Q. Show the initial capital expenditure and the annualized cost, and the corresponding reduction in the rural deficit under the following scenarios:

a) Interconnection to the Labrador grid of Nain, Davis Inlet, Hopedale, Postville and Makkovik;
b) Interconnection to the Labrador grid of Rigolet, Cartwright, Black Tickle, Paradise River, Norman Bay, Charlottetown, Williams Harbour, Port Hope Simpson, St. Lewis, Mary's Harbour and L'Anse au Loop (show L'Anse au loop separately); and
c) Interconnection to the Island Grid all Isolated Island Systems.

A. Hydro has not prepared detailed interconnection studies for each of the remaining isolated diesel systems as it has been self-evident to Hydro that there is no economics in interconnecting them to the appropriate main grids. A preliminary desk top analysis was completed to identify the initial capital expenditure to interconnect each community based upon an order of magnitude cost per km for transmission lines and distribution lines, an order of magnitude cost per terminal station and a straight-line line routing which avoids major bodies of water but does not consider the topography of the land. The cumulative present worth (CPW) cost of interconnection of the communities was calculated for the period 2002 to 2022 and was based upon annual costs for energy, line losses and line maintenance. The cumulative present worth (CPW) cost of continued diesel operation was calculated for each system for the period 2002 to 2022 and was based upon diesel fuel, variable O&M and fixed O&M costs over the twenty-year period. A comparison of the CPW for interconnection and the CPW of continued diesel was used to determine if there is sufficient economics to warrant a detailed interconnection study and provides an indication on the magnitude of the impact an interconnect may have on the rural deficit. It should be noted that the preliminary analysis did not consider the technical implications (i.e. voltage regulation) on very long 69 kV transmission lines. The results of preliminary analysis are provided below.

a) The following table provides the initial capital expenditure to interconnect and compares the CPW cost of interconnection to the CPW cost of continued diesel operation for the isolated diesel communities in Labrador north of Happy Valley – Goose Bay.

Initial Capital Expenditure, CPW of Interconnection and CPW of Continued Diesel for Interconnection of Labrador Communities North of Happy Valley – Goose Bay

Diesel Plant	Intertie Point	Line Length (km)	Capital Cost to Interconnect $	CPW to 2022 Interconnection $	CPW to 2022 Continued Diesel $	CPW Preference For Diesel $
Rigolet	Happy Valley	188	24,560,000	29,047,000	5,155,000	
Makkovik	Rigolet	206	25,720,000	28,108,000	7,402,000	
Postville	Makkovik	90	11,800,000	12,863,000	4,666,000	
Hopedale	Postville	142	18,040,000	19,754,000	8,010,000	
Davis Inlet	Hopedale	118	16,832,000	18,461,000	12,327,000	
Nain	Davis Inlet	193	24,160,000	26,573,000	12,261,000	
Total		937	121,112,000	134,806,000	49,821,000	84,985,000

The combined interconnection of all communities north of Happy Valley – Goose Bay would result in a substantial increase in cost with a subsequent increase in the rural deficit. There is an $84,985,000 preference for continued diesel operation for communities north of Happy Valley - Goose Bay.

b) The interconnection of the communities south of Happy Valley – Goose Bay requires the construction of a 69 kV transmission system from the Labrador Interconnected System at Happy Valley – Goose Bay. The transmission system would follow the proposed route of the Southern Labrador Highway. It is inappropriate to compare the CPW cost of interconnection to the CPW cost of continued diesel on an individual community basis as the initial capital cost of interconnection for each community assumes that all communities between it and the original interconnected system (i.e. Happy Valley) have already been interconnected. As a result one must compare the total CPW costs for interconnection and continued diesel options for the entire interconnection plan. The following table provides the initial capital expenditure to interconnect and compares the CPW cost of interconnection to the CPW cost of continued diesel operation for Labrador communities south of Happy Valley – Goose Bay.

Initial Capital Expenditure, CPW of Interconnection and
CPW of Continued Diesel for
Interconnection of Labrador Communities South of Happy Valley – Goose Bay

Diesel Plant	Intertie Point	Line Length (km)	Capital Cost to Interconnect $ (1)	CPW to 2022 Interconnection $	CPW to 2022 Continued Diesel $	CPW Preference For Diesel $
Paradise River	Happy Valley	300	111,880,000	115,132,000	2,167,000	
Cartwright	Paradise River	47	6,640,000	7,391,000	8,939,000	
Charlottetown	Paradise River	120.3	13,736,000	15,025,000	8,687,000	
Black Tickle	Charlottetown Tap	86	13,578,000	14,584,000	4,341,000	
Norman Bay	Charlottetown	37	3,090,000	3,298,000	979,000	
Port Hope Simpson	Charlottetown Tap	30.2	4,624,000	5,116,000	5,608,000	
Williams Harbour	Port Hope Simpson	44.5	6,477,000	6,713,000	2,337,000	
St. Lewis	Port Hope Simpson	49.5	5,540,000	6,004,000	4,992,000	
Mary's Harbour	St. Lewis	38	5,500,000	6,155,000	7,896,000	
L'Anse au Loup	Mary's Harbour	143	18,160,000	20,287,000	12,637,000	
Total		895.5	189,225,000	199,705,000	58,583,000	141,122,000

Notes

(1) The capital cost to interconnect a community assumes that the 69 kV transmission system has already been extended from Happy Valley – Goose Bay to the community's intertie point (i.e. interconnection cost for Cartwright includes only the cost from Paradise River to Cartwright and assumes Paradise River has already been interconnected to Happy Valley – Goose Bay).

The combined interconnection of all communities south of Happy Valley – Goose Bay would result in a substantial increase in cost with a subsequent increase in the rural deficit. There is a $141,122,000 preference for continued diesel operation for communities south of Happy Valley - Goose Bay. If one were to remove L'Anse au Loup from the interconnection plan, there would be a preference of $133,472,000 for continued diesel operation in southern Labrador.

c) The following table provides the initial capital expenditure to interconnect and compares the CPW cost of interconnection to the CPW cost of continued diesel operation for the isolated diesel communities on the Island.

Initial Capital Expenditure, CPW of Interconnection and CPW of Continued Diesel for Interconnection of Isolated Island Communities						
Diesel Plant	Intertie Point	Line Length (km)	Capital Cost To Interconnect $	CPW to 2022 Interconnection $	CPW to 2022 Continued Diesel $	CPW Preference For Diesel $
St. Brendans	Burnside	20	12,718,000	13,392,000	3,226,000	10,166,000
Little Bay Islands	Beachside	10	5,654,000	6,421,000	3,561,000	2,860,000
Rencontre East	English Hr. West	41	6,170,000	7,183,000	3,246,000	3,937,000
Harbour Deep	Coney Arm	49	4,309,000	5,053,000	2,822,000	2,231,000
McCallum	Gaultois	27	18,299,000	18,662,000	2,178,000	16,484,000
Petites	Hr. Le Cou	5.8	1,527,000	1,643,000	1,475,000	168,000
Ramea	Burgeo	50	13,159,000	15,730,000	10,655,000	5,075,000
Grey River	Grandy Brook	60	9,200,000	10,271,000	2,281,000	7,990,000
Francois	Grey River	40	6,050,000	6,949,000	2,825,000	4,124,000
Total		302.8	77,086,000	85,304,000	32,269,000	53,035,000

The combined interconnection of the remaining isolated diesel communities on the Island would result in a substantial increase in cost with a subsequent increase in the rural deficit. There is combined $53,035,000 cumulative present worth preference for continued diesel operation on the Island.