October 25, 2012

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Ms. Walli:

RE: EB-2012-0337 – Union Gas Limited – 2013-2014 Demand Side Management Plan for Large Volume Customers – Interrogatory Responses

Please find attached Union's interrogatory responses for the above noted proceeding. The responses incorporate the changes to evidence (Updated Exhibit A and Schedules) filed October 25, 2012.

If you have any questions, please contact me at 519-436-4521.

Yours truly,

[Original signed by]

Marian Redford
Manager, Regulatory Initiatives

cc: Alexander Smith (Torys)
EB-2012-0337 Intervenors

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit A, Tab 1, Page 7 of 36

Union is proposing to change the customer incentive budget process for Rate T2 and Rate 100 customers to a new Direct Access budget mechanism.

a) Please discuss how the customer incentive amount is determined for each customer.

b) If it is determined by a Rate T2 and/or a Rate 100 customer that it is not in its best interest to use customer incentive funding in 2013, but rather that it is more prudent to do so in 2014, is this acceptable under the proposed program structure? Please discuss.

Response:

a) Please see the response at Exhibit B4.6 a)

b) Rate T2 and Rate 100 customers cannot carryover any designated customer incentive funding in 2013 to 2014. A customer must use the funds to identify and implement energy efficiency projects within the program year or lose the funds. After August 1st, any Direct Access funds that have not been spent or earmarked will be made available to all customers within their respective rate classes. Customer incentives not spent at the conclusion of the program year will be tracked in the Demand Side Management Variance Account (DSMVA) and refunded to all customers in the rate class as part of Union's annual deferral disposition proceeding.

No carry over provision is consistent with the annual nature of the DSM plans for all other rate classes where budget, target and incentives are determined annually.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit A, Tab 1, Page 16 of 36

Union has removed the ability to overspend the Large Volume DSM budget by 15% in Rate T2 and Rate 100 to provide greater rate certainty for these customers. Union has maintained access to the 15% allowable overspend for Rate T1 up to a maximum of 15% of the program and portfolio budget allocated to Rate T1.

a) Please provide the Rate T1 program and portfolio budget.

b) Please provide the Rate T2 and Rate 100 program and portfolio budget.

c) Please provide the maximum amount of additional funding Union can access for Rate T1 under the parameters outlined above.

d) Please provide a table that outlines the proposed large volume DSM budget if the Board does not accept Union's proposed T2 rate structure. Within the table, provide the expected budget for T1 customers and Rate 100 customers.

Response:

a) The 2013 Rate T1 program and portfolio budget is $1.697 million. For 2014, the 2013 Rate T1 program and portfolio budget will be escalated by inflation.

b) The 2013 Rate T2 and Rate 100 program and portfolio budget is $3.661 million. For 2014, the 2013 Rate T2 and Rate 100 program and portfolio budget will be escalated by inflation.

c) The 2013 maximum 15% allowable overspend for Rate T1 is $0.255 million. This amount will be escalated by inflation for 2014. The 15% allowable overspend is exclusive of the $0.500 million which may be transferred to Rate T1 from Rate T2 or Rate 100 under the proposed program.

d)

Large Volume Budget	2013[1]		2014[2]	
	Rate T1	Rate 100	Rate T1	Rate 100
Program Budget	$ 3,337	$ 1,430	$ 3,411	$ 1,462
Portfolio Budget Allocation	$ 413	$ 177	$ 423	$ 181
Total Budget	**$ 3,750**	**$ 1,607**	**$ 3,834**	**$ 1,643**

[1] Inflation rate for 2013 is 2.22%.

[2] Inflation rate for 2014 for illustrative purposes is 2.22%.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Ref: Exhibit A, Tab 1, Page 16

Union outlines its proposed 2013 and 2014 Large Volume Rate T1/Rate T2/Rate 100 scorecards.

a) Please discuss if Union has presented these proposed targets to its Rate T1/Rate T2/Rate 100 customers and/or its DSM consultative. Please provide a summary of the feedback provided to Union.

b) Please discuss the rationale for moving away from an entirely cumulative natural gas savings (m3) scorecard target as found in the 2012 Large Industrial DSM Plan.

Response:

a) During the month of July, in a series of five separate meetings, Union presented the proposed program and scorecard metrics to Rate T1 and Rate 100 customers. Customers provided feedback specifically on the direct access budget mechanism and the proposed program design. Specific targets for each metric were not discussed.

Although customers did not provide detailed feedback on the proposed metrics, one stakeholder did comment on the Percentage of Customer Incentive Budget Spent metric. It was stated that they believe this metric dilutes the overall objective to drive programs that result in DSM savings.

Union presented both the scorecard metrics and targets to its DSM Consultative on August 15, 2012. The presentation from this meeting is provided at Appendix G. Union made adjustments to the scorecard based on the feedback received. A summary is provided at Appendix H.

b) The introduction of the Percentage of Customer Incentive Budget Spent metric ensures Union balances the objectives of maximizing natural gas savings with maximizing individual customer value and participation in the program.

Union is introducing a Direct Access budget mechanism for Rate T2 and Rate 100 customers to provide them with full access to the customer incentive budget they pay in rates. This program change provides increased flexibility for the customer to direct their funds toward qualifying initiatives (which includes projects that generate natural gas savings as well as studies that do not) and is designed to motivate each customer to take action with their available budget.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

Please explain the difference in the type of customer that will be in Rate T1 vs. Rate T2. In answering this question, please include the following information (separately) for the groups of customers that would fall into each new class:

a) The total number of customers;
b) The number of industrial and/or power generating customers;
c) The number of industrial customers who are members of IGUA;
d) The number of commercial (or non-industrial) customers;
e) The highest consumption (annual m3) by a single customer in 2011;
f) The lowest consumption (annual m3) by a single customer in 2011;
g) The average consumption (annual m3) per customer in 2011;

Response:

In Union's 2013 Cost of Service application (EB-2011-0210), Union has proposed to split the current Rate T1 rate class into two rate classes, a new Rate T1 mid-market service and a new Rate T2 large market service.

The proposed split of current Rate T1 will address the significant diversity in daily contract demand and firm annual consumption that currently exists between small and large customers in Rate T1. Union's proposal seeks to minimize the intra-class subsidy that exists within the rate class by recognizing the cost differences associated with the allocation of distribution demand-related and distribution customer-related costs between small and large Rate T1 customers. Union proposes to implement the new rate classes on January 1, 2013.

a) The total number of customers;
- Current Rate T1 - 59 customers
- Proposed Rate T1/ Rate T2 split (as of January 1, 2013), 39 Rate T1 customers and 20 Rate T2 customers.

b) The number of industrial and/or power generating customers;
- Current Rate T1 - 43 Industrial, 9 Power
- Proposed Rate T1/ Rate T2 split:
  - Rate T1 – 32 Industrial, 1 Power,
  - Rate T2 – 11 Industrial, 8 Power

c) Union does not have specific information on customer memberships in IGUA.

d) The number of commercial (or non-industrial) customers;

- Current Rate T1 - 5 Greenhouse, 2 Commercial
- Proposed Rate T1/ Rate T2 split:
  - Rate T1 - 5 Greenhouse, 1 Commercial
  - Rate T2 – 1 Commercial

e) Highest single Rate T1 customer consumption in 2011 – 635,849,823 m^3.

f) Lowest single Rate T1 customer consumption in 2011 – 605,911 m^3.

g) Average Rate T1 customer consumption in 2011 – 80,145,253 m^3.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

Union has proposed to treat the new T2 customers differently than the new T1 customers. Specifically, it has suggested that T1 customers be treated more like other rate classes (just an aggregate pool of DSM incentive funds, ability to access and spend an additional 15% from the DSMVA, etc.). If these customers are more like other customer classes, why treat them differently in any way (i.e. why not special rules just for the new T2 and Rate 100 customers)?

Response:

The DSM Guidelines state, "*The Board is of the view that large industrial customers possess the expertise to undertake energy efficiency programs on their own. As a result, ratepayer funded DSM programs for large industrial customers are no longer mandatory. If any are proposed, they will be considered on their merits. The Board defines large industrial gas customers as those in rate classes 100 and T1 for Union, and rate class 115 for Enbridge.*"[1] As a result, a separate T1 and Rate 100 program and scorecard were created and filed for 2012 to 2014 in EB-2011-0327.

A Settlement Agreement (EB-2011-0327) was filed on January 31, 2012 and approved on February 23, 2012. The parties to the Settlement Agreement supported the merits of the Large Industrial T1/R100 program and agreed to continue the program in 2012.

Union then took into account the interests of its customers and stakeholders by holding consultations sessions. This included two focus group meetings, five consultation meetings with customers and stakeholders, and presenting and receiving feedback on the proposed program at the August 15, 2012 DSM Consultative meeting.

In response to feedback received from Union's customers from the consultation efforts, the Direct Access budget mechanism is being introduced for Rate T2 and Rate 100. Union proposes to continue to treat new Rate T1 customers in the same manner to maintain consistency with the 2012 Settlement Agreement (EB-2011-0327). The new Rate T1 customers, however, will receive the same program offerings in 2013 as similar type customers in other rate classes.

[1] Ontario Energy Board, Demand Side Management Guidelines for Natural Gas Utilities. (EB-2008-0346). Section 8.2, Page 26.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

On p. 2, paragraph 8 of its application, the Company states: "In the event the proposed split of the current Rate T1 into two rate classes is not approved by the Board in EB- 2011-0210, the reference to Rate T2 would apply to Rate T1 customers with a minimum firm daily contracted demand of 140,870 m3." Would that capture all customers currently in Rate T1? Are there any customers in the current Rate T1 that do not have a contracted demand of at least that much? If so, please explain what would happen to those customers.

Response:

There are customers in Union's current Rate T1 that do not have a firm daily contracted demand of at least 140,870 m^3. As stated at Exhibit A, Tab 1, Page 36 in the event the proposed T2 rate structure is not approved "Rate T1 customers with a firm daily contracted demand less than 140,870 m^3 would have access to an aggregate pool customer incentive budget. This aggregate pool incentive budget would be determined based on the percent of the 100% program budget allocated in rates for aggregate pool customers (i.e. if 10% of the Large Volume program budget is recovered from these customers 10% of the $3.487 million customer incentive budget would be budgeted in the aggregate pool)".

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

What is different about new Rate T1 customers (vs. new Rate T2 and Rate 100 customers) which suggests their DSM offerings should be structured differently?

