Q. With respect to the PIRA forecast used in Exhibit 4 "Nalcor Energy / NLH Thermal Fuel Oil Price Forecast" as of January 2010:

a. Please provide an update of Exhibit 4 based on the most recent and readily available 2011 PIRA fuel price forecast; and

b. Please estimate what impact the revised and updated fuel price forecast has on the CPW for the Isolated Island option. Please describe the determination of the revised estimated CPW.

A. a. An update of Exhibit 4 is attached as page 5 to this response. It is based on PIRA's May 2011 long-term oil market forecast, with forecast fuel prices for 2011 and 2012 based on the short-term forecast available at the end of June/beginning of July, 2011[1].

b. The results of a fuel price sensitivity which reflects the May 2011 fuel forecast has been provided in Exhibit 43, filed in response to MHI-Nalcor-41. The determination of the revised estimated CPWs for both generation expansion alternatives is outlined in the following steps.

1. The starting point is the fuel price series for the Base Case, presented on page 10 of Exhibit 43. As noted at the bottom of page 10, No. 6 fuel costs for the Isolated Island Alternative were based on 0.7% sulphur content up to and including 2015, and switched to 2.2% sulphur content subsequently. For the Interconnected Island

[1] Please note that the long-term fuel forecast filed in response to MHI-Nalcor-126 is also based on PIRA's May 2011 long-term oil market forecast, but the forecast fuel prices for 2011 are based on the short-term forecast available at the end of May, which did not include a short-term revision for 2012.

Alternative, the reference fuel price series for 0.7% s was used for all years.

2. The fuel prices used for the May 2011 Fuel Price Sensitivity are presented on page 12 of Exhibit 43. As noted in the heading, this price series included a short-term update for 2011 and 2012 as of July, 2011, and reflects the 2011 and 2012 prices shown on page 5 attached to this response.

   The No. 6 price for the Interconnected Island alternative is the 0.7% S fuel for all years. The No. 6 price for the Isolated Island alternative is 0.7% S up to and including 2015 and 2.2% S thereafter.

   Fuel factors, also shown on page 12, were derived by relating the May 2011 forecast fuel prices used for the sensitivity to those used for the Base Case. For example, the 2016 fuel factor calculations, with page and column references, are shown in the following table. Column number references start with the Year column as column 1.

2016	(A) May 2011	(B) Base Case	(C) Fuel Factor (A / B)
Interconnected #6 $/bbl	135.60 (p. 12, Col. 2)	111.10 (p. 10, #6 0.7% s Col. 2)	1.22052 (p. 12, Col. 5)
Isolated Island #6	131.60	107.00	1.22991

$/bbl	(p. 12, Col. 3)	(p. 10, #6 2.2% s, Col. 5)	(p. 12, Col. 6)
#2 Diesel $/litre	1.14 (p. 12, Col. 4)	0.945 (p. 10, #2 Diesel, Col. 8)	1.20635 (p. 12, Col. 7)

3. Once the fuel factors had been calculated, they were brought forward to the sensitivity worksheet (page 9 of Exhibit 43) and applied to the fuel costs used in the base cases. Fuel costs by type for the base cases was presented in Exhibit 99 filed in response to MHI-Nalcor-1.

   For the Isolated Island alternative, the base case fuel costs are presented in columns 2, 3 and 4, and the derived fuel factors are presented in columns 5 and 6. Costs for the fuel sensitivity are calculated in columns 7, 8 and 9 by applying the fuel factors to the base case fuel costs.

   For the Interconnected Island alternative, the base case fuel costs are presented in columns 10, 11 and 12 and the derived fuel factors are presented in columns 13 and 14. Costs for the fuel sensitivity are calculated in columns 15, 16, and 17 by applying the fuel factors to the base case fuel costs.

