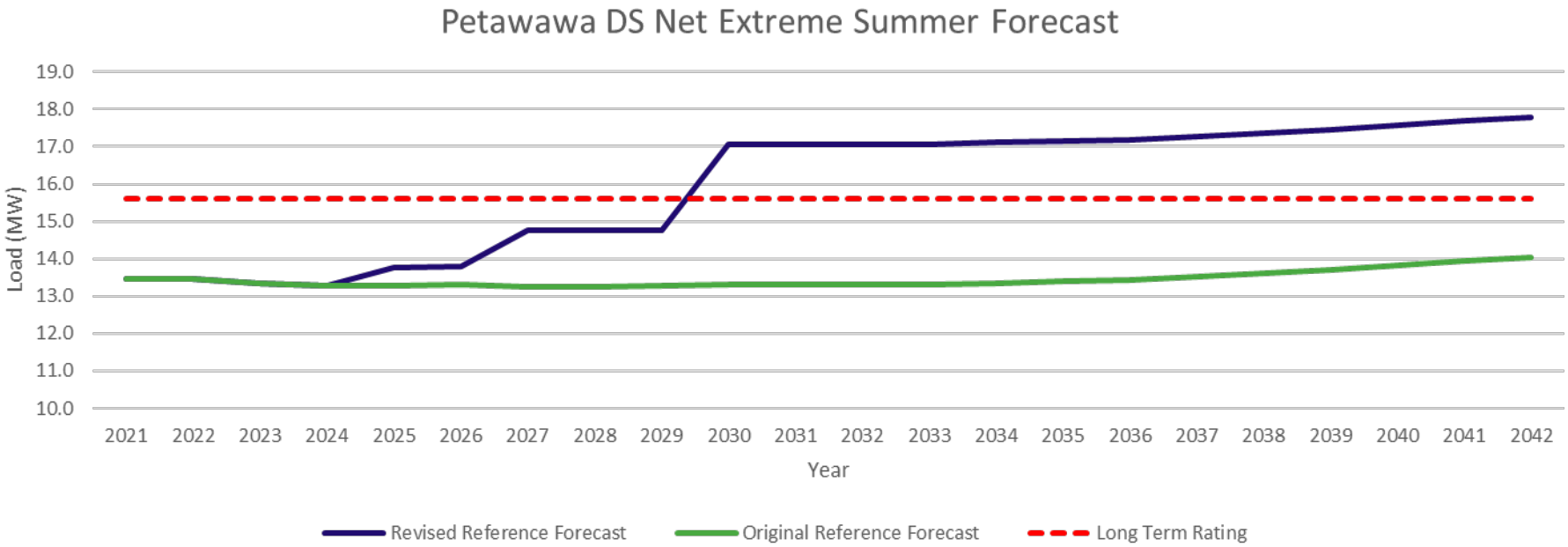
# Options Analysis and Recommended Solutions (2)

- Issue: Petawawa DS station capacity

| Options | Draft Recommended Solutions |
|---|---|
| <u>Transmission Options</u><br>1. Upgrade transformers at existing DS ($6M) adds 3MW<br>2. Build new HVDS station ($12M) adds 18MW<br><u>Non-Wires Option</u><br>• Generation: considers a SCGT facility for 2 MW need, ($13M) | **Monitoring the load growth and building a new HVDS in the mid-term is recommended.**<br><br>An HVDS is preferable as it provides more capacity which will help meet electrification expected to arise in the mid-term. |

| **2042** | |
|---|---|
| **Summer Capacity Need:** | **2.2MW** |
| **Winter Capacity Need:** | **0MW** |

# Options Analysis and Recommended Solutions (2)




During engagement with CFB Petawawa the base informed the working group of additional forecasted growth which was considered by Hydro One Distribution and incorporated in the revised forecast

# Options Analysis – Background HVDS

- Convert the existing Pembroke Distribution Station (DS) into a High Voltage Distribution Station (HVDS)
- Build two new feeders from the HVDS to supply 10MW of existing Ottawa River Power Corp (ORPC) load
- 4MW of remaining capacity between Pembroke TS and new HVDS

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# Options Analysis – Background TS

- Build new Pembroke Transformer Station (TS) near existing station
- Transfer 12MW of existing Hydro One Distribution load to new TS
- 4MW of remaining capacity on Pembroke TS, 20MW of remaining useable capacity on TS 2




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# Options Analysis and Recommended Solutions (3)