Response:

New Rate T1 customers are smaller in size (daily firm contracted demand of less than 140,870 m^3), when compared to Rate T2. The DSM offerings for Rate T1 customers are not structured differently than Rate T2 and Rate 100 customers. The difference is the Direct Access budget mechanism for Rate T2 and Rate 100 customers which is structured differently in response to customer feedback.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

For each of 2009, 2010, 2011 and 2012 (year to date), please provide the following for each group of customers who would be in the new Rate 1, the new Rate 2 and Rate 100 (please provide separately for each of the three groups/classes):

a) The number of customers that had at least one DSM project.
b) The percentage of customers that had at least one DSM project
c) The weighted average percentage (weighted by annual gas consumption) of customers that had a DSM project
d) Total incentive spending
e) Total "promotion costs" (if promotion costs were allocated, please provide the allocated amounts and explain how the allocations were made)
f) Total DSM spending (please explain any components other than incentives and promotion costs)

g) Total annual (i.e. first year) gas savings
h) Cumulative (i.e. lifetime) gas savings

Response:

The proposal to create Rate T2 has not yet been approved by the Board and if approved will be effective January 1, 2013. Any split for Rate T1 and Rate T2 for the years 2009-2012 are provided for illustrative purposes only.

a)
The number of customers that had at least one DSM project is provided in the table below.

Rate Class	2009	2010	2011	2012 YTD
Rate T1	20	21	23	10
Rate T2	7	12	12	8
Rate 100	9	14	13	6
Total	36	47	48	24

b) The percentage of customers that had at least one DSM project is provided in the table below

Rate Class	2009	2010	2011	2012 YTD
Rate T1	51%	54%	59%	26%
Rate T2	35%	60%	60%	40%
Rate 100	50%	78%	72%	33%

c) The weighted average percentage (weighted by annual gas consumption) of customers that had a DSM project is provided in the table below.

Rate Class	2009	2010	2011	2012 YTD
Rate T1	54%	58%	64%	36%
Rate T2	42%	67%	64%	40%
Rate 100	40%	93%	83%	39%

d) The total incentive expenditures are provided in the table below.

Total Incentive Expenditures ($)				
Rate Class	**2009**	**2010**	**2011**	**2012 YTD**
Rate T1	$ 481,084	$ 720,987	$ 1,226,821	$ 505,507
Rate T2	$ 635,664	$ 614,448	$ 1,865,655	$ 400,161
Rate 100	$ 784,658	$ 604,370	$ 744,592	$ 114,193
Total	**$ 1,901,406**	**$ 1,939,805**	**$ 3,837,068**	**$ 1,019,861**

e) For 2009 – 2011 promotion costs[1] were tracked at a Distribution Contract level. Union did not track promotion expenditures separately for Large Volume rate classes. In the table below Union has allocated the actual 2009 – 2011 Distribution Contract promotion costs to Rate T1, Rate T2 and Rate 100 based on the percentage of the actual Distribution Contract customer incentive paid to each group.

In 2012 Union has tracked promotion costs separately for the Rate T1/Rate 100 program. The year-to-date spend has been allocated based on the customer incentive expenditures in Exhibit B2.5 d).

[1] Include employee expenses.

Large Volume Promotion Spend												
Rate Class	2009			2010			2011			2012 YTD		
	Customer Incentive Spend [1] ($)	Customer Incentive Percentage [2] (%)	Promotion Spend [3] ($)	Customer Incentive Spend [1] ($)	Customer Incentive Percentage [2] (%)	Promotion Spend [3] ($)	Customer Incentive Spend [1] ($)	Customer Incentive Percentage [2] (%)	Promotion Spend [3] ($)	Customer Incentive Spend [1] ($)	Customer Incentive Percentage [4] (%)	Promotion Spend [5] ($)
Rate T1	$ 481,084	11%	$ 89,862	$ 720,987	15%	$ 56,419	$ 1,226,821	15%	$ 110,482	$ 505,507	50%	$ 109
Rate T2	$ 635,664	15%	$ 118,737	$ 614,448	13%	$ 48,082	$ 1,865,655	23%	$ 168,013	$ 400,161	39%	$ 86
Rate 100	$ 784,658	19%	$ 146,567	$ 604,370	13%	$ 47,294	$ 744,592	9%	$ 67,055	$ 114,193	11%	$ 25
Large Volume Total	**$ 1,901,406**	**45%**	**$ 355,166**	**$ 1,939,805**	**41%**	**$ 151,795**	**$ 3,837,068**	**48%**	**$ 345,550**	**$ 1,019,861**	**100%**	**$ 220**
Distribution Contract Total	**$ 4,231,669**		**$ 790,439**	**$ 4,688,368**		**$ 366,878**	**$ 8,014,800**		**$ 721,779**			

[1] As per Exhibit B2.5 d)

[2] Customer Incentive Percentage calculated as Rate Class Customer Incentive / Distribution Contract Total Customer Incentive Spend (as per Audited Annual Report)

[3] Promotion Spending calculated as Customer Incentive Percentage * Distibution Contract Total Promotion Spend (as per Audited Annual Report)

[4] Customer Incentive Percentage calculated as Rate Class Customer Incentive / Total Customer Incentive Spend

[5] Promotion Spending calculated as Customer Incentive Percentage * Large Volume Total Promotion Spend

f) The 2009 – 2011 total DSM spending was not tracked or reported at a program or rate class level. The "program costs" identified in the Demand Side Management Annual Report included promotion and employee expenses only. Therefore the total DSM spending for each group of customers is not available for 2009 - 2011.

Union has provided the 2012 year-to-date total DSM spending. The program promotion, technical resources, evaluation and portfolio costs have been allocated based on the percentage of the actual customer incentive paid to each group. The Low-income costs have been allocated based on distribution revenue.

2012 YTD Total DSM Spend				
DSM Item	Rate Class			
	Rate T1	Rate T2	Rate 100	Total YTD
Customer Incentive Spend [1] ($)	$ 505,507	$ 400,161	$ 114,193	$ 1,019,861
Customer Incentive Percentage [2] ($)	50%	39%	11%	
Program Promotion Spend [3] ($)	$ 109	$ 86	$ 25	$ 220
Program Technical Resources Spend [3] ($)	$ 321,379	$ 254,404	$ 72,599	$ 648,382
Program Evaluation Spend ($)	$ -	$ -	$ -	$ -
Allocated Portfolio Costs [4] ($)	$ 172,514	$ 136,563	$ 38,970	$ 348,047
Allocated Low-Income Costs [5] ($)	$ 53,855	$ 282,739	$ 84,148	$ 420,742
Total Program YTD Spend ($)	**$ 1,053,364**	**$ 1,073,953**	**$ 309,935**	**$ 2,437,252**

Notes:

[1] As per Exhibit B2.5 d).

[2] Customer Incentive Percentage for Rate T1, Rate T2 and Rate 100 is calculated as Rate Class Customer Incentive Spend / Total YTD Customer Incentive Spend.

[3] Program Promotion and Technical Resources Spend for Rate T1, Rate T2 and Rate 100 is calculated as Customer Incentive Percentage * Total YTD.

[4] Total YTD Allocated Portfolio Costs is the proportion of the actual YTD Portfolio budget spend allocated to Rate T1 and Rate 100 based on the 2012 Outlook. Rate class specific Spend is calculated as Customer Incentive Percentage * Total YTD.

[5] YTD Allocated Low-Income Costs are allocated to Rate T1 (includes Rate T2 customers) and Rate 100 based on the Distribution Revenue Outlook. Low-income costs are split between Rate T1 and Rate T2 based on Union's 2013 Cost of Service application (EB-2011-0210, Exhibit J.H-8-13-2).

g) The total annual gas savings are provided in the table below.

Total Annual Gas Savings (m^3)				
Rate Class	2009	2010	2011	2012 YTD
Rate T1	27,223,874	11,518,752	19,786,798	9,651,784
Rate T2	9,407,176	21,187,692	66,702,433	17,311,679
Rate 100	7,544,778	34,051,491	12,066,785	711,798
Total	**44,175,829**	**66,757,935**	**98,556,015**	**27,675,262**

h) The total cumulative gas savings are provided in the table below.

Total Cumulative Gas Savings (m^3)				
Rate Class	**2009**	**2010**	**2011**	**2012 YTD**
Rate T1	464,061,194	124,612,636	226,891,169	131,621,542
Rate T2	154,464,623	286,830,246	1,017,147,781	190,763,075
Rate 100	116,228,139	565,465,089	235,886,708	7,225,289
Total	**734,753,956**	**976,907,972**	**1,479,925,658**	**329,609,907**

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

For the period 2009 through 2012 (year to date), please provide the following for each group of customers who would be in the new Rate T1, the new Rate 2 and Rate 100 (please provide separately for each of the three groups/classes):

a) The number of distinct customers that had at least one DSM project.

b) The percentage of customers that had at least one DSM project.

c) The weighted average percentage (weighted by annual gas consumption) of customers that had at least one DSM project.

Response:

a) Please see the response at Exhibit B2.5a).

b) Please see the response at Exhibit B2.5b).

c) Please see the response at Exhibit B2.5c).

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

Under Union's proposal, what would happen to funds allocated to Rate T2/Rate 100 projects by August 1st of a given year that did not actually end up getting spent? What procedures does Union plan to put in place to ensure that funds are not just set aside and never used?

Response:

Any Direct Access funds that have not been earmarked by August 1st will be made available to all customers in the rate class. Union may transfer up to $0.500 million from Rate T1, Rate T2 or Rate 100 to Rate T1, Rate T2 or Rate 100 respectively. Allocated funds not spent by year-end will be credited back to the rate class and disposed through the DSMVA. Please see Exhibit B5.9b).

In an effort to ensure funds are spent:

1) Customers can earmark funds prior to August 1st to allow those customers access to incentive funds for projects with commissioning or completion between the dates of August 1st and December 31st.

2) Rate T2 / Rate 100 Percentage of Customer Incentive Budget Spend (%) Metric measures Union's ability to influence Rate T2 and Rate 100 customers to access their available funds, maximizing each customers' participation and value from the program. Funds not spend would negatively impact this metric.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

Union has proposed a performance metric of "percentage of customer incentive budget spent" for Rate T2/Rate 100 customers in order to incent Union to drive participation from each customer.

a) Why is that a better metric of participation than a count of the number of customers who have at least one project?

b) What portion of the total gas consumption by Rate T2/Rate 100 customers in 2011 was consumed by the 5 largest (in terms of consumption), 10 largest, 15 largest, 20 largest and 25 largest customers in those classes (please show separately for each increment)?

