

UNION GAS LIMITED  
Southern Operations Area  
General Service Customer Bill Impacts

Line No.		Rate M1 - Residential (Annual Consumption of 2,600 m³)		
		EB-2011-0135 Approved 01-Jul-11 Total Bill (\$) (a)	EB-2011-0283 Including RNG (1) 01-Jul-11 Total Bill (\$) (b)	Annual Bill Impact (\$) (c) = (b) - (a)
	<u>Delivery Charges</u>			
1	Monthly Charge	240.00	240.00	-
2	Delivery Commodity Charge	92.68	92.68	-
3	Prospective Recovery - Delivery	0.01	0.01	-
4	Storage Services	25.42	25.42	-
5	Total Delivery Charge	358.11	358.11	-
	<u>Supply Charges</u>			
6	Transportation to Union	144.69	162.65	17.96
7	Commodity & Fuel	388.14	388.14	-
8	Prospective Recovery - Commodity & Fuel	(30.10)	(30.10)	-
9	Subtotal	358.04	358.04	-
10	Total Gas Supply Charge	502.73	520.69	17.96
11	Total Bill	860.84	878.80	17.96
12	Annual Bill Impact - Sales Service (line 11)			17.96
13	Annual Bill Impact - Direct Purchase (line 5)			-

Notes:

(1) RNG purchase of 1.7 PJ's (1.8%) of Union South System Supply

UNION GAS LIMITED  
Northern & Eastern Operations Area  
General Service Customer Bill Impacts

Line No.		(Eastern) Rate 01 - Residential (Annual Consumption of 2,600 m³)		
		EB-2011-0135 Approved 01-Jul-11 Total Bill (\$) (a)	EB-2011-0283 Including RNG (1) 01-Jul-11 Total Bill (\$) (b)	Annual Bill Impact (\$) (c) = (b) - (a)
	<u>Delivery Charges</u>			
14	Monthly Charge	240.00	240.00	-
15	Delivery Commodity Charge	193.45	193.45	-
16	Total Delivery Charge	433.45	433.45	-
	<u>Supply Charges</u>			
17	Transportation to Union	227.77	227.77	-
18	Prospective Recovery - Transportation	31.25	31.25	-
19	Storage Services	66.83	66.83	-
20	Prospective Recovery - Storage	-	-	-
21	Subtotal	325.85	325.85	-
22	Commodity & Fuel	388.15	388.15	-
23	Prospective Recovery - Commodity & Fuel	(51.04)	(32.76)	18.28
24	Subtotal	337.11	355.39	18.28
25	Total Gas Supply Charge	662.96	681.24	18.28
26	Total Bill	1,096.41	1,114.69	18.28
27	Annual Bill Impact - Sales (line 26)			18.28
28	Annual Bill Impact - Direct Purchase (line 16 + line 21)			-

Notes:

(1) RNG purchase of 0.5 PJ's (1.2%) of Union North System Supply.

UNION GAS LIMITED  
Southern Operations Area  
Calculation of Gas Supply Commodity Charges - Including RNG Purchase

Line No.	Particulars	EB-2011-0135		EB-2011-0283		RNG-Related Change	
		Effective July 1, 2011 (cents/m <sup>3</sup> ) (a)	Effective July 1, 2011 (\$/GJ) (1) (b)	Effective July 1, 2011 (cents/m <sup>3</sup> ) (c)	Effective July 1, 2011 (\$/GJ) (1) (d)	Effective July 1, 2011 (cents/m <sup>3</sup> ) (e) = (c) - (a)	Effective July 1, 2011 (\$/GJ) (f) = (d) - (b)
1	Alberta Border Price	14.2016	3.762	14.2016	3.762	-	-
2	Fuel Ratios	2.908%	2.908%	2.908%	2.908%	-	-
3	Compressor Fuel Charge	0.4130	0.109	0.4130	0.109	-	-
4	Administration Charge	0.3138	0.083	0.3138	0.083	-	-
5	Gas Commodity & Fuel Rate (line 1+3+4)	14.9284	3.954	14.9284	3.954	-	-
<u>Prospective Recovery</u>							
6	Inventory Revaluations	0.6367	0.169	0.6367	0.169	-	-
7	Spot Gas	-	-	-	-	-	-
8	Firm PGVA	(1.7944)	(0.475)	(1.7944)	(0.475)	-	-
9	Temporary Charge/(Credit)	-	-	-	-	-	-
10	Prospective Recovery (line 6+7+8+9)	(1.1577)	(0.306)	(1.1577)	(0.306)	-	-
11	Total Commodity and Fuel Rate (line 5+10)	13.7707	3.648	13.7707	3.648	-	-
12	Transportation Tolls	5.5644	1.474	6.2552	1.657 (2)	0.6908	0.183
13	Total Commodity & Fuel & Transportation Rate (line 11+12)	19.3351	5.122	20.0259	5.305	0.6908	0.183

Notes:

- (1) Conversion to GJs based on avg. heating value of Western suppliers of 37.75 GJ / 10<sup>3</sup> m<sup>3</sup>.  
(2) Includes impact related to RNG purchase of 1.7 PJs (1.8%) of Union South System Supply.

(Compares to schedule filed in July 1, 2011 QRAM EB-2011-0135, Tab 2, Schedule 1, p. 1)

ENBRIDGE GAS DISTRIBUTION INC.  
UNION GAS LIMITED  
RESPONSE TO FEDERATION OF RENTAL-HOUSING PROVIDERS OF ONTARIO  
INTERROGATORY #9

REFERENCES REFER TO THE COMMON EVIDENCE OF THE UTILITIES

REF: EX. B., TAB 1, PG. 20

Preamble: The evidence states: "According to the report prepared by Alberta Innovates and attached as Exhibit B, Tab 1, Appendix 1, the use of near-term RNG could lead to a potential reduction in GHG emissions of approximately 13 million tonnes of CO<sub>2</sub>e, or more than 45% of Ontario's 2020 GHG emissions reduction target."

