

1 Q. Re: CBA, Rev. 1, vol. II, Wabush Substation Upgrades, page 3 (p. 549 pdf)

2 Citation:

3 The substation has a total installed capacity (at 25°C ambient) of 37.3 MVA. The
4 firm transformation capacity of the substation is 20.6 MVA. Load forecasts
5 indicate that the peak demand for the Wabush Substation is expected to reach
6 22.3 MW by the winter of 2021. The substation’s firm capacity has already been
7 exceeded by approximately 10% and load forecasts predict that peak loads will
8 increase. There is therefore a violation to Transmission Planning Criteria as
9 there is insufficient power transformer capacity to meet peak load Additional
10 details of the load forecast are provided in Section 2.2 of Attachment 1.

- 11 a. Please confirm that the cited value for firm transformation capacity of the substation of 20.6
12 MVA is based on NLSO ratings, whereas it was 25.5 MW under the Distribution Planning
13 criteria previously in place.
- 14 b. Please provide P50 and P90 load forecasts for the Wabush Substation for the 25-year
15 planning period, and explain how they were derived, updating those presented in the 2018.
- 16 c. Have any changes in the analysis of alternatives been made since the 2018 TES, other than
17 updating cost information? If so, please elaborate.

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20 A.

- 21 a. It is confirmed that the firm transformation capacity of Wabush Substation is 20.6 MVA
22 based on Transmission Planning Criteria, whereas it was previously 25.5 MVA based on
23 Distribution Planning Criteria. As per Newfoundland and Labrador Hydro’s (“Hydro”)
24 response to PUB-NLH-035 of this proceeding, the application of Distribution Planning
25 Criteria to terminal station power transformers is not appropriate.

1 **b.** Please refer to Attachment 1 of the Additions for Load – Wabush Substation Upgrades
2 project report¹ which provides the 25-year P50 and P90 peak demand forecasts for the
3 Wabush Substation that was prepared in 2019 for the study.

4 P50 demand for the Wabush Substation is forecast for an initial six-year period based on
5 annually updated six-year forecast of Wabush Substation system energy requirements and
6 applying an average historical Wabush Substation system load factor to derive a forecast of
7 peak demand. Any approved new and significant data centre/cryptocurrency demand is
8 forecast separately and added to the Wabush Substation demand forecast.

9 For the forecast prepared in 2019, beyond the initial six-year period and up to year 2041–
10 2042, forecast demand for the Wabush Substation reflects a fixed share of the combined
11 Wabush–Labrador City regional load requirements forecast that relies on a similar
12 application of average historical load factor applied to the regional energy requirement
13 forecast to derive a forecast of demand requirements. Note that Hydro’s rural systems
14 energy forecasts are derived via a combination of historical trend analyses and load
15 forecaster judgement. The forecast prepared in 2019 was extended from 2041–2042 by
16 adding the five-year (2037–2041) average incremental annual increase of 30 kW.

17 The P90 demand increment for the Wabush Substation, which is estimated at 480 kW,
18 represents a share of the overall P90 incremental demand estimate for Labrador West retail
19 load. The incremental P90 demand estimate was prepared by Daymark Energy Advisors, a
20 consultancy located in Massachusetts, USA.

21 Table 1 provides the six-year P50 load forecast for the Wabush Substation that was
22 prepared in spring 2020.² Changes in forecast peak demand from spring 2019 generally
23 reflect a modest reduction in forecast data centre/cryptocurrency load and a modest
24 increase in forecast residential and general service loads that is anticipated from the
25 successful restart of iron ore operations by Tacora Resources. At spring 2020, the estimated

¹ “2021 Capital Budget Application,” Newfoundland and Labrador Hydro, rev 1, August 7, 2020 (originally filed August 4, 2020), vol II, tab 16, att. 1, at p. 4, table 2.

² Hydro annually prepares a six-year load forecast for the individual Wabush and Labrador City systems and a longer term load forecast for the combined community requirement.

1 P90 demand load increment for the Wabush Substation is estimated at 480 kW and remains
2 unchanged from the Daymark Energy Advisors estimate.

Table 1: Six-Year P50 Load Forecast - Town of Wabush (Wabush Substation)

Year	P50 Peak (kW)
2020–2021	22,607
2021–2022	22,913
2022–2023	23,010
2023–2024	23,179
2024–2025	23,348
2025–2026	23,516

3 c. The analysis of the Wabush Substation Upgrade - Three Transformer Configuration
4 alternative was revised on the basis of distribution voltage regulation requirements that
5 were identified as part of the engineering design process. Specifically, it was determined
6 that there is a requirement for the proposed bus tie circuit breaker to remain in a normally
7 closed position with the proposed new power transformer supplying and providing voltage
8 regulation for station loads with its on-load tap changer.³

9 Forecasts were updated as part of the revised analysis and it was determined that a power
10 transformer with a rating of 20/26.7 MVA should be specified to meet the peak forecasted
11 load of 24.4 MVA.

³ Power transformers T4 and T6 would remain in service as hot spares with open disconnect switches.