Response:

a) The Direct Access budget mechanism is designed to motivate each Rate T2 and Rate 100 customer to fully utilize their available funds by conducting studies and completing projects. A metric for the number of customers who have completed at least one project does not measure the extent to which this has occurred. Measuring the percentage of each customer's available incentive budget spent measures participation as well as the extent to which the available budget has been utilized, which also minimizes intra-rate class cross subsidization.

b) In 2011, Rate T2 did not exist.

Rate T1 Customers	Proportion of 2011 Rate Class Gas Consumed
Top 5	56 %
Top 10	76 %
Top 15	84 %
Top 20	90 %
Top 25	93 %

Rate 100 Customers	Proportion of 2011 Rate Class Gas Consumed
Top 5	73 %
Top 10	89 %
Top 15	99 %
Top 20	100%

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

In Table 4 (which summarizes the Company's scorecard for large industrial customers), the Rate T2/Rate 100 cumulative savings target is expressed as the 2012 "incentive cost-effectiveness (m3 per customer incentive dollar)" multiplied by $2.283 multiplied by 70%.

a) Is this correct? Or should the 2012 performance be multiplied by $2.283 ***million*** (and again by 70%)?

b) The Company has explained conceptually why it believes a discount on savings achieved relative to 2012 is appropriate. However, it has not provided any empirical basis for the precise size of the discount (i.e. 30%) proposed. What is the basis for 30%? Why is it more appropriate than 20% or 10%?

Response:

a) It should be multiplied by $2.283 million.

b) The 30% discount factor for 2013 is an estimate based on a qualitative assessment of Union's market experience, historical performance and factors outlined in Exhibit A, Tab 1, Section 3.1, page 18 and 19. As the Large Volume Plan incorporates a new concept with the Direct Access budget mechanism, there is no empirical evidence for the value of the discount factor.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

In Figure 1 (p. 10), Union indicates that 59% of total budget allocated to large industrial customers would be devoted to customer incentives and 15% would be devoted to "program promotion".

a) What were the comparable budgeted percentages for customer incentives and program promotion for large industrial customers in 2012?

b) To the extent that the 2012 budgeted percentages were different in 2012, what explains the differences?

c) What were the comparable actual percentages for customer incentives and program promotion for large industrials in 2011, 2010 and 2009?

Response:

Exhibit A, Tab 1, Figure 1 indicates that 2% of the budget is allocated for program promotion.

a) The 2012 budget percentages are the same as the 2013 percentages shown in Exhibit A, Tab 1, Figure 1.

b) The 2012 budget percentages are not different.

c) Union did not have a separate Large Volume program in 2011, 2010 and 2009. Accordingly, Union cannot provide actual percentages for customer incentives and program promotion on a comparable basis.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

On pp. 24-25 the Company describes five different DSM program offerings for large industrials: (1) Customer engagement – communication and education; (2) engineering feasibility and process improvement studies; (3) operation and maintenance practices; (4) new equipment and processes; and (5) energy management.

a) Are these offerings, in aggregate or individual, significantly different from what the company is offering large industrial customers in 2012? If so, how?

b) Are all of the costs associated with the first two offerings – customer engagement and engineering feasibility and process improvement studies – under the 15% of the large industrials budget described as "program promotion"? If not, what parts are included in the customer incentives portion of the budget?

c) Are all of costs associated with the last three offerings – operation and maintenance practices, new equipment and processes, and energy management – under the 59% of the large industrials budget described as customer incentives? If not, what parts are included in the "program promotion" portion of the budget?

Response:

a) No. The offerings presented are a continuation of the 2012 Large Industrial program.

b) No. Program promotion does not include all costs for specific offerings; rather it is the cost to promote the overall Large Volume DSM program. Customer engagement, engineering feasibility and process improvement studies costs are contained under the Program Customer Incentives budget. Please see Exhibit A, Tab 1, Page 12 of 36 for Table 2: 2012 - 2014 Large Volume Rate T1 / Rate T2 / Rate 100 Program Budget.

c) No. The 59% includes only customer incentive costs. Program promotion costs are in addition to this and represent 2% of the costs in Exhibit A, Tab 1, Page 10 of 36, Figure 1. Program promotion is not broken down into costs for specific offerings; rather it is the cost to promote the overall Large Volume DSM program.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

Table 5 (p. 20) shows that the "percentage of customer incentive funded in rates received" has been growing steadily – roughly doubling between 2008 and 2011 (from 25% to 49%). Why? What explains this constant and significant growth?

Response:

In 2008, many customers did not participate in Union's DSM program. Of the customers who conducted projects, some received a higher amount of customer incentive relative to the amount they individually funded in rates based on the methodology used for Table 5[1]. For the purposes of calculating the average for the year these percentages are then capped at 100% on an individual customer basis. Therefore, although their calculated percentage is large these customers do not contribute a large increase to the average percentage for the year.

In contrast, in 2011 there was broader participation and customers received incentives that were more closely aligned with the amount they funded in rates based on the methodology used for Table 5[1]. These factors resulted in a higher average percentage in 2011 relative to 2008.

Please also see Exhibit B6.8 b).

[1] The methodology Union used is provided in Exhibit A, Tab 1, page 20, line 3 – 8. It does not reflect the annual DSM amount funded in each customer's rates.

UNION GAS LIMITED

Answer to Interrogatory from
Green Energy Coalition ("GEC")

Table 1 shows the number of DSM projects completed annually from 2008 to 2011.

a) What portion of the projects were studies, what portion were capital projects, and what portion were O&M projects?

b) What portion of the savings came from studies, capital and O&M projects (please show separately for each)?

Response:

a)

	Number of Projects				% Distribution		
Year	Capital	O&M	Study	Total	Capital	O&M	Study
2008	16	31	47	94	17%	33%	50%
2009	29	45	50	124	23%	36%	40%
2010	27	53	51	131	21%	40%	39%
2011	43	157	72	272	16%	58%	26%

b)

Year	Capital Cumulative m^3	O&M Cumulative m^3	Total Cumulative m^3	% Savings Equipment	% Savings O&M	% Savings Studies*
2008	160,236,863	310,665,052	470,901,915	34%	66%	0%
2009	507,085,757	177,691,466	684,777,223	74%	26%	0%
2010	607,512,366	374,423,911	981,936,277	62%	38%	0%
2011	343,434,865	1,135,407,505	1,480,322,692	23%	77%	0%

*Studies are completed to identify potential savings and support the completion of O&M and capital projects. Studies themselves do not generate savings.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit A, Tab 1, Schedule 1

Please confirm that there will be no impact on the rates paid by customers in all rate classes other than Rates T1, T2 and 100 in 2013 or 2014 as a result of the proposed Large Volume DSM Plan, including any impacts related to the budget, LRAM or incentive payments. If this cannot be confirmed, please show the maximum potential impact by rate class on the other rate classes.

Response:

Confirmed.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit A, Tab 1

Will any of the Large Volume DSM Plan programs result in a reduction in the peak day demands associated with the T1, T2 and/or Rate 100 customers? If yes, please provide a forecast of the reduction in the peak day demands that might result in both 2013 and 2014 and beyond.

Response:

Union's Large Volume DSM Plan may or may not result in a reduction in peak day demands for Rate T1, Rate T2 or Rate 100 customers. Peak day demands are influenced by a number of factors including the economy, production levels, new plant additions, adopting new technology etc. Union does not have a forecast of the impact of its large volume DSM program on peak day demand.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit A, Tab 1, Appendix A

a) With respect to the self-direct program, the evidence states that most jurisdictions a threshold, typically based on demand, is set and customers then enroll in the program. For each of the jurisdictions, please provide the threshold and indicate whether the threshold is based on demand, annual volumes or some other criteria.

b) Based on the response in part (a) for each jurisdiction, please indicate which rate classes would qualify for the self-direct program.

Response:

a) The table below outlines the threshold requirements for the jurisdictions reviewed by Union.

Jurisdiction	Threshold	Threshold Basis
Oregon	Greater than 1 aMW	Annual Usage
Washington	3aMW	Annual Usage
Minnesota	20 MW	Demand
Minnesota	500,000 MCF[1]	Consumption
Wisconsin	1,000 kW (per month) and billed at least $60,000 for electric services	Demand
Wisconsin	10,000 Dth[2] billed at least $60,000 for natural gas services	Demand
Vermont	Contribute at least $5,000 in Energy Efficiency Charge fees	Annual Contribution
Montana	Greater than 1 MW	Demand
Arizona	Aggregate of 40 million kWh/year	Consumption
New Jersey	400 kW annual	Demand
Colorado	Greater than 2 MW/10 GWh	Demand/Consumption
New Mexico	Greater than 2 MW/10 GWh	Demand/Consumption

[1] 1 cubic meter is approximately 35.3 cubic feet
[2] 1 cubic meter is approximately 0.36 therms

Michigan	1 MW annual or 5 MW (aggregate among multiple facilities)	Demand
Utah	1MW/5,000 mWh	Demand/Consumption
Wyoming	1MW/5,000 mWh	Demand/Consumption
Ohio	700,000 kWh	Consumption

Jurisdictions such as Idaho and Massachusetts noted that a threshold exists, however a numerical value associated with the threshold was not included in the information gathered by Union.

b) Union's review of secondary sources determined the majority of jurisdictions require customers to meet a threshold to be eligible for self-direct or opt-out. The majority of these jurisdictions have thresholds associated with electricity. To Union's knowledge Minnesota and Wisconsin are the only jurisdictions that require a threshold to qualify for a natural gas self-direct program.

Based on the information provided in part a), Union's rate classes that would qualify for Minnesota's self-direct program would be Rate 20 and Rate T1. The rate classes that would qualify for Wisconsin's self-direct program would be Rate 20, Rate 100, Rate M7 and Rate T1.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Ref: Exhibit A, Tab 1, pages 31-36

If the Board were to approve an opt-out provision for rates T1, T2 and 100, would there be any impediment to extending an opt-out provision to contract customers in other rate classes? If yes, please explain.

Response:

Yes, should the Board approve an opt-out provision for Rate T1, Rate T2 and Rate 100, there are impediments to extending that provision to contract customers in any rate class.

