Q. Re: NP-NLH-069 (Revision 1, Dec 3-14): Please explain why the change (ten-year versus five-year regression analysis, inclusion of running fuel heating content) in Holyrood conversion factor projection methodology was required? Please provide the impact of both changes (separately) to the projected conversion factor for 2015 Test Year and explain the impact.

A. The change (ten-year versus five-year regression analysis, inclusion of running fuel heating content) in Holyrood conversion factor projection methodology was required to account for the recent period of decline in the conversion rate. As indicated in Hydro's Amended Application, Hydro has incurred significant financial losses since 2009 (Section 2.61, Pages 2.74-2.75) as a result of this decline as there is no provision for recovery. Performance has deteriorated due to a lower fuel heating content and lower production requirements, both factors that are external to the operation of the generating plant. By reducing the regression period and including the fuel heating content, the analysis becomes more reflective of future operating conditions and will provide for a better projection of the fuel conversion rate.

Table 1 presents the fuel conversion rate projections under the following scenarios:

- Ten-year regression with no BTU content;
- Five-year regression with no BTU content; and
- Five-year regression with BTU content (as per Hydro's Amended Application).

Tables 2, 3 and 4 provide the results of the regression analysis under each scenario and the detailed calculation of the conversion rate.

Table 1

Scenario	Conversion Rate Projection (kWh/bbl)
10 year regression with no BTU content	622
5 year regression with no BTU content	605
5 year regression with BTU content	607

Table 2

10 Year Regression with no BTU Content

2004-2014 Linear Regression (Gross)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.992
R Square	0.985
Adjusted R Square	0.984
Standard Error	2.840
Observations	94

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	47312.3	47312.3	5866.0	0.0
Residual	92	742.0	8.1		
Total	93	48054.3			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**15.3010**	1.5741	9.7202	0.0000	12.1747	18.4274	12.1747	18.4274
X Variable 1	**0.00137**	0.0000	76.5898	0.0000	0.0013	0.0014	0.0013	0.0014

Calculation of Fuel Conversion Rate:

1	Unit net average loading (kW)	109,570	
2	Station Service Factor	6.61%	
3	Unit gross average loading (kW)	117,330	Line 1/(1-Line 2)
4	Regression Slope (m)	0.00137	(from regression equation)
5	Regression Y-Intercept (b)	15.3010	(from regression equation)
6	Fuel consumption rate (bbls/hour)	176.06	Line 5 + Line 4 x Line 3
7	Net fuel conversion factor (kWh/bbl)	**622**	Line 1/Line 6

Table 3

5 Year Regression with no BTU Content

2009-2014 Linear Regression (Gross)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.984
R Square	0.967
Adjusted R Square	0.967
Standard Error	2.764
Observations	43

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	9277.5	9277.5	1214.3	0.0
Residual	41	313.2	7.6		
Total	42	9590.8			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**8.8478**	3.4653	2.5532	0.0145	1.8494	15.8461	1.8494	15.8461
X Variable 1	**0.00147**	0.0000	34.8469	0.0000	0.0014	0.0016	0.0014	0.0016

Calculation of Fuel Conversion Rate:

1	Unit net average loading (kW)	109,570	
2	Station Service Factor	6.61%	
3	Unit gross average loading (kW)	117,330	Line 1/(1-Line 2)
4	Regression Slope (m)	0.00147	(from regression equation)
5	Regression Y-Intercept (b)	8.8478	(from regression equation)
6	Fuel consumption rate (bbls/hour)	181.04	Line 5 + Line 4 x Line 3
7	Net fuel conversion factor (kWh/bbl)	**605**	Line 1/Line 6

Table 4

5 Year Regression with BTU Content

2009-2014 Linear Regression (Gross)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.989
R Square	0.978
Adjusted R Square	0.977
Standard Error	2.303
Observations	43

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	9378.6	4689.3	884.2	0.0
Residual	40	212.1	5.3		
Total	42	9590.8			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**155.9173**	33.8078	4.6119	0.0000	87.5892	224.2455	87.5892	224.2455
	0.0014	0.0000	39.8164	0.0000	0.0014	0.0015	0.0014	0.0015
	-0.0009	0.0002	-4.3661	0.0001	-0.0014	-0.0005	-0.0014	-0.0005

Calculation of 2015 Test Year Conversion Rate:

1	Unit net average loading (kW)	109,570	
2	Fuel Heating Content (btu/bbl)	152,400	
3	Station Service Factor	6.61%	
4	Unit gross average loading (kW)	117,330	Line 1/(1-Line 3)
5	Coefficient 1	0.00143	(from regression equation)
6	Coefficient 2	-0.00094	(from regression equation)
7	Intercept	155.9173	(from regression equation)
8	Fuel consumption rate (bbls/hour)	180.53	Line 7 + (Line 4 x Line 5) + (Line 2 x Line 6)
9	Net fuel conversion factor (kWh/bbl)	**607**	Line 1/Line 8