



uniongas

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ONTARIO ENERGY BOARD

October 15, 2007

Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Attention: Ms. Kirsten Walli, Board Secretary

Re: Multi-Year Incentive Rate Regulation for Natural Gas Utilities
EB-2007-0606

Dear Ms. Walli:

Enclosed, please find:

- JTA.16 Corrected

The table for the Southern Operations area was inadvertently left out in part a) of the response.

Yours truly,

Connie Burns, CMA, PMP
Manager, Regulatory Initiatives

Enclosure

cc: All Intervenors
Michael Penny, Torys

UNION GAS LIMITED

Undertaking of Union Gas to
The Building Owners and Managers Association of the Greater Toronto Area ("BOMA")
The London Property Management Association ("LPMA")
The Wholesale Gas Service Purchasers Group ("WGSPG")

C3/C16/C33.34

Part b of the question has not been answered in full as the response found in C23.12 does not provide the same analysis performed by Enbridge.

- a) Please provide the same analysis as used in the Enbridge EB-2006-0034 proceeding including the same period for the analysis of 1990 through 2005, and the calculation of the MPE, MAPE, RMSPE, O/U and standard deviation statistics.
- b) Please provide the ranking of the results for each of the South and North areas using the same weighting scheme utilized by Enbridge.
- c) Did Union have actual 2006 degree day data when it filed its 2007 rates application?
- d) Is Union's analysis based on the premise of a 2 year ahead forecast (for example, the 2004 forecast is based on actual data up to and including 2002)?
- e) For each forecast methodology shown in the response to the above, please provide the 2007 forecast of heating degree days using the data up to and including 2005.

The ranking table originally provided in the filed interrogatory response provided at Exhibit C23.12 is re-produced and presented below. The revised table follows exactly the Enbridge scoring analysis. The total score in the tables equals the sum of the rankings for each method and not a weighted percentage score result.

The rankings are based on estimates spanning the 1985 to 2006 period. The score in this table compares performance rankings of the nine different weather normal methods. The lowest score indicates the best model. The lowest score occurs with the 20 year declining trend method. This result occurs in both the Southern and the Northern and Eastern operating areas. A similar conclusion was reached in the interrogatory response provided at Exhibit C23.12.

Question: October 3, 2007
Answer: October 11, 2007
Docket: EB-2007-0606 / EB-2007-0615

WEATHER NORMAL METHOD RANKING TABLE

UNION SOUTH		Weather Normal Estimation Methodology								
Criteria Weights	Criteria	20 Year Trend	Blended 55:45	Blended 50:50	Energy Probe	30 Year Trend	30 Year Average	20 Year Average	10 Year Average	Naïve Estimate
	MPE	2	5	4	7	3	9	7	6	1
	RMPSE	2	4	3	8	1	7	6	5	9
	O/U Freq.	1	4	3	2	1	3	5	4	1
	Std. Dev.	7	3	4	6	8	1	2	5	9
	Score	12	16	14	23	13	20	20	20	20

UNION NORTHERN & EASTERN		Weather Normal Estimation Methodology								
Criteria Weights	Criteria	20 Year Trend	Blended 55:45	Blended 50:50	Energy Probe	30 Year Trend	30 Year Average	20 Year Average	10 Year Average	Naïve Estimate
	MPE	2	6	4	8	3	9	7	5	1
	RMPSE	1	5	3	8	2	7	6	4	9
	O/U Freq.	1	2	1	5	2	6	4	3	1
	Std. Dev.	7	3	4	5	8	1	2	6	9
	Score	11	16	12	26	15	23	19	18	20

Notes:

MPE Mean percent error - this is a simple accuracy test: plus & minus will net out.

RMPSE Root mean percent square error - this a robust accuracy test: plus & minus do not net out.

O/U Freq. Over to under frequency ratio - this is a simple symmetry test.

Std. Dev. Standard deviation - this is a stability test.