   Continuing with the 2016 example, fuel costs for the sensitivity were calculated as follows:

2016	(A)	(B)	(C)

	Base Case Fuel Costs ($000)	Fuel Factor	Sensitivity Fuel Costs ($000) (A x B)
Isolated Island No. 6	252,720 (p. 9, Col. 2)	1.22991 (p. 9, Col. 5)	310,822 (p. 9, Col. 7)
Isolated Island No. 2	4,320 (p. 9, Col. 3)	1.20635 (p. 9, Col. 6)	5,212 (p. 9, Col. 8)
Interconnected No. 6	307,523 (p. 9, Col. 10)	1.22052 (p. 9, Col. 13	375,339 (p. 9, Col. 15)
Interconnected No. 2	6,041 (p. 9, Col. 11	1.20635 (p. 9, Col. 14	7,287 (p. 9, Col. 16)

4. The CPW for each alternative was calculated on the first line on page 9. For the Isolated Island alternative, the value (in $000) of $6,933,658 is reported in column 9. For the Interconnected Island alternative, the value (in $000) of $1,406,558 is reported in column 17.

These values were brought forward to the Fuel line for the "Fuel Costs: May 2011 Forecast" scenario on the Results worksheet (Exhibit 43, p. 3), replacing fuel costs reported for each base case.

The sensitivity totals reported on the Results worksheet were brought forward to the Summary worksheet (Exhibit 43, p. 1).

PIRA Forecast May 2011 (w/ short term updates for 2011 & 2012 as of July, 2011)

	#6 0.3%s ($Cdn/bbl)	#6 0.7%s ($Cdn/bbl)	#6 1.0%s ($Cdn/bbl)	#6 2.2%s ($Cdn/bbl)	#6 3.0%s ($Cdn/bbl)	Diesel ($Cdn/l)
2011	111.80	101.10	97.30	94.10	94.10	0.876
2012	121.50	114.30	111.80	107.90	107.90	0.961
2013	129.10	122.50	121.30	119.20	118.90	1.025
2014	133.70	126.90	125.70	123.40	123.10	1.060
2015	138.20	130.80	129.50	127.10	126.80	1.100
2016	143.20	135.60	134.10	131.60	131.20	1.140
2017	148.40	140.70	138.90	136.00	135.60	1.180
2018	152.20	144.30	142.40	139.00	138.50	1.210
2019	156.00	147.90	145.90	141.80	141.20	1.240
2020	161.10	151.50	148.30	142.80	142.00	1.275
2021	164.00	153.60	150.00	144.20	143.40	1.315
2022	166.60	155.50	151.80	145.80	144.90	1.350
2023	169.60	157.80	154.00	147.70	146.80	1.385
2024	173.10	160.70	156.80	150.20	149.20	1.425
2025	175.90	162.80	158.80	152.00	151.00	1.460
2026	179.40	166.00	162.00	155.00	154.00	1.490
2027	183.00	169.30	165.20	158.10	157.10	1.520
2028	186.70	172.70	168.50	161.30	160.20	1.550
2029	190.40	176.20	171.90	164.50	163.40	1.580
2030	194.20	179.70	175.30	167.80	166.70	1.615
2031	198.10	183.30	178.80	171.20	170.00	1.645
2032	202.10	187.00	182.40	174.60	173.40	1.680
2033	206.10	190.70	186.10	178.10	176.90	1.715
2034	210.20	194.50	189.80	181.60	180.40	1.745
2035	214.40	198.40	193.60	185.30	184.00	1.780
2036	218.70	202.40	197.40	189.00	187.70	1.820
2037	223.10	206.40	201.40	192.70	191.40	1.855
2038	227.50	210.50	205.40	196.60	195.30	1.890
2039	232.10	214.80	209.50	200.50	199.20	1.930
2040	236.70	219.10	213.70	204.50	203.20	1.970
2041	241.50	223.40	218.00	208.60	207.20	2.005
2042	246.30	227.90	222.30	212.80	211.40	2.045
2043	251.20	232.50	226.80	217.00	215.60	2.090

Source:
- 2013-2025 pricing based on PIRA Energy Group long term NYH price forecast , May 6, 2011
- Post 2025 pricing is forecast at annual inflation of 2%. Rounding differences may be present.
- Nalcor Energy