In Union's view, the Board's DSM Guidelines established in EB-2008-0346 do not consider the provision of DSM programs for contract customers in any rate classes to be discretionary in nature. Union's 2012 - 2014 DSM Plan, which was approved by the Board in the EB-2011-0327 Settlement Agreement, specifically includes Resource Acquisition Programs for contract customers in other rate classes. The EB-2011-0327 Settlement Agreement did not contemplate an opt-out provision for customers.

As Union has not proposed an opt-out provision as part of its 2013 – 2014 DSM Plan for Large Volume customers, Union has not fully considered the administrative requirements associated with an opt-out provision. However, it is Union's expectation that any opt-out provision for Rate T1, Rate T2 and Rate 100 or for contract customers in other rate classes would cause significant administrative costs related to customer tracking, staffing and billing to be incurred.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada Energy Ltd. ("TCE")

Reference: a) Exhibit A, Tab 1, Page 6 Line 24
b) Exhibit A, Tab 1, Table 3 Page 13

Preamble: On page 6 line 24, Union notes that the 2012 DSM budget is 4.664 M$.
In table 3 page 13, Union provides some detail of the source of the Total DSM amounts allocated to rate T1 and T2 for the years 2012 to 2014.

a) For each column of table 3, starting from the amount indicated at the line labeled "Total DSM Portfolio Budget Post-Inflation", please provide the detail of the calculations that produce the number located at line (d).

b) In this process please explain for the year 2012 how the DSM budget amount of 3.412 M$ shown at line (a) becomes 4.664 M$ at line d).

c) Please detail the same information for the years 2013 and 2014.

Response:

a) Please see Table 2 (Exhibit A, Tab 1, Page 12).

b) The amount shown at line (a) of $3.412 million is the Total DSM Portfolio Budget Post-Inflation for all DSM programs. This value is separate from the Large Volume Rate T1/Rate T2/Rate 100 Program Budget of $4.664 million at line (d).

The DSM Portfolio Budget Post-Inflation includes the costs for Research, Evaluation and Administration that cannot be assigned to individual programs and are therefore accounted at the portfolio level. 16.9% (line (b)) of these costs are allocated to the Large Volume rate payers. The resulting portfolio budget allocation of $0.578 million is displayed at line (c). This value is added to the Large Volume program budget of $4.664 million (line (d)) to calculate the Total Large Volume Program and Allocated Portfolio Budget for 2012 of $5.241 at line (e).

c) Please see b) above.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada Energy Ltd. ("TCE")

Reference: a) Exhibit A, Tab 1, Table 2 Page 12
b) Exhibit A, Tab 1, Table 3 Page 13

Preamble: Table 2 and Table 3 both have a line which is labeled "cumulative inflation". The numbers for inflation provided in those two tables are different.

a) Please explain the relation, if any, between those two lines.

b) Please provide the detail of the calculations that produces the amounts indicated in the "cumulative inflation" lines of those two tables.

Response:

a) The inflation rates used in Table 1 and Table 2 are 2.87% for 2012 and 2.22% for 2013 and 2014. Table 2 displays the cumulative inflation for the Large Volume Program Budget whereas Table 3 displays the cumulative inflation for the Total DSM Portfolio Budget.

b) In Table 2, the cumulative inflation is calculated as follows:

2012 Cumulative Inflation
2012 Large Volume DSM Program Budget ($3.487 million + $0.100 million + $0.907 million + $0.040 million = $4.534 million) * 2.87% = $0.130 million

2013 Cumulative Inflation
2012 Total Large Volume DSM Program Budget ($4.664 million) * 2.22% + 2012 Cumulative Inflation ($0.130 million) = $0.234 million

2014 Cumulative Inflation
2013 Total Large Volume Program Budget ($4.767 million) * 2.22% + 2013 Cumulative Inflation ($0.234 million) = $0.339 million

In Table 3, the cumulative inflation is calculated as follows:

2012 Cumulative Inflation
2012 Total DSM Portfolio Budget Pre-Inflation ($3.317 million) * 2.87% = $0.095 million

2013 Cumulative Inflation

2012 Total DSM Portfolio Budget Post-Inflation ($3.412 million) * 2.22% + 2012 Cumulative Inflation ($0.095 million) = $0.171 million

2014 Cumulative Inflation
2013 Total DSM Portfolio Budget Post-Inflation ($3.488 million) * 2.22% + 2013 Cumulative Inflation ($0.171 million) = $0.248 million

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada Energy Ltd. ("TCE")

Reference: Exhibit A, Tab 1, Page 17, Lines 5 to 7

Preamble: At lines 5 to 7, Union explains how it intends to calculate its Rate T2/rate 100 Percentage of Customer Incentive Budget Spent (%).

Please provide a thorough conceptual example of the Rate T2/Rate 100 Percentage of Customer Incentive Budge Spent (%) metric calculation.

Response:

An example of the Rate T2/Rate 100 Percentage of Customer Incentive Budget Spent (%) metric calculation is provided below.

Assumptions:

- 5 customers in Rate T2 and 5 customers in Rate 100
- $0.500 million customer incentive budget for Rate T2 and $0.500 million customer incentive budget for Rate 100

Rate T2 Customers	Customer Incentive in 2013 Rates	Direct Access Customer Incentive Budget Available for 2013	Customer Incentive Budget Spent	Customer Incentive Budget Spent / Customer Incentive Budget Available (Calculated %)	Customer Incentive Budget Spent / Customer Incentive Budget Available (Capped at 100%)
	(a)	(b) = (a)	(c)	(d) = (c)/(b)	(e) = (d) capped at 100%
Customer A	$0.100	$0.100	$0.100	100%	100%
Customer B	$0.050	$0.050	$0.100	200%	100%
Customer C	$0.150	$0.150	$0.200	133%	100%
Customer D	$0.025	$0.025	$0.000	0%	0%
Customer E	$0.175	$0.175	$0.100	57%	57%
Total	**$0.500**	**$0.500**	**$0.500**		**71%**

Rate 100 Customers	Customer Incentive in 2013 Rates	Direct Access Customer Incentive Budget Available for 2013	Customer Incentive Budget Spent	Customer Incentive Budget Spent / Customer Incentive Budget Available (Calculated %)	Customer Incentive Budget Spent / Customer Incentive Budget Available (Capped at 100%)
	(a)	(b) = (a)	(c)	(d) = (c)/(b)	(e) = (d) capped at 100%
Customer F	$0.050	$0.050	$0.200	400%	100%
Customer G	$0.125	$0.125	$0.080	64%	64%
Customer H	$0.200	$0.200	$0.050	25%	25%
Customer I	$0.050	$0.050	$0.030	60%	60%
Customer J	$0.075	$0.075	$0.100	133%	100%
Total	**$0.500**	**$0.500**	**$0.460**		**70%**

Rate T2 / Rate 100 Percentage of Customer Incentive Budget Spent Metric Achievement Average = [(e) for Customer A + Customer B ….. + Customer J] / 10	**71%**

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada Energy Ltd. ("TCE")

Reference: a) Exhibit A, Tab 1, Page 29, Lines 3 to 5

Preamble: *"By April 1st, customers are required to submit an Energy-Efficiency Plan, authored with the assistance of Union Gas' energy experts. An incentive will be provide to the customer once their Energy-Efficiency Plan has be confirmed by Union Gas."* (Emphasis Added)

a) Please explain the nature of the incentive referred to at Line 4 of the reference.

b) Please provide the amount of the incentive provided if it is a monetary incentive.

c) According to your answer in b) above, please explain how the amount of the incentive is determined.

d) Please detail the criteria that Union will use in order to "confirm" the submitted Energy-Efficiency Plan.

Response:

a) The Energy-Efficiency Plan incentive is to promote the initial identification and scoping of potential energy saving projects at each Direct Access customer's site. The incentive is to assist the customer with the time and resources required for the plan, and to promote the importance of customer participation to receive benefits from Union's DSM program.

b) Based on the Large Volume DSM Plan proposed, the monetary incentive would be in the range of 5% to 10% of a customer's direct access incentive budget.

c) The incentive percentage was determined based on Union's experience delivering planning and awareness initiatives. The range outlined in Exhibit B4.4b) is sufficient to drive attention to complete the Energy Efficiency Plan with adequate budget remaining to support the completion of projects which drive m3 savings and studies.

d) The Energy-Efficiency Plan will be completed with Union Gas' technical and account resources. Confirmation will take place once the customer and Union Gas have identified potential avenues for incentive funding support and associated implementation timing.

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada Energy Ltd. ("TCE")

Reference: Exhibit A, Tab 1, Schedule 2, Column F
Exhibit A, Tab 1, Schedule 1, Column J
EB-2011-0210, Schedule H3, Tab 1; Schedule 2, Page 4, dated November 11, 2011
EB-2011-0210, Schedule H3, Tab 1; Schedule 2 Page 8, dated November 11, 2011

Preamble: Reference a) presents the rate impact of the total DSM budget for rate 100, T1 and proposed T1-T2 through the use of an average rate.
TCE understands from reference b) that the DSM budget for rate R100 and T1 excluding the Low Income allocation is 5.359 M$.
TCE wishes to see the impact on the different components of the rate schedule, excluding the Low Income allocation.
TCE also wishes to see the distribution of the increase in annual cost on the customers of rate 100, T1 and new T1-T2.

a) Please present the impact of the DSM program cost excluding Low Income allocation (5.359 M$) on the rate schedule of the rate R100, T1 and new T1-T2 using the format shown in reference c) and d) above. For that purpose, please isolate the DSM budget component impact on each element of the rate schedule.

b) Please provide a chart that shows the distribution of the yearly cost increase, in dollars and in percentage, caused by the inclusion in the rate schedule of the DSM budget excluding Low Income allocation (5.359 M$), on the customers of the R100, T1 and new T1-T2 rate class. Please choose the grouping of the distribution in order to provide meaningful classes.

Response:

a) Please refer to Attachment 1.

b) Please refer to Attachment 2.

