

EB-2010-0137

Undertaking JT_1.1, JT_1.2 and JT_1.3

OEB Staff Technical Conference

5) Ref: Board Staff IRR #10 and E 3/ p. 6 – System Load Regression Model

Milton Hydro stated that it has not considered any other economic variable or income variable. In response to Board staff IR #10 b) Milton Hydro provided a load forecast based on a regression model including Ontario GDP as an economic variable.

- a) Please provide the regression model for the load forecast provided in interrogatory response #10 b).
- b) Please confirm that a step-wise regression methodology was used.
 - i) If not, please explain why not.
- c) Please provide an alternative model using an economic or income variable other than GDP.
- d) Please provide an alternative model including the GDP, excluding number of customers

Response:

- a) Milton Hydro has provided a table below setting out the regression model for the load forecast provided in interrogatory response #10 b).

Regression Statistics	Residential		General Service <50 kW		General Service >50-999 kW	
Multiple R	0.9792		0.9672		0.9577	
R Square	0.9589		0.9354		0.9172	
Adjusted R Square	0.9560		0.9316		0.9105	
Standard Error	687296.3588		154697.2197		377127.3901	
Observations	108		108		108	
	Coefficients	t Stat	Coefficients	t Stat	Coefficients	t Stat
Intercept	-17252558.06	-4.366	-2127803.68	-3.126	1327686.73	0.600
Heating Degree Days	6485.15	14.424	2048.24	20.357	1239.50	5.087
Cooling Degree Days	32184.07	11.985	5595.51	9.428	7298.96	5.047
Number of Days in Month	556261.99	6.618	106532.19	5.643	180726.44	3.716
Spring Fall Flag	-1481377.45	-7.940	-179370.53	-4.294	-208709.03	-2.052
Blackout Flag	-1903260.68	-2.698	-	-	-1274354.67	-3.262
Number of Peak Hours	-	-	-	-	7893.66	3.265
Ontario GDP	32525.19	1.179	-14308.599	-2.497	-72800.67	-3.452
Number of Customers	557.07	13.270	2880.53	12.439	55911.81	11.275

b) Milton Hydro confirms that a step-wise approach was undertaken as a means to maximize the number of regression variables that were statistically significant.

c) Milton Hydro has provided the following table which sets out an alternative regression model using the unemployment rate as an economic or income variable.

Regression Statistics	Residential		General Service <50 kW		General Service >50-999 kW	
Multiple R	0.9784		0.9676		0.9663	
R Square	0.9572		0.9363		0.9337	
Adjusted R Square	0.9538		0.9320		0.9276	
Standard Error	656444.3284		152960.1767		325623.3160	
Observations	96		96		96	
	Coefficients	t Stat	Coefficients	t Stat	Coefficients	t Stat
Intercept	-13910254.59	-5.278	-3659678.24	-5.759	-7512204.76	-5.424
Heating Degree Days	6732.31	15.022	2073.46	19.917	1528.18	6.897
Cooling Degree Days	35265.81	13.123	5638.44	9.104	8703.08	6.574
Number of Days in Month	561876.60	6.560	110696.06	5.555	177073.68	3.958
Spring Fall Flag	-1471239.94	-7.889	-191607.75	-4.421	-169797.46	-1.841
Blackout Flag	-2085300.31	-3.073	-	-	-1171438.84	-3.440
Number of Peak Hours	-	-	-	-	9105.05	4.042
Unempl Rate	-46806.68	-0.461	75468.96	3.205	238048.36	4.729
Number of Customers	610.46	35.350	2369.82	24.353	44027.66	32.444

d) Milton Hydro has provided the table below which sets out an alternative model including the GDP, excluding number of customers

Regression Statistics	Residential		General Service <50 kW		General Service >50-999 kW	
Multiple R	0.9415		0.9146		0.9004	
R Square	0.8865		0.8365		0.8108	
Adjusted R Square	0.8797		0.8285		0.7975	
Standard Error	1136352.5519		244945.5335		567118.0561	
Observations	108		108		108	
	Coefficients	t Stat	Coefficients	t Stat	Coefficients	t Stat
Intercept	-54318364.24	-11.754	-5357322.17	-5.378	-16098000.67	-6.758
Heating Degree Days	5413.48	7.403	1865.63	11.837	998.11	2.735
Cooling Degree Days	24284.03	5.609	4463.80	4.807	5615.27	2.596
Number of Days in Month	621875.85	4.482	112285.84	3.757	208317.27	2.852
Spring Fall Flag	-1838197.66	-6.022	-232603.38	-3.535	-280904.56	-1.840
Blackout Flag	-1840969.81	-1.578	-	-	-1347365.46	-2.293
Number of Peak Hours	-	-	-	-	6978.86	1.921
Ontario GDP	374725.59	23.090	51482.412	14.746	157032.95	19.317