- Issue: Pembroke TS station capacity

| Options | Draft Recommended Solutions |
|---|---|
| Transmission Options<br>**1. Build new High Voltage Distribution Station ($14M)**<br>• Convert existing Pembroke DS to HVDS<br>• Supply Ottawa River Power Corp with 2 12kV feeders<br>• 2MW of remaining capacity on each TS 1 and HVDS<br>**2. Build new Transformer Station ($28M)**<br>• 20MW[1] of remaining capacity at TS 2, 4MW at TS 1<br>• Ottawa River Power Corp to maintain current dist. system<br><br>Non-Wires Option<br>• Generation: considers an SCGT facility for 16 MW need ($46M)<br>• Storage: Need would require 16 MW storage capacity and with 10.3 hours of storage need. ($96M) | **Building a new Transformer Station near the existing Pembroke TS is recommended.**<br><br>Building an HVDS would cost approximately $14M and would meet the long term load forecast with 4MW of total capacity remaining between the two stations. This comes at a reduced reliability compared to a TS which costs approximately $28M and will have 20MW[1] of remaining useable capacity to accommodate future growth and leaves 4MW of capacity at Pembroke TS 1. Compared to NWA options of generation and storage there is a cost savings for wires ranging from $18M-$82M. |

[1]Actual remaining capacity at new TS is 28MW but is limited to 20MW due to upstream transmission constraints

# Options Analysis and Recommended Solutions (3)

**Benefits of TS compared to HVDS**

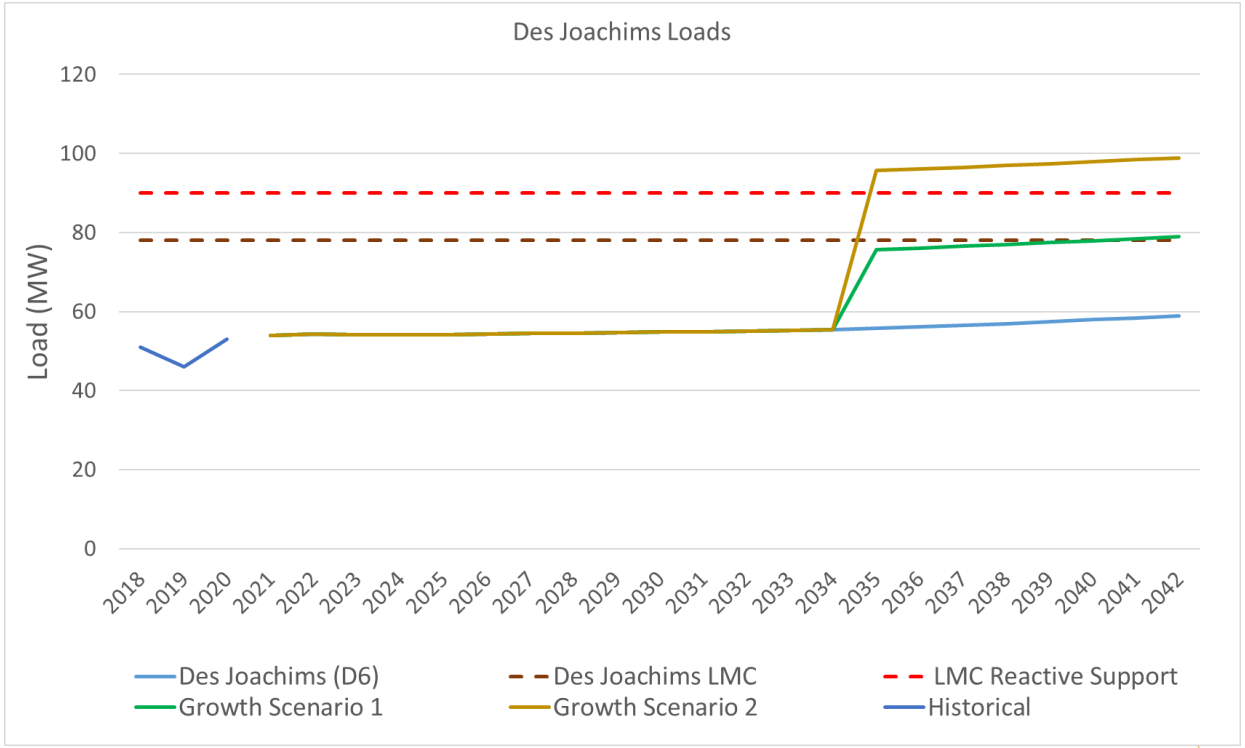
- Allows ORPC to continue to maintain and grow their distribution system under existing strategy, HVDS would put 10MW of ORPC on radial 12kV feeders
- Maintains same quality of service reliability, HVDS reduces reliability as the station is single supply as opposed to double supply
- Leaves 24MW of remaining capacity available at Pembroke TS 1 and new TS in case of electrification or unexpected customer connection, HVDS and TS 1 would each only have 2MW of capacity left leaving less room for growth over 20 year forecast period

# Options Analysis and Recommended Solutions (4)

- Issue: Des Joachims sub-system Load Meeting Capability (LMC) exceeded in high growth scenarios

| Options | Draft Recommended Solutions |
|---|---|
| 1. Install new shunt capacitor on D6<br>2. Build a new transmission line parallel to D6<br>• The Des Joachims sub-system LMC is 80MW limited by voltage decline at line-end stations<br>• Reactive support in the form of shunt capacitors improves the limit to 90MW<br>• This new limit is adequate for growth scenario 1 but is exceeded under growth scenario 2<br>• In this event a new transmission line would need to be built | **It is recommended that the regional planning working group continues to monitor the load growth in the area and triggers planning of the new capacitor and/or transmission line when required.** |