Updated: 2012-07-13
EB-2011-0210
Exhibit H3
Tab 1
Schedule 2
Page 4 of 11

UNION GAS LIMITED
Northern & Eastern Operations Area
In-Franchise Customers
Effective January 1, 2013

Line No.	Particulars	Billing Units	2013 Forecast Usage (1)	Current Approved Revenue ($000's)	Current Approved Rates (2) (cents / m^3)	Revenue (Deficiency) / Sufficiency ($000's)	Proposed 2013 Revenue Requirement (3) ($000's)	Proposed 2013 Revenue (Deficiency) / Sufficiency ($000's)	DSM Program Cost excl. Low Income ($000's)	Revenue excluding DSM ($000's)	Total Revenue ($000's)	DSM Program Rate excl. Low Income (cents / m^3)	Rate Excluding DSM (cents / m^3)	Total Rate (cents / m^3)	Revenue to Cost Ratios	Rate Change (%)
			(a)	(b)	(c)	(d) = (b - e)	(e)	(f)			(g) = (e + f)			(h) = (g / a)	(i) = (g / e)	(j) = (h - c) / (c)
	Rate 25 - Large Volume Interruptible Service															
1	Monthly Charge	bills	842	160	$189.51	(2,860)	3,020	(2,704)	-	316	316	-	$375.00	$375.00	0.105	
2	Monthly Delivery Charge	10^3m^3	129,481	2,170	1.6759	(1,508)	3,678	(1,013)	-	2,664	2,664	-	2.0578	2.0578		
3	Transportation Account Charge	bills	36	8	$219.43	-	8	-	-	8	8	-	$219.43	$219.43		
4	Total Delivery - 25		129,481	2,337	1.8052	(4,368)	6,705	(3,717)	-	2,988	2,988	-	2.3077	2.3077	0.446	27.8%
5	Gas Supply Transportation	10^3m^3	42,913	1,685	3.9269	(433)	2,118	-	-	2,118	2,118	-	4.9352	4.9352		
6	Gas Supply Commodity (4)	10^3m^3	42,913	6,879	16.0304	943	5,936	943	-	6,879	6,879	-	16.0304	16.0304		
7	Gas Supply Administration Charge	10^3m^3	42,913	135	0.3138	50	85	-	-	85	85	-	0.1981	0.1981		
8	Total Rate 25		129,481	11,036	-	(3,808)	14,844	(2,774)	-	12,070	12,070	-	-	-	-	-
	Rate 100 - Large Volume Firm Service															
9	Monthly Charge	bills	226	176	$777.97	(843)	1,019	(680)	-	339	339	-	$1,500.00	$1,500.00	0.333	
10	Demand	$10^3m^3/d$	71,975	8,611	11.9642	(6,646)	15,258	(3,814)	1,205	10,238	11,443	1.6749	14.2240	15.8989		
11	Commodity	10^3m^3	1,895,488	3,821	0.2016	3,821	-	4,495	402	4,093	4,495	0.0212	0.2159	0.2371		
12	Delivery (Commodity/Demand)		1,895,488	12,433	0.6559	(2,825)	15,258	680	1,607	14,330	15,938	-	-	0.8408		
13	Transportation Account Charge	bills	226	50	$219.43	-	50	-	-	50	50	-	$219.43	$219.43		
14	Total Delivery - 100		1,895,488	12,658	0.6678	(3,668)	16,326	0	1,607	14,719	16,326	-	-	0.8613	1.000	29.0%
	Gas Supply Demand Charge															
15	Fort Frances	$10^3m^3/d$	-	-	63.7749	-	-	-	-	-	-	-	50.7508	50.7508		
16	Western	$10^3m^3/d$	-	-	70.5057	-	-	-	-	-	-	-	62.1587	62.1587		
17	Northern	$10^3m^3/d$	-	-	98.2553	-	-	-	-	-	-	-	96.1199	96.1199		
18	Eastern	$10^3m^3/d$	-	-	121.5703	-	-	-	-	-	-	-	125.1227	125.1227		
	Commodity Transportation 1															
19	Fort Frances	-	-	-	5.8480	-	-	-	-	-	-	-	5.2627	5.2627		
20	Western	10^3m^3	-	-	5.9416	-	-	-	-	-	-	-	5.4228	5.4228		
21	Northern	10^3m^3	-	-	6.3533	-	-	-	-	-	-	-	5.9222	5.9222		
22	Eastern	10^3m^3	-	-	6.6993	-	-	-	-	-	-	-	6.3488	6.3488		
	Commodity Transportation 2															
23	Fort Frances	-	-	-	0.1258	-	-	-	-	-	-	-	0.1260	0.1260		
24	Western	10^3m^3	-	-	0.1234	-	-	-	-	-	-	-	0.1236	0.1236		
25	Northern	10^3m^3	-	-	0.1930	-	-	-	-	-	-	-	0.1933	0.1933		
26	Eastern	10^3m^3	-	-	0.2528	-	-	-	-	-	-	-	0.2533	0.2533		
27	Gas Supply Transportation - 100		-	-	-	-	-	-	-	-	-	-	-	-		
	Storage (GJ)															
28	Demand	GJ/d	15,600	174	11.125	68	106	8	-	113	113	-	7.261	7.261		
29	Commodity	GJ	100,000	24	0.239	11	13	3	-	15	15	-	0.155	0.155		
30	Gas Supply - 100		100,000	197	-	79	118	10	-	129	129	-	-	-		
31	Total Rate 100		1,895,488	12,855	-	(3,589)	16,445	11	1,607	14,848	16,455	-	-	-	-	-

Notes:
(1) EB-2011-0210, Exhibit C3, Tab 2, Schedule 1, Column (b).
(2) EB-2010-0359, Appendix A effective January 1, 2011 (Excludes Price Adjustments).
(3) EB-2011-0210, Exhibit G3, Tab 2, Schedules 2-21, excludes Other Revenue.
(4) Gas Supply Commodity and Fuel Rates will be updated as part of the Board-approved QRAM process.

Updated: 2012-07-13
EB-2011-0210
Exhibit H3
Tab 1
Schedule 2
Page 8 of 11

UNION GAS LIMITED
Southern Operations Area
In-Franchise Customers
Effective January 1, 2013

Line No.	Particulars	Billing Units	2013 Forecast Usage (1)	Current Approved		Revenue (Deficiency) / Sufficiency	Proposed 2013									
				Revenue ($000's)	Rates (2) (cents / m^3)	($000's)	Revenue Requirement (3) ($000's)	Revenue (Deficiency) / Sufficiency ($000's)	DSM Program Cost excl. Low Income ($000's)	Revenue excluding DSM ($000's)	Revenue ($000's)	DSM Program Rate excl. Low Income (cents / m^3)	Rate Excluding DSM (cents / m^3)	Rates (cents / m^3)	Revenue to Cost Ratios	Rate Change (%)
			(a)	(b)	(c)	(d) = (b - e)	(e)	(f)			(g) = (e + f)			(h) = (g / a)	(i) = (g / e)	(j) = (h - c) / (c)
	Rate T1 - Storage and Transportation Rate															
	Storage ($/GJ)															
	Demand:															
	Firm injection / withdrawal															
1	Union provides deliverability inventory	GJ/d/mo.	2,009,280	3,078	1.532	171	2,908	412	-	3,319	3,319	-	1.652	1.652		
2	Customer provides deliverability inventory	GJ/d/mo.	1,503,356	1,527	1.016	85	1,443	436	-	1,879	1,879	-	1.250	1.250		
3	Incremental firm injection right	GJ/d/mo.	-	-	1.016	-	-	-	-	-	-	-	1.250	1.250		
4	Interruptible	GJ/d/mo.	477,948	486	1.016	486	-	597	-	597	597	-	1.250	1.250		
5	Space	GJ/d/mo.	129,041,736	1,290	0.010	(240)	1,530	7	-	1,537	1,537	-	0.012	0.012		
6	Commodity (Customer Provides)	GJ	10,620,082	74	0.007	(3)	78	2	-	79	79	-	0.007	0.007		
7	Commodity (Union Provides)	GJ	-	-	0.039	-	-	-	-	-	-	-	0.027	0.027		
8	Customer supplied fuel	GJ	63,503	341	-	135	206	-	-	206	206	-	-	-		
	Transportation (cents/ m^3)															
	Demand															
9	First 140,870 m^3	10^3m^3/d/mo.	71,774	13,701	19.0898	314	13,387	(561)	1,127	11,699	12,826	1.5701	16.3003	17.8705		
10	All Over 140,870 m^3	10^3m^3/d/mo.	167,088	21,796	13.0445	500	21,296	(892)	2,623	17,780	20,404	1.5701	10.6412	12.2113		
	Commodity															
	Firm															
11	First 2,360,653 m^3	10^3m^3	1,241,155	2,278	0.1835	1,989	288	-	-	288	288	-	0.0232	0.0232		
12	All Over 2,360,653 m^3	10^3m^3	3,502,055	3,197	0.0913	2,793	405	-	-	405	405	-	0.0116	0.0116		
13	Interruptible	10^3m^3	421,771	2,959	0.7014	(1,348)	4,306	-	-	4,306	4,306	-	1.0210	1.0210		
14	Monthly Charge	Meter/mo.	972	1,745	$1,795.31	(4,671)	6,416	-	-	6,416	6,416	-	$6,600.83	$6,600.83	1.000	
15	Customer supplied fuel	10^3m^3	26,210	5,310	202.610	3,301	2,009	-	-	2,009	2,009	-	-	-		
16	Total Rate T1		5,164,982	57,783	1.1187	3,511	54,272	0	3,750	50,522	54,272	-	-	1.0508	1.000	-6.1%
	Rate T3 - Storage and Transportation Rate															
	Storage ($/GJ)															
	Demand															
	Firm injection / withdrawal															
17	Union provides deliverability inventory	GJ/d/mo.	-	-	1.532	-	-	-	-	-	-	-	1.652	1.652		
18	Customer provides deliverability inventory	GJ/d/mo.	679,320	690	1.016	(156)	846	3	-	849	849	-	1.250	1.250		
19	Incremental firm injection right	GJ/d/mo.	-	-	1.016	-	-	-	-	-	-	-	1.250	1.250		
20	Interruptible	GJ/d/mo.	-	-	1.016	-	-	-	-	-	-	-	1.250	1.250		
21	Space	GJ/d/mo.	36,614,256	366	0.010	(70)	436	(0)	-	436	436	-	0.012	0.012		
22	Commodity (Customer Provides)	GJ	4,459,672	31	0.007	(2)	33	1	-	33	33	-	0.007	0.007		
23	Commodity (Union Provides)	GJ	-	-	0.039	-	-	-	-	-	-	-	0.027	0.027		
24	Customer supplied fuel	GJ	26,668	143	-	57	87	-	-	87	87	-	-	-		
	Transportation (cents/ m^3)															
25	Demand	10^3m^3/d/mo.	28,200	2,544	9.0218	(461)	3,005	(183)	-	2,822	2,822	-	10.0067	10.0067		
26	Commodity	10^3m^3	272,712	186	0.0682	156	30	-	-	30	30	-	0.0110	0.0110		
27	Monthly Charge	Meter/mo.	12	211	$17,567.33	(49)	260	-	-	260	260	-	$21,660.91	$21,660.91	1.000	
28	Customer supplied fuel	10^3m^3	1,972	399	202.610	254	146	-	-	146	146	-	-	-		
29	Total Rate T3		272,712	4,571	1.6762	(271)	4,843	(180)	-	4,662	4,662	-	-	1.7097	0.963	2.0%

Notes:
(1) EB-2011-0210, Exhibit C3, Tab 2, Schedule 1, Column (b).
(2) EB-2010-0359, Appendix A effective January 1, 2011 (Excludes Price Adjustments).
(3) EB-2011-0210 , Exhibit G3, Tab 2, Schedules 2-21, excludes Other Revenue.

