Q. **Reference: Transmission Expansion Study, Appendix B, Appendix A ("Labrador West Future Transmission Supply Alternatives"); Labrador Expansion Study, p. 32 (p. 40 pdf)**

a) Please indicate which of the alternatives presented in response to the previous question involve a new interconnection with Hydro-Québec;

b) Please provide and explain Hydro's estimates of the costs involved in this approach, broken down into:

i) Hydro's own capital investments;

ii) Hydro-Québec's direct investments in construction a required post and lines;

iii) Hydro-Québec's upstream transmission upgrades required to provide the required service; and

iv) The ongoing transmission tariff expenses flowing from using point-to-point service for either export or wheel-through service under Hydro-Québec's open access transmission tariff.

A. a) The alternatives presented in the table provided in Newfoundland and Labrador Hydro's ("Hydro") response to LAB-NLH-094 that involve a new interconnection with Hydro-Québec are Alternatives 8, 9, 11, 12, 13, 14, and 17.

b) For all alternatives, Hydro-Québec's required upstream transmission upgrades and transmission tariffs have not been determined. These parameters would be determined as part of the System Impact Study process with Hydro Québec. Table 1 to Table 7 include cost information for each alternative involving a Hydro-Québec interconnection. All capital investment estimates for Hydro and Hydro-Québec were developed internally.

Table 1: Alternative 8

Proposed Capital Investment	Description	Cost ($ million)
Hydro Capital	5 km of 230 kV transmission line from Flora Lake Terminal Station ("FLKTS") to Wabush Terminal Station ("WTS")	5.31
	WTS line termination costs (breakers, disconnects, dead end)	1.66
	Construction of new 315/230 kV terminal station at Flora Lake	34.80
	Installation of 3, 24.3 MVAr capacitor banks at FLKTS	5.11
	Fully commission Synchronous Condenser #3 ("SC3") at WTS	0.50
	Replace WTS transformers T4, T5, T6, with 125 MVA units	15.63
	Upgrade of 15, 46 kV circuit breakers at WTS	4.28
	Upgrade of 46 kV distribution lines L32, 33, 36, and 40	1.82
Hydro-Québec	50 km of 315 kV transmission line from Bloom Lake Terminal Station ("BLKTS") to FLKTS	69.38
	BLKTS line termination costs (breakers, disconnects, dead end)	2.90

Table 2: Alternative 9

Proposed Capital Investment	Description	Cost ($ million)
Hydro Capital	5 km of 230 kV transmission line from FLKTS to WTS	5.31
	WTS line termination costs (breakers, disconnects, dead end)	1.66
	Construction of new 315/230/46 kV terminal station at Flora Lake	50.40
	Installation of 3, 24.3 MVAr capacitor banks at FLKTS	5.11
	Fully commission Synchronous Condenser #3 ("SC3") at WTS	0.50
	Upgrade of 14, 46 kV circuit breakers at WTS	4.00
	Construction of 25 km of new 46 kV distribution lines and upgrades to existing distribution lines	7.72
Hydro-Québec	50 km of 315 kV transmission line from BLKTS to FLKTS	69.38
	BLKTS line termination costs (breakers, disconnects, dead end)	2.90

Table 3: Alternative 11

Proposed Capital Investment	Description	Cost ($ million)
Hydro Capital	210 km of 315 kV transmission line from Churchill Falls Terminal Station ("CFTS") to FLKTS	256.45
	CFTS line termination costs (breakers, disconnects, dead end)	2.00
	5 km of 230 kV transmission line from FLKTS to WTS	5.31
	WTS line termination costs (breakers, disconnects, dead end)	1.66
	Construction of new 315/230/46 kV terminal station at Flora Lake	49.20
	Fully commission Synchronous Condenser #3 ("SC3") at WTS	0.50
	Upgrade of 10, 46 kV circuit breakers at WTS	2.85
	Construction of 25 km of new 46 kV distribution lines and upgrades to existing distribution lines	7.72
Hydro-Québec	50 km of 315 kV transmission line from BLKTS to FLKTS	69.38
	BLKTS line termination costs (breakers, disconnects, dead end)	2.90

