

1 Q. **Reference: Labrador Expansion Study, pp. (23-24 and 31 (pp. 31-32 and p. 39 pdf);**  
2 **Network Addition Policy, page 8 (pdf)**

3 Citation 1 (pp. 23-24, Expansion Study):

4  
5 5.2 Long-Term Supply to Labrador West

6  
7 5.2.1 Transmission System Capacity Upgrades

8  
9 The analysis provided in Appendix B includes a description of the system  
10 additions that would be required to increase transmission system capacity in  
11 western Labrador to meet the peak baseline forecast of 383 MW.

12  
13 The upgrades include the commissioning of the third synchronous condenser at  
14 Wabush Terminal Station,<sup>23</sup> the installation of an additional 23 MVAR of shunt  
15 compensation, and replacement of transformers T4 and T5 with 125 MVA units.  
16 These upgrade will increase system capacity to meet the baseline peak load  
17 forecast of 383 MW.

18  
19 The estimated capital cost of this project is approximated 1 to be \$15.0 million.<sup>24</sup>  
20

21 Citation 2 (Transmission Expansion Study, page 31)

22 7.2 Labrador West

23  
24 The existing 230 kV transmission system has a non-firm winter capacity of 350  
25 MW and is adequate only if supply to industrial customers is restricted. System  
26 additions that would be required to meet the unrestricted baseline load forecast  
27 of 383 MW are described in 5.2.1. Hydro has conducted further analysis to  
28 determine the least-cost options incremental loading scenarios given a significant  
29 potential for incremental load in Labrador West. This comprehensive analysis is  
30 provided in Appendix B. Table 11 provides a summary of the preferred  
31 alternatives.

Table 11: Preferred Alternative for Incremental Lab West Load Levels

Lab West Load (MW)	Least-Cost Option	Description of Alternative	Capital Cost (\$ million)
> 383	Alternative 5	<ul style="list-style-type: none"> <li>Commissioning of SC3</li> <li>Replacement of T4, T5, and T6 with 125 MVA units for loss of largest transformer</li> <li>Replacement of four, 46 kV circuit breakers due to exceeding fault level</li> <li>Installation of 72 MVARs of reactive compensation (needed for loss of SC#3)</li> <li>Thermal Upgrade of L23/L24 to 75°C conductor temperature</li> </ul>	31.66
> 434	Alternative 17	<ul style="list-style-type: none"> <li>Construction of 50 km of 315 kV transmission line from Bloom Lake, ("BLK") to Flora Lake ("FLK") and 5 km of 230 kV from FLK to WAB.</li> <li>BLK 315 kV and WAB 230 kV Line Terminations</li> <li>Construction of new 315/230/46 kV terminal station at FLK</li> <li>Installation of four 40.2 MVAR capacitor banks on FLK 230 kV Bus</li> <li>Commission synchronous condenser SC3</li> <li>Upgrade of 14, 46 kV breakers with 2000 A, 31.5 kA breakers</li> <li>25 km of new 46 kV distribution lines plus upgrades to existing distribution lines</li> </ul>	153.15

1 Citation 3 (Network Addition Policy)

Table 1  
Derivation of Expansion Costs per kW

Region	Capacity kW	Description	2019 Capital Investment (\$000)	Direct Investment \$ per kW
Labrador East	21,000	Transformer Upgrades at HV-GB	5,000	238
	37,000	Transformer Upgrades at HV-GB and MF Terminal Station	15,000	405
	100,000	Construct second line from MF to HV-GB	50,000	500
Labrador West	33,000	Wabush TS Upgrades and 230 kV uprating	16,500	500
<b>Sub-Total</b>	<b>191,000</b>		<b>86,500</b>	<b>453</b>
		O&M <sup>9</sup>		12
<b>Total</b>				<b>465</b>

- 1 a) Please confirm that the single expansion project identified for Labrador West in the  
2 Network Addition Policy (Citation 3) is identical to the one identified in the citation from  
3 the Transmission Expansion Study (Citation 1).  
4
- 5 b) Please explain why the two projects identified in Table 11 of the Transmission  
6 Expansion Study, required if Lab West loads increase beyond 383 MW, were not included in  
7 the derivation of expansion costs in the Network Addition Policy (Citation 3).  
8  
9
- 10 A. a) It is not confirmed. Citation 1 refers to Alternative 4 and Citation 2 provides Alternative  
11 5. Table 1 referenced in Citation 3 refers to the incremental cost and incremental capacity  
12 of Alternative 5 compared to Alternative 4. Please see Part b).  
13
- 14 b) As explained in Newfoundland and Labrador Hydro's ("Hydro") response to LAB-NLH-  
15 090, projects required to serve the baseline forecast were not included in the derivation of  
16 the Expansion Cost per kW. This includes Alternative 4. Alternative 4 was forecast to cost  
17 \$15.12 million. However, several of the project elements in Alternative 5 (forecast to cost  
18 \$31.66 million) described in Table 11 are also included in Alternative 4 which was included  
19 as a project to serve the baseline forecast.  
20
- 21 Therefore, to isolate the incremental cost per kW of Alternative 5 for use in computing the  
22 Expansion Cost per kW provided in Table 1, Hydro isolated the incremental cost and  
23 incremental capacity provided by Alternative 5 compared to Alternative 4. Table 1, which  
24 provides the derivation of the Expansion Cost per kW, shows the \$16.5 million incremental  
25 cost and the 33 MW incremental capacity (454 MW less 421 MW<sup>1</sup>) of Alternative 5  
26 compared to Alternative 4.

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<sup>1</sup> "Labrador Interconnected System Transmission Expansion Study," App. B, at p. 14, Table 4 showed a non-firm capacity of 387 MW with Alternative 4; the non-firm capacity should have been stated as 421 MW.

- 1 Please refer to Hydro's response to LAB-NLH-090 Part a) for the explanation of why
- 2 Alternative 17 was not included in the derivation of the Expansion Cost per kW provided in
- 3 Table 1.