Part a)

The following two tables present the analysis of the performance of each weather normalization method over the 1990 to 2005 period.

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Union Gas
Annual Heating Degree Days

UNION: SOUTH

Year	Actual	Weather Normal Estimation Methodology								Naïve Estimate
		20 Year Trend	Blended 55:45	Blended 50:50	Energy Probe	30 Year Trend	30 Year Average	20 Year Average	10 Year Average	
1990	3,572	3,950	3,967	3,965	4,014	4,023	3,980	4,005	3,980	3,986
1991	3,631	3,977	3,984	3,983	4,151	4,039	3,990	4,015	3,981	4,154
1992	4,031	3,872	3,931	3,926	3,886	3,972	3,979	3,996	3,912	3,572
1993	4,105	3,779	3,886	3,876	3,732	3,910	3,973	3,984	3,875	3,631
1994	4,055	3,828	3,910	3,902	3,843	3,915	3,976	3,971	3,877	4,031
1995	3,987	3,826	3,911	3,904	3,955	3,933	3,981	3,989	3,897	4,105
1996	4,153	3,847	3,925	3,918	4,004	3,929	3,989	3,990	3,903	4,055
1997	4,005	3,824	3,915	3,907	4,008	3,928	3,989	3,999	3,909	3,987
1998	3,225	3,890	3,947	3,942	4,024	3,953	3,994	3,994	3,936	4,153
1999	3,641	3,896	3,949	3,944	3,999	3,958	3,993	3,993	3,968	4,005
2000	3,876	3,780	3,883	3,874	3,795	3,850	3,967	3,936	3,892	3,225
2001	3,467	3,745	3,861	3,851	3,775	3,804	3,957	3,911	3,840	3,641
2002	3,636	3,784	3,878	3,869	3,847	3,792	3,954	3,891	3,871	3,876
2003	3,958	3,707	3,835	3,824	3,821	3,718	3,941	3,865	3,854	3,467
2004	3,786	3,677	3,810	3,798	3,887	3,703	3,919	3,846	3,815	3,636
2005	3,778	3,709	3,829	3,818	3,874	3,693	3,926	3,848	3,800	3,958
Avg. Error		12	95	87	107	76	163	146	88	36
MPE		0.81%	2.98%	2.79%	3.34%	2.48%	4.76%	4.30%	2.80%	1.54%
RMPSE		7.97%	8.15%	8.10%	9.18%	8.30%	8.78%	8.58%	8.15%	11.43%
O/U Freq.		37.5%	56.3%	50.0%	56.3%	37.5%	56.3%	62.5%	56.3%	50.0%
Std. Dev.		86	50	54	113	110	24	60	54	277

Notes:

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O/U Freq. Over to under frequency ratio - this is a simple symmetry test.
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Union Gas