Table 4: Alternative 12

Proposed Capital Investment	Description	Cost ($ million)
Hydro Capital	5 km of 230 kV transmission line from FLKTS to WTS	5.31
	WTS line termination costs (breakers, disconnects, dead end)	1.66
	Construction of FLK converter building complete with 60 MVAr filter bank	107.00
	Construction of new 230/46 kV terminal station at Flora Lake	25.50
	Fully commission Synchronous Condenser #3 ("SC3") at WTS	0.50
	Upgrade of 4, 46 kV circuit breakers at WTS	1.14
	Construction of 25 km of new 46 kV distribution lines and upgrades to existing distribution lines	7.72
Hydro-Québec	50 km of 200 kV Monopole HVdc transmission line from BLKTS to FLKTS	89.17
	BLKTS 315 kV line termination costs to BLK converter station (breakers, disconnects, dead end)	2.90
	Construction of BLK converter building complete with 60 MVAr filter bank	107.00

Table 5: Alternative 13

Proposed Capital Investment	Description	Cost ($ million)
Hydro Capital	5 km of 230 kV transmission line from FLKTS to WTS	5.31
	WTS line termination costs (breakers, disconnects, dead end)	1.66
	Construction of new 230/46 kV terminal station at Flora Lake	25.50
	Installation of one 29 MVAr capacitor bank at FLK	2.03
	Fully commission Synchronous Condenser #3 ("SC3") at WTS	0.50
	Upgrade of 10, 46 kV circuit breakers at WTS	2.85
	Construction of 25 km of new 46 kV distribution lines and upgrades to existing distribution lines	7.72
Hydro-Québec	50 km of 230 kV ac transmission line from BLKTS to FLKTS	53.09
	BLKTS 315 kV line termination costs to BLK converter station (breakers, disconnects, dead end) and 230 kV line terminations	4.50
	Construction of BLK HVdc – VSC[1] Back-to-Back Converter building rated at 300 MW	130.00

Table 6: Alternative 14

Proposed Capital Investment	Description	Cost ($ million)
Hydro Capital	WTS line termination costs (breakers, disconnects, dead end)	1.66
	Installation of one 19 MVAr capacitor bank at WTS	1.33
	Fully commission Synchronous Condenser #3 ("SC3") at WTS	0.50
	Replace WTS transformers T4, T5, and T6 with 125 MVA units	15.63
	Upgrade of 10, 46 kV circuit breakers at WTS	2.85
	Upgrade of 46 kV distribution lines L32, 33, 36, 40	1.82
Hydro-Québec	55 km of 230 kV ac transmission line from BLKTS to WTS	58.40
	BLKTS 315 kV line termination costs to BLK converter station (breakers, disconnects, dead end) and 230 kV line terminations	4.50
	Construction of BLK HVdc – VSC Back-to-Back Converter building rated at 300 MW	130.00

[1] Voltage Source Converter ("VSC").

Table 7: Alternative 17

Proposed Capital Investment	Description	Cost ($ million)
Hydro Capital	5 km of 230 kV transmission line from FLKTS to WTS	5.31
	WTS line termination costs (breakers, disconnects, dead end)	1.66
	Construction of new 315/230/46 kV terminal station at Flora Lake	50.40
	Installation of 4, 40.25 MVAr capacitor banks at FLKTS	11.27
	Fully commission Synchronous Condenser #3 (“SC3”) at WTS	0.50
	Upgrade of 14, 46 kV circuit breakers at WTS	4.00
	Construction of 25 km of new 46 kV distribution lines and upgrades to existing distribution lines	7.72
Hydro-Québec	50 km of 315 kV transmission line from BLKTS to FLKTS	69.38
	BLKTS line termination costs (breakers, disconnects, dead end)	2.90