UNION GAS LIMITED
Rate T1 Firm Transportation Redesign based on 2013 Revenue Requirement
Revenue Proof for Proposed Rate T1 and Rate T2

Line No.	Particulars	Annual Billing Units	DSM Program Rate excl. Low Income (cents / m^3)	Rate Excluding DSM (cents / m^3)	Rates (cents/m^3)	DSM Program Cost excl. Low Income ($000's)	Revenue Excluding DSM ($000's)	Total Revenue ($000's)	Revenue Requirement ($000's)	Revenue to Cost Ratio
		(a)			(b)			(c)	(d)	(e) = (c / d)
	Rate T1 with Current Rate Design									
	2013 Proposed Current Rate T1 Firm Transportation (1)									
1	Monthly Charge	972	-	$6,600.83	$6,600.83	-	6,416	6,416	6,416	1.000
	Firm Transportation Demand (10^3m^3/day/month)									
2	First 140,870 m^3 per month	71,774	1.5701	16.3003	17.8705	1,127	11,699	12,826		
3	All Over 140,870 m^3 per month	167,088	1.5701	10.6412	12.2113	2,623	17,780	20,404		
4	Total Firm Transportation Demand	238,861				3,750	29,479	33,230	34,683	0.958
	Firm Transportation Commodity (10^3m^3)									
5	First 2,360,653 m^3 per month	1,241,155	-	0.0232	0.0232	-	288	288		
6	All Over 2,360,653 m^3 per month	3,502,055	-	0.0116	0.0116	-	405	405		
7	Total Firm Transportation Commodity	4,743,211				-	693	693	693	1.000
8	Total 2013 Proposed Current Rate T1 Firm Transportation	4,743,211						40,339	41,793	0.965
	Proposed Rate T1 and Rate T2 Redesign									
	2013 Proposed Rate T1 Firm Transportation Redesign									
9	Monthly Charge	528	-	$2,001.29	$2,001.29	-	1,057	1,057	1,057	1.000
	Firm Transportation Demand (10^3m^3/day/month)									
10	First 28,150 m^3 per month	12,448	6.6678	24.8717	31.5395	830	3,096	3,926		
11	Next 112,720 m^3 per month	13,002	6.6678	16.6066	23.2744	867	2,159	3,026		
12	Total Firm Transportation Demand	25,450				1,697	5,255	6,952	8,406	0.827
	Firm Transportation Commodity (10^3m^3)									
13	All Volumes	485,700	-	0.0715	0.0715	-	347	347	347	1.000
14	Total 2013 Proposed Rate T1 Firm Transportation Redesign	485,700						8,356	9,810	0.852
	2013 Proposed Rate T2 Firm Transportation Redesign									
15	Monthly Charge	444	-	$6,000.00	$6,000.00	-	2,664	2,664	5,360	0.497
	Firm Transportation Demand (10^3m^3/day/month)									
16	First 140,870 m^3 per month	46,323	0.9622	20.7410	21.7032	446	9,608	10,054		
17	All Over 140,870 m^3 per month	167,088	0.9622	10.3610	11.3232	1,608	17,312	18,920		
18	Total Firm Transportation Demand	213,411				2,053	26,920	28,973	26,277	1.103
	Firm Transportation Commodity (10^3m^3)									
19	All Volumes	4,257,511	-	0.0081	0.0081	-	345	345	345	1.000
20	Total 2013 Proposed Rate T2 Firm Transportation Redesign	4,257,511						31,983	31,983	1.000
21	Grand Total 2013 Proposed Rate T1 and Rate T2 Redesign	4,743,211						40,339	41,793	0.965

Notes:
(1) EB-2011-0210, Exhibit H3, Tab 1, Schedule 2, Page 8.

UNION GAS LIMITED
DSM Costs and Unit Rates - 2012 Approved & 2013 Proposed

Line No.	Particulars	2012 Approved DSM Costs ($000's) (a)	2012 Approved Billing Units (10^3m^3) (b)	2012 Approved Unit Rate (cents/m^3) (c) = (a/b)	2013 Proposed DSM Costs ($000's) (d)	2013 Proposed Billing Units (10^3m^3) (e)	2013 Proposed Unit Rate (cents/m^3) (f) = (d/e)	Variance ($000's) (g) = (d-a)	Variance (%) (h) = (g/a)
	Rate 100								
1	Demand	-	93,386	-	1,205	71,975	1.6749		
2	Commodity	1,572	2,219,052	0.0709	402	1,895,488	0.0212		
3	Total	1,572			1,607			35	2.2%
	Rate T1 (Current)								
4	Demand	-	191,369	-	3,750	238,861	1.5701		
5	Commodity	3,669	4,794,769	0.0765	-	5,164,982	-		
6	Total	3,669			3,750			81	2.2%
7	Total (line 3 + line 6)	5,241			5,358			116	2.2%
	Proposed T1 & T2 Split								
	Rate T1 (2013 Proposed)								
8	Demand				1,697	25,450	6.6678		
	Rate T2 (2013 Proposed)								
9	Demand				2,053	213,411	0.9622		

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada Energy Ltd. ("TCE")

Reference:

a) Exhibit A, Tab 1, Page 7, Lines 9 to 12
"Union is proposing to change the customer incentive budget process for Rate T2 and Rate 100 customers to a new Direct Access budget mechanism. Instead of an aggregate pool approach, at the beginning of the year these customers will each have direct access to the full customer incentive budget they pay in rates." (Emphasis Added).

b) Exhibit A Tab 1 Page 7, Lines 17 to 20
"[…] Rate T2 and Rate 100 customers will have enhanced flexibility to access a greater level of incentives for individual large projects or studies. They will know their dedicated amount of customer incentive budget for the program year." (Emphasis Added)

c) Exhibit A Tab 1 Page 28, Lines 5 to 7
"Each Rate T2 and Rate 100 customer will have dedicated access to the customer incentive budget they pay in their rates. Under this model, these customers will know exactly how much funding they have available for each program year." (Emphasis Added)

a) Define how each customer's direct access incentive fund is calculated and provide and example using their respective rate schedule.

b) Explain how each customer will get to know how much funding they have available for themselves if the impact of the DSM budget components of their respective rate schedule is not isolated.

c) Please confirm, if the answers to Interrogatory 5 b) also provides the distribution of the customer's direct access incentive funds, and if not, please explain the difference.

Response:

a) Please see Attachment 1 for the unit rate recovery of 2013 DSM program costs for Rate 100 and Rate T2.

The direct access DSM incentive amount for Rate T2 customers will be determined for each customer at the beginning of each year and will be an amount equal to approximately 68% of the DSM program costs (excluding Low-income) recovered in Rate T2 transportation demand charges.

Example: Rate T2 Direct Access Incentive Amount for 2013 (excluding Low-income)

Line No.	Proposed Rate T2		
1	Monthly Firm Transportation Demand (10^3m^3/day)	950	
2	Annual Firm Transportation Demand (10^3m^3/day)	11,400	(1)
3	DSM Demand Unit Rate (cents/m^3)	0.9622	(2)
4	Total DSM Paid in Rates ($)	109,691	(3)
5	Direct Access Factor	0.6844	
6	Total Direct Access Amount ($)	75,072	(4)

Notes:

(1) Line 1 x 12 months.
(2) Please see Attachment 1 for the calculation of the DSM Demand Unit Rate.
(3) Line 2 x Line 3 x 10, Low-income costs not included.
(4) Line 4 x Line 5.

The direct access DSM incentive amount for Rate100 customers will be determined for each customer at the beginning of each year and will be an amount equal to approximately 68% of the DSM program costs (excluding Low-income) recovered in Rate 100 demand and commodity charges. Approximately 75% of the DSM program costs are recovered in Rate 100 demand charges, with the remaining 25% recovered in commodity charges.

Example: Rate R100 Direct Access Incentive Amount for 2013 (excluding Low-income)

Line No.	Rate 100		
1	Monthly Firm Delivery Demand (10^3m^3/day)	200	
2	Annual Firm Delivery Demand (10^3m^3/day)	2,400	(1)
3	DSM Demand Unit Rate (cents/m^3)	1.6749	(2)
4	Total DSM Demand Paid in Rates ($)	40,198	(3)
5	Annual Consumption (m^3)	64,650,000	
6	DSM Commodity Unit Rate (cents/m^3)	0.0212	(4)
7	Total DSM Commodity Paid in Rates ($)	13,706	(5)
8	Total DSM Paid in Rates ($)	53,903	(6)
9	Direct Access Factor	0.6844	
10	Total Direct Access Amount ($)	36,891	(7)

Notes:

(1) Line 1 x 12 months.
(2) Please see Attachment 1 for the calculation of the DSM Demand Unit Rate.
(3) Line 2 x Line 3 x 10.
(4) Please see Attachment 1 for the calculation of the DSM Commodity Unit Rate.
(5) (Line 5 x Line 6) /100.
(6) Line 4 + Line 7, Low-income costs not included.
(7) Line 8 x Line 9.

b) At the beginning of each year Union will communicate the incentive amount to each Rate T2 and Rate 100 customer. Please see above for how the incentive amount will be calculated.

c) The response to B4.5 b) does not provide the distribution of the customer's direct access incentive funds. Please see a) above for the formulae by which each Large Volume customer's, Direct Access incentive fund will be calculated and an example of calculating the Direct Access Incentive amount.