Potential Reduction of 45% of Ontario's 2020 GHG emissions reduction target

- a) Is the 45% calculated using the Utilities proposed annual caps of a total of 5.5PJ?
  - b) If not, please provide the emission reduction figure that corresponds to 5.5PJ cap.
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**Response:**

- a) No. The 45% is not calculated using the Utilities proposed combined annual program caps of 5.5PJ.
- b) The emission reduction figure that corresponds to 5.5 PJ cap is approximately 2.4 million tonnes of CO<sub>2</sub>e, which is 8.1% of Ontario's 2020 GHG emissions reduction target. This assumes the same mix of projects are used as the AI report, including both emissions and fuel substitution.

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ENBRIDGE GAS DISTRIBUTION INC.  
UNION GAS LIMITED  
RESPONSE TO VECC INTERROGATORY #10

3.0: Impacts on the Distribution System

Reference: Exhibit B Tab 1 Page 22 Exhibit B, Tab 1, Appendix 5.

Preamble: Electrigaz then worked with EGD and Union to develop a single, simple pricing model for each of AD and landfill-sourced RNG. The pricing models were developed with a view to settling on prices that would support an ROE in the proximity of 11% in a number of scenarios, without the price exceeding a threshold determined by the Utilities to be excessive and unlikely to be supported by their customer base.

- a. Using typical hypothetical cases for each of LG and AD provide pricing model runs in Excel active spreadsheet format. List all assumption and provide commentary and explanatory notes.
  - b. Using data from the consultant's sources and/or the OPA Website run comparable price models for electricity production at the same scale and similar assumptions (as long as these are compatible with the FIT program). Provide the results in Excel active spreadsheet format with input assumptions and explanatory notes.
  - c. Confirm that the FIT program is under review and prices may change as a result.
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**Response:**

- a. Please see the response to LPMA Interrogatory #27 for Union (Exhibit IU-11-27), regarding provision of the model. Please see the response to LPMA Interrogatory #16 (Exhibit I-11-16) for outputs to provide details on several scenarios run.
- b. The Electrigaz biomethane costing and pricing model is not fully adapted to precisely perform this electrical analysis. However, with a minor adaption and using general market data the following results were obtained:

FIT converted in \$/GJ (no threshold)

$\$/kWh * (1kWh/0.0036GJ) * (40\% / 95\%)$

*Percentage represents a systems efficiency average*

Results	Project Cost	ROE	Applicable FIT	Converted in
<i>AD scenarios</i>			<i>\$/kWh</i>	<i>\$/GJ</i>
<b>Baseline Farm</b>	\$ 4,448,919	-	\$ 0.1618	\$ 18.45
<b>Large Farm</b>	\$ 5,751,962	12.2%	\$ 0.1486	\$ 16.95
<b>Coop Farm</b>	\$ 8,200,289	21.3%	\$ 0.1486	\$ 16.95
<b>SSO (Municipal)</b>	\$ 31,524,253	10.1%	\$ 0.1486	\$ 16.95
<b>Industrial</b>	\$ 29,282,343	-	\$ 0.1486	\$ 16.95
<b>WWTP</b>	\$ 2,492,935	7.9%	\$ 0.1618	\$ 18.45
<i>Landfill scenarios</i>				
<b>Small landfill</b>	\$ 5,077,647	9.5%	\$ 0.1122	\$ 12.80
<b>Medium landfill</b>	\$ 9,107,041	23.8%	\$ 0.1122	\$ 12.80
<b>Large landfill</b>	\$ 17,482,106	69.0%	\$ 0.1122	\$ 12.80

(Where ROE's are negative, no figure is included in the table)

Same scenarios with Genset instead of Upgrading

*Capex for major overhaul every 60000 hrs (approximately twice in 20 yrs) of the Genset upfront, connection to electrical grid = connection to gas grid*

Results	Project Cost	ROE	OPEX	Electricity	Applicable FIT
<i>AD scenarios</i>			<i>\$/yr</i>	<i>kW</i>	<i>\$/kWh</i>
<b>Baseline Farm</b>	\$ 3,841,075	-	\$ 242,239	316	\$ 0.1618
<b>Large Farm</b>	\$ 5,587,221	4.6%	\$ 377,972	647	\$ 0.1486
<b>Coop Farm</b>	\$ 7,949,528	12.0%	\$ 536,346	975	\$ 0.1486
<b>SSO (Municipal)</b>	\$ 31,147,851	-	\$ 2,680,415	1,232	\$ 0.1486
<b>Industrial</b>	\$ 29,151,657	-	\$ 2,760,012	1,584	\$ 0.1486
<b>WWTP</b>	\$ 1,176,637	64.5%	\$ 52,093	225	\$ 0.1618
<i>Landfill scenarios</i>					
<b>Small landfill</b>	\$ 3,315,119	-	\$ 317,780	790	\$ 0.1122
<b>Medium landfill</b>	\$ 7,686,119	-	\$ 740,974	1,846	\$ 0.1122
<b>Large landfill</b>	\$ 23,141,165	-	\$ 2,431,608	6,189	\$ 0.1122

(Where ROE's are negative, no figure is included in the table)

At first it appears significantly different from OPA FIT projections but note that:

- Electrigaz model considers gate fee revenues for AD scenarios which are large contributor to ROE.
  - It is assumed that the capital cost of electrical grid connection equals capital cost of the natural gas grid connection.
- c. The Utilities confirm that the OPA FIT program is currently under review, as per the two year cycle of scheduled reviews. The outcomes of this review are unknown at this time.