# Options Analysis and Recommended Solutions (4)



# Next Steps

# Next Steps

- Written feedback will be collected up until **November 22**
- Final plan to be published by the end of the year
- Further discussions with local municipalities, customers, and stakeholders as necessary

# Keeping in Touch

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

# Seeking Input

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# 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

# Thank You

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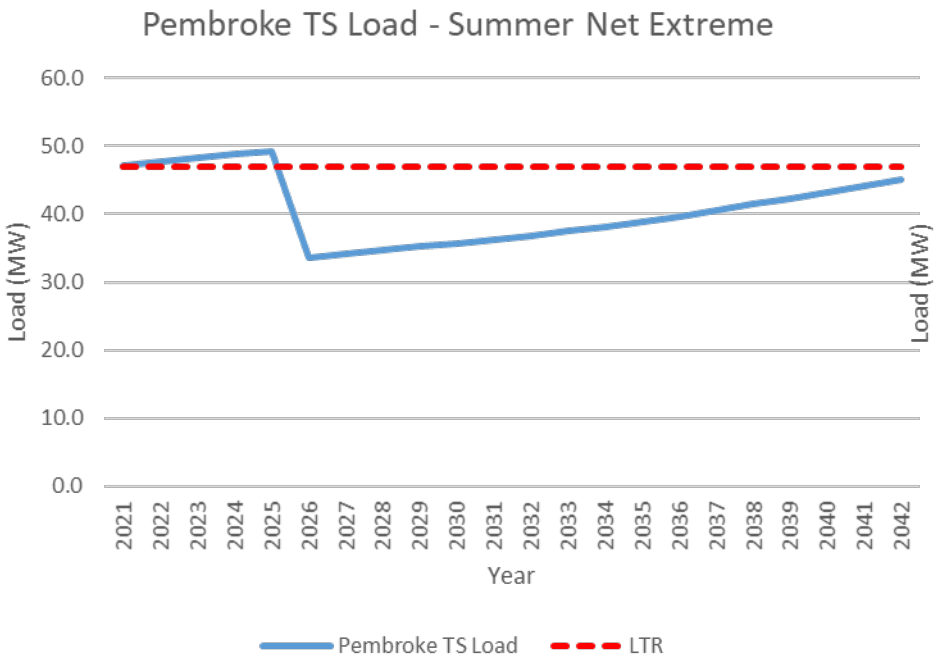
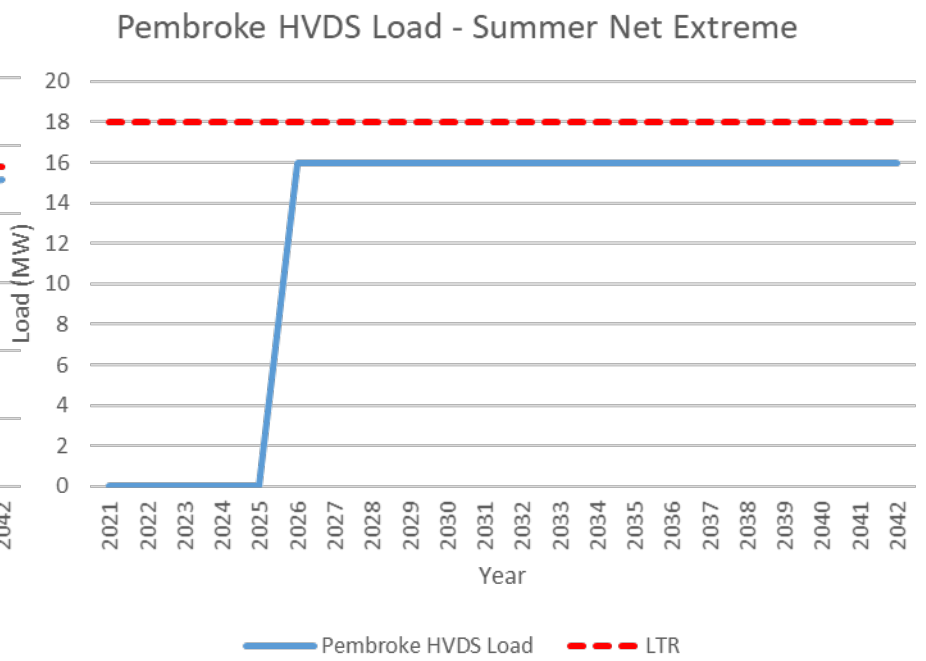
# Appendix

# List of Abbreviations

- HVDS: High Voltage Distribution Station
- TS: Transformer Station
- DS: Distribution Station
- NWA: Non-Wires Alternative
- LMC: Load Meeting Capability
- HONI: Hydro One Networks Inc.
- ORPC: Ottawa River Power Corp.

# Station Capacity HVDS Option



# Station Capacity TS Option