UNION GAS LIMITED
Recovery of 2013 DSM Program Costs in Demand and Commodity Rates
for Rate 100 and Proposed Rate T2

Line No.	**Rate 100**	Particulars	**Proposed Rate T2**	Particulars
1	Total DSM Program Budget ($000's)	1,607 (1)	Total DSM Program Budget ($000's)	2,053 (1)
2	Demand Related - 75% ($000's)	1,205	Demand Related ($000's)	2,053
3	Annual Demand Billing Units (10^3m^3/day)	71,975 (2)	Annual Demand Billing Units (10^3m^3/day)	213,411 (4)
4	DSM Demand Unit Rate (cents/m^3)	**1.6749**	DSM Demand Unit Rate (cents/m^3)	**0.9622**
5	Commodity Related - 25% ($000's)	402		
6	Annual Commodity Billing Units (10^3m^3)	1,895,488 (3)		
7	DSM Commodity Unit Rate (cents/m^3)	**0.0212**		

Notes:
(1) Excludes Low-income amounts.
(2) EB-2011-0210 updated July 13, 2012 to reflect the Settlement Agreement, Exhibit H3, Tab 1, Schedule 2, Page 4, line 10, column (a).
(3) EB-2011-0210 updated July 13, 2012 to reflect the Settlement Agreement, Exhibit H3, Tab 1, Schedule 2, Page 4, line 11, column (a).
(4) EB-2011-0210 updated July 13, 2012 to reflect the Settlement Agreement, Exhibit H3, Tab 11, Schedule 1, line 18, column (a).

UNION GAS LIMITED

Answer to Interrogatory from
TransCanada Energy Ltd. ("TCE")

Reference:

a) Exhibit A, Tab 1, Page 29, Lines 8 to 12

"Until August 1st, Direct Access customers can either receive an incentive for an energy efficiency project or earmark funds for projects with completion dates after this milestone. Earmarking is defined as an intentional hold of a customer's direct access incentive funds prior to the August 1st commitment date." (Emphasis Added)

b) Exhibit A, Tab 1, Page 29, Lines 12 to 14
"A project will be earmarked for funding from a customer's Direct Access funds if Union has received documentation from the customer that is acceptable to Union." (Emphasis Added)

a) Can a customer receive an incentive amount greater than its own direct access incentive fund?

b) Can a particular customer Earmark an amount superior to its own direct access incentive fund?

c) Provide the criteria used to determine if a project is acceptable to Union.

Response:

a) A customer can receive an incentive amount greater than their own Direct Access incentive fund if, after August 1st, funds are available in the rate class aggregate pool.

b) A Direct Access customer cannot earmark an incentive amount greater than their own Direct Access incentive fund.

c) The acceptability criteria includes the completion of Union's existing custom project application form which outlines the project details. With Union's assistance, items such as the high efficiency option, the base case, incremental cost, measure life and commissioning date need to be provided along with all supporting documents, calculations and/or metered data.

To earmark funds, a letter from the customer committing a project commissioning and/or study completion date prior to December 31 of the program year would also be required.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Page 3 of 36
DSM Guidelines for Natural Gas Utilities dated June 30, 2011 (EB-2008-0346)
EB-2011-0210 Exhibit H1 Tab 1 T1/T2 Split

Preamble: Union references the OEB DSM Guidelines and notes that the OEB refers to customers in Rate 100 and T1 as Large Industrial and Union indicates that not all of the customers within these rate classes are industrial and has referred to them as 'Large Volume' customers. APPrO is interested in better understanding the nature of the customers contracting for distribution service under these rate categories.

a) Please provide a description/classification of the customer groupings that fit within these rate categories.

b) Please provide a table showing the following information for 2013

- Number of customers within each of Rate 100 and T1 rate category by the description/classification noted in a)
- The aggregate contract demand by description/classification for 2013 and 2014 and rate category
- The forecasted annual consumption for 2013 and 2014 by description/classification and rate category

c) Assume that the OEB approves the new rate T2 category as applied for in EB-2011-0210; please redo the table in b) to reflect the 3 rate categories.

Response:

a) Customer's included within the Rate 100 and Rate T1 rate categories can be classified as Industrial, Power, Commercial and Greenhouse. Please see the response at b) and c) below for customer details.

b) Union has not completed a consumption forecast for 2014. The table below provides the requested data presuming no T1-T2 split for 2013 volumes only.

Rate Class	Customer Classification	Number of Customers	Aggregate 2013 FIRM CD m^3	Aggregate 2013 Interruptible CD m^3	Aggregate MAV m^3	Total Forecast 2013 Consumption m^3
T1	Industrial	43	11,128,590	2,958,903	11,254,555	3,489,354,415
	Power	9	8,188,000	3,393,100	636,463,000	1,573,221,390
	Greenhouse	5	309,600	0	6,468,540	48,847,120
	Commercial	2	278,900	67,200	0	53,559,260
Rate 100	Industrial	11	3,005,600	2,820,000	4,944,540	1,009,208,520
	Power	7	2,233,900	455,000	0	915,517,000

c) Union has not completed a consumption forecast for 2014. The table below provides the requested data presuming T1 is split into T1 and T2 categories for 2013 volumes only.

Rate Class	Customer Classification	Number of Customers	Aggregate 2013 FIRM CD m^3	Aggregate 2013 Interruptible CD m^3	Aggregate MAV m^3	Total Forecast 2013 Consumption m^3
T1	Industrial	32	1,668,850	605,000	5,620,540	475,915,400
	Power	1	31,000	0	167,000	5,000,500
	Greenhouse	5	309,600	0	6,468,540	48,847,120
	Commercial	1	111,400	67,200	0	19,222,970
T2	Industrial	11	9,459,740	2,353,903	5,634,015	3,013,439,015
	Power	8	8,157,000	3,393,100	636,296,000	1,568,220,890
	Greenhouse	0	0	0	0	0
	Commercial	1	167,500	0	0	34,336,290
Rate 100	Industrial	11	3,005,600	2,820,000	4,944,540	1,009,208,520
	Power	7	2,233,900	455,000	0	915,517,000

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 1.1, page 5

Preamble: Union indicates that one of the comments received in the feedback session was: "Customers commented that they value Union's energy-efficiency focused engineering expertise, noting they do not want to lose access to this resource". APPrO wants to better understand this comment received.

a) Given that the T1 rate category includes small industrial customers with annual consumption from 5 $10^6 m^3$ 1) to large customers 635 $10^6 m^3$ 2). Please indicate if this comment uniformly came from all sizes of customers or if it predominately came from smaller customers.

b) Please provide the number of in-house technical resources and the specific qualifications of these resources.

Response:

a) Both large and small volume Rate T1 customers expressed the view that they valued Union's energy-efficiency focused engineering expertise, as outlined in Exhibit A, Tab 1, Appendix C.

b) The background context cited in the preamble is specifically in reference to the engineering expertise of the technical support staff. This customer technical support complement is comprised of a manager and 8 staff. Each of these individuals are trained professional engineers, (Chemical or Mechanical engineering designations) carrying P. Eng. certification with over 150 years of engineering experience on an aggregated basis. Additional certifications held include Certified Energy Managers, Certified Measurement and Verification Professional and Certified Demand-Side Management Professional.

Over their careers, these individuals have worked extensively in industrial and other diverse environments that include mining, pulp and paper, greenhouse, institutional, food and beverage, automotive, steel and iron foundry, coal and natural gas fired power generation, integrated steel mills, refineries and chemical plants. These individuals have become skilled at identifying "best-practice" energy conservation solutions and then implementing such solutions across different industries.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 1.1, page 6

Preamble: Union indicates: "It is Union's view that the Plan is consistent with the Guidelines while balancing the goals of the Board and the interests of Union, its customers and its stakeholders." APPrO would like to better understand the interests that are being balanced.

a) Please explain what balance was trying to be achieved.

b) For each of the parties noted in the above quote (Union, its customers and its stakeholders) please detail the interests of each party that has been taken into account and how the Plan as filed strikes the balance noted.

Response:

a) The Large Volume DSM Plan is designed to find a balance between the guiding objectives of the Board and the interests of Union, its customers and its stakeholders.

b) The Plan is targeted to all customers within the Rate T1, Rate T2 and Rate 100 rate classes and would recover the associated costs from all customers. This is consistent with the principles of class ratemaking which have been supported and endorsed by the Board on numerous occasions.

While the DSM Guidelines[1] outlined that ratepayer funded DSM programs for large industrial customers are no longer mandatory and will be considered on their merits, the Board provided three overarching guiding objectives[2] for the design of natural gas DSM programs and the overall portfolio. They are to maximize cost effective natural gas savings, prevent lost opportunities and pursue deep energy savings. The Plan is also consistent with these objectives as it will:

[1] Ontario Energy Board. *Demand Side Management Guidelines for Natural Gas Utilities.* (EB-2008-0346). Section 8.2, Page 26.
[2] Ontario Energy Board. *Demand Side Management Guidelines for Natural Gas Utilities.* (EB-2008-0346). Section 3, Page 4.

1. Drive capital and O&M efficiency upgrades. Historical results have shown that this market is the most cost effective, achieving the largest m^3 savings per dollar spent.
2. Provide a targeted set of offerings for Rate T1, Rate T2 and Rate 100 customers that take customers from the initial identification stage, to actual idea implementation. This ensures opportunities are not just identified, but are implemented using best practices and best available information to prevent lost opportunities.
3. Pursue deep energy savings through the comprehensive approach of the program's five offerings where Union's staff, through influence and demonstration of expertise, enable energy conservation to become an imbedded component of the customers' organizational goals.

Union has taken into account the interests of its customers and stakeholders heard through the following 2012 consultation efforts:

1. The Focus Group Meetings' As It Was Heard Reports found in Appendix C and E outline that:
    - The majority of customers value Union's technical resources, would like increased flexibility to access incentives and want to avoid large one-time deferral charges. Union balanced these interests by continuing to offer the program but enhancing it by introducing a new Direct Access budget mechanism and eliminating the ability to overspend 15% of the budget for Rate T2 and Rate 100.
    - Some customers would like to not participate in the program and avoid associated costs. This would require an opt-out mechanism which would violate the well-established principles of class ratemaking. Please see Exhibit A, Tab 1, Section 7.

2. The five additional consultation meetings with customers and stakeholders in July 2012 clarified that primarily power producers would like to opt-out of the program. Please see Exhibit A, Tab 1, Section 7. Others noted the proposed program included positive improvements.