Annual Heating Degree Days

UNION: Northern & Eastern

Year	Actual	Weather Normal Estimation Methodology								
		20 Year Trend	Blended 55:45	Blended 50:50	Energy Probe	30 Year Trend	30 Year Average	20 Year Average	10 Year Average	Naïve Estimate
1990	4,994	5,194	5,258	5,252	5,146	5,276	5,311	5,305	5,256	5,317
1991	5,019	5,244	5,290	5,285	5,350	5,313	5,327	5,332	5,276	5,654
1992	5,489	5,182	5,258	5,251	5,182	5,256	5,320	5,311	5,219	4,994
1993	5,460	5,115	5,226	5,216	5,095	5,196	5,317	5,298	5,212	5,019
1994	5,294	5,214	5,275	5,270	5,260	5,216	5,325	5,285	5,218	5,489
1995	5,358	5,206	5,274	5,268	5,306	5,234	5,330	5,311	5,244	5,460
1996	5,550	5,220	5,280	5,275	5,270	5,228	5,329	5,304	5,256	5,294
1997	5,384	5,210	5,273	5,267	5,299	5,244	5,325	5,315	5,248	5,358
1998	4,457	5,303	5,317	5,316	5,339	5,285	5,329	5,310	5,286	5,550
1999	4,754	5,303	5,315	5,314	5,332	5,305	5,325	5,320	5,352	5,384
2000	5,158	5,160	5,233	5,226	5,163	5,194	5,292	5,261	5,266	4,457
2001	4,592	5,077	5,189	5,179	5,168	5,105	5,280	5,226	5,176	4,754
2002	4,997	5,107	5,197	5,189	5,234	5,099	5,271	5,206	5,192	5,158
2003	5,111	4,960	5,119	5,104	5,206	5,004	5,249	5,181	5,150	4,592
2004	5,148	4,953	5,102	5,089	5,404	5,008	5,224	5,159	5,100	4,997
2005	4,829	4,948	5,103	5,089	5,269	4,970	5,229	5,155	5,065	5,111
Avg. Error		50	132	125	152	84	199	168	120	62
MPE		1.38%	2.99%	2.84%	3.40%	2.03%	4.30%	3.68%	2.76%	1.64%
RMPSE		7.08%	7.31%	7.27%	7.86%	7.00%	7.82%	7.44%	7.29%	9.74%
O/U Freq.		50.0%	56.3%	50.0%	62.5%	50.0%	68.8%	62.5%	56.3%	56.3%
Std. Dev.		115	71	75	86	112	37	61	72	345

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O/U Freq. Over to under frequency ratio - this is a simple symmetry test.
Std. Dev. Standard deviation - this is a stability test.

Part b)

The table below shows the performance ranking of the weather methods analyzed and tabled in part a) of this question above. The analysis period is 1990 to 2005. The table shows that the lowest score of 8 in the Southern operating area is obtained with the 20 year trend method. In the Northern and Eastern operating area both the 20 year trend and the 30 year trend tie for the best with a low score of 12. This tie is broken when the analysis examines the results calculated using a longer period of time. The table presented in the clarification section shown at the beginning of this response shows that over the 1985 to 2006 period the 20 year trend method is superior to the 30 year trend method (a score of 11 versus 15). Conclusion: the 20 year trend outperforms the other methods.

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	O/U Freq.	1	3	2	3	1	3	4	3	2
	Std. Dev.	5	2	3	7	6	1	4	3	8
	Score	8	14	11	25	15	20	22	15	21

UNION NORTHERN & EASTERN		Weather Normal Estimation Methodology								
Criteria Weights	Criteria	20 Year Trend	Blended 55:45	Blended 50:50	Energy Probe	30 Year Trend	30 Year Average	20 Year Average	10 Year Average	Naïve Estimate
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	RMPSE	2	5	3	8	1	7	6	4	9
	O/U Freq.	1	2	1	3	1	4	3	2	2
	Std. Dev.	8	3	5	6	7	1	2	4	9
	Score	12	16	14	24	12	21	19	14	22

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O/U Freq. Over to under frequency ratio - this is a simple symmetry test.

Std. Dev. Standard deviation - this is a stability test.

Part c)

Union did not have actual 2006 degree-day data when it filed its 2007 rates application as the year was not completed.

Part d)

A two year regulatory lag is recognized in the analysis. The example provided in the question is correct; the 2004 test year weather normal estimate is based on actual weather data up to and including the year 2002.

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Part e)

The table below shows the weather normal estimates for the year 2007 obtained by the nine different weather normal methods.

UNION GAS
YEAR 2007 WEATHER NORMAL ESTIMATES
annual heating degree-days

<u>Weather Normal Method</u>	<u>Operating Area</u>	
	<u>Southern</u>	<u>Northern & Eastern</u>
20 Year Trend	3,714	4,917
55:45 Blend	3,825	5,078
50:50 Blend	3,815	5,063
Energy Probe	3,828	5,094
30 Year Trend	3,655	4,915
30 Year Average	3,917	5,209
20 Year Average	3,830	5,123
10 Year Average	3,752	4,998
Naïve Method	3,778	4,423

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