3. Union received stakeholder feedback on the program design and scorecard details at the August 15, 2012 Consultative meeting. Union balanced these interests by making the adjustments outlined in Appendix H.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 1.2, page 7
EB-2008-0346

Preamble: Union indicates that "The Direct Access budget program is being introduced as a direct response to feedback received from Union's largest customers." APPrO would like to better understand this feedback.

a) Please confirm that the most if not all of Union's customers, that would be eligible for rate 100 and T2 rate classes, are represented by one of APPrO, IGUA or CME.

b) Please confirm that in Union's consultation sessions with customers that a number of large customers expressed a preference to not participate in Union's ratepayer funded DSM programs.

c) Please confirm that APPrO's feedback to Union on behalf of its members was to not require large volume customers participate in a ratepayer funded DSM programs.

d) Please confirm that in its submission to the Board in EB-2008-0346 dated 21 April 2011, IGUA s submission that ratepayer funded DSM programs for industrial customers should be discontinued.

e) Please confirm that CME in its written submission to the Board on 21 April 2011 in EB-2008-0346 stated:

> "*CME also has some members who operate very large industrial enterprises. These members would, for instance, be customers of Union's T1 or Rate 100 rate classes. CME is concerned about the appropriateness of affording competitive advantages to one large industrial over another through the receipt of utility funded custom projects. Many of these customers have resources and experience to undertake their own conservation activities. CME urges the Board to establish a process to fully assess whether gas DSM should continue to be offered and funded by the continuation of gas DSM for the largest industrial rate classes. Within this context, if the Board is inclined to continue to approve gas DSM for large industrial rate classes, then the Board should also consider the appropriateness of permitting large industrial customers to opt-out of funding and receiving DSM programs."*

Response:

a) Although Union does not know which customers are members of APPrO, IGUA or CME, Union believes most customers are represented by the aforementioned organizations.

b) As referenced at Exhibit A, Tab 1, Page 6 of 36, some large customers expressed support for Union's ratepayer funded DSM program and some large customers expressed a preference to not participate.

c) Confirmed.

d) Confirmed.

e) Confirmed.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 1.2, page 8

Preamble: Union indicates that: "Within an environment of competing production demands, limited resources and low commodity prices for natural gas, it is important to continually ensure energy-efficiency remains a priority for large volume customers."

a) Does Union believe that Union is in a better position than individual customers to evaluate and ration the scarce resources it has available to meet such customer's competitive needs? Explain.

Response:

No.

Union believes that individual customers are in the best position to evaluate and ration their scarce resources. Union's proposed DSM program is not intended to replace or supersede the customer's energy efficiency evaluation and decision making role but is intended to align with and complement the customer's energy efficiency needs and goals and ensure projects and studies are completed on an ongoing basis. Union has significant experience with energy efficiency applications across a broad cross-section of customer segments. On many occasions Union has utilized its firsthand knowledge of best-in-class energy efficiency practices to identify solutions that were successful in one market segment and carried them across to implementation in a different segment. The proposed DSM program is well positioned to continue to facilitate this knowledge sharing and assist customers with identifying and capturing energy savings opportunities.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 1.2, page 8

Preamble: Union indicates that:

> *"Although some customers, such as power producers, have indicated that they would like to opt-out of the Plan, significant economically feasible efficiency opportunities remain in the province that large volume customers have not undertaken to-date".*

APPrO would like to better understand this position.

a) Please provide the basis for this statement.

b) Please explain the underlying assumptions used to make this statement.

c) Please provide the total number of the new Clean Energy Supply (CES) plants that are situated in Union's Southern franchise region.

d) Is it Union's view that new state of the art CES plants require significant energy efficiency programs?

Response:

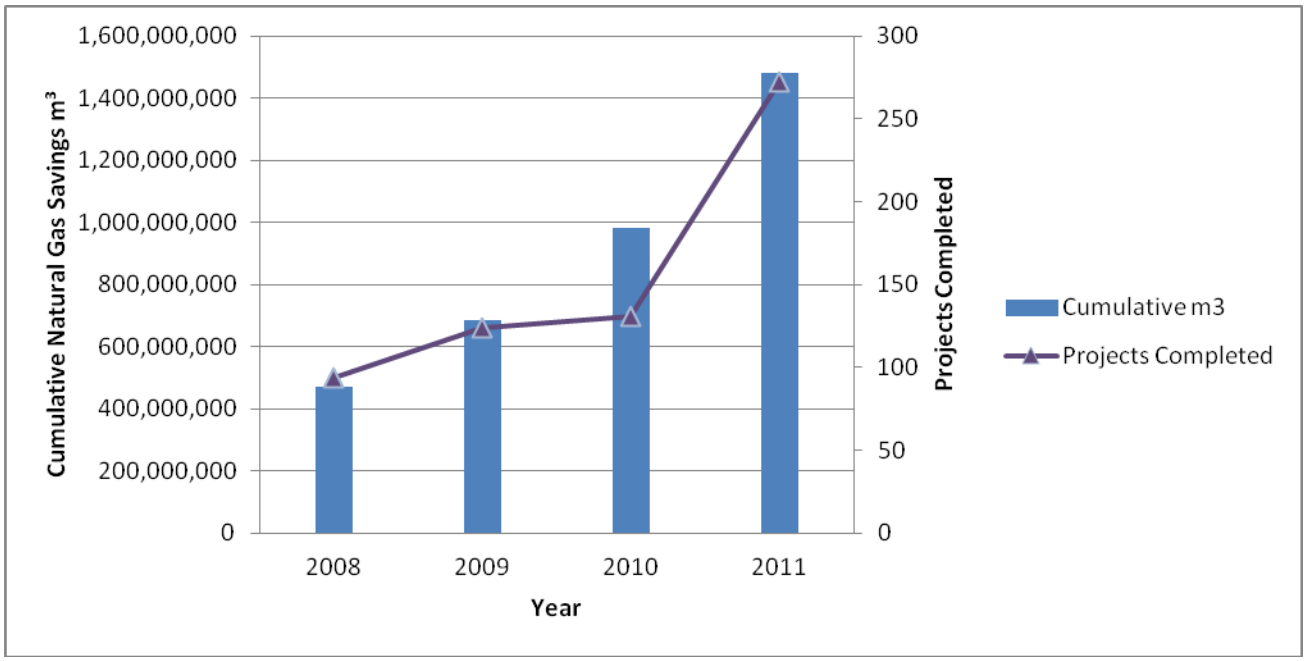
a) Union has been actively promoting and delivering energy efficiency programs to its large volume customers since 1997. During this time Union has developed valuable insight into its customers and their operations' use of natural gas to fuel their processes. Based on this experience, Union believes that economically feasible energy-efficiency opportunities are still abundant in large volume customer facilities.

   Furthermore, a review of two recent Ontario studies[1] indicated that there still exists a large economic potential for natural gas savings in the industrial sector. A study conducted by Marbek Resource Consultants Ltd, confirmed "the existence of significant cost-effective DSM potential within all sub sectors of Union's Industrial

[1] ICF Marbek. *Natural Gas Energy Efficiency Potential, Summary Report – Update 2011. July 2011 (EB-2011-0327,Exhibit A, Appendix K)* and Canadian Manufacturers & Exporters in Associate with Stantec Consulting, Marbek, and ODYNA. *Advancing Opportunities in Energy Management in Ontario and Manufacturing Sector: Final Report, March 31, 2010, Revision 2.*

sector"[2].

In addition, Union considered its success in delivering energy efficiency programs to its large volume customers. As shown in the graph below, from 2008 through 2011, Union saw an increase, year over year, in cumulative natural gas savings and projects completed. Union's large volume program will continue to ensure customers focus their attention on energy-efficiency and the achievement of these savings.



b) Please see the response at Exhibit B5.6 a).

c) The number of natural gas fired generation plants that were constructed in Union's franchise area is the following:
2004 - 2 plants
2009 - 2 plants
2010 - 1 plant

d) As is the case for any new facilities in any industry, the opportunity to undertake energy efficiency initiatives will be fewer in new CES plants. However, even in new state of the art CES plants there will be energy efficiency opportunities.

Referring to Exhibit A, Tab 1, page 9 of 36, Table 1, Union's DSM program involvement with gas-fired power generation customers has grown from 2 projects in

[2] Marbek Resources Consultants Ltd, *Natural Gas Energy Efficiency Potential, Industrial Sector, Final Report – March 24, 2009, Page 100.*

2008 to 25 projects in 2011 and this activity has driven a cumulative 230 million m^3 of natural gas savings. Through our work specifically with the power plants that have been constructed since 2004 we have identified and implemented energy savings projects that include:

- Steam system upgrades, repairs and maintenance
- Power plant feed-water improvements
- Insulation repairs and upgrades
- Controls and sequencing improvements
- Condenser optimization
- Turbine inlet cooling
- Upgraded aero derivative gas turbines
- Gas turbine overhauls
- Gas turbine power mapping
- Unit air pre-filter upgrades
- Gas turbine compressor washing
- Vacuum pump improvements
- Gas bath heater improvements
- Water treatment improvements
- Blow down heat recovery
- High-efficiency steam boilers
- Gas heating via HRSG loop
- Start-up time optimization

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 1.2, pages 9 – 12

Preamble: Union indicates that:

> *"59% of the DSM amount in rates is budgeted for customer incentives and 15% for program technical resources. This 74% of the total DSM amount allocated to Large Volume rate classes directly supports the identification, analysis and implementation of energy-efficiency projects."*

APPrO would better understand these percentages.

a) Please confirm that based on the above noted percentages, the balance of the costs of the DSM programs or 26% of the DSM budget goes to administration and overheads or other costs not directly related to implementation of energy efficiency projects.

b) Please confirm that these percentages exclude the Union incentive payments that would be paid for by customers in the event that Union met the necessary scorecard targets.

c) Union indicates that the 15% of the budget ($6.209 m3) or $931,000 is for Technical Resources and is directly involved in energy-efficiency projects. Table 2 indicates that the Technical Resources budget is $907,000 and adjusted for inflation for 2012 and 2013 (2.87% and 2.25% respectively) suggests that the Technical Resource budget is $954,000. Please confirm that 97.5% of the Technical Resources are directly involved in energy implementation projects and only 2.5% is involved in administration, program evaluation, program promotion supervision or other activities that are not directly involved implementation of energy-efficiency programs. If not confirmed, please indicate what percentage of the technical resources are related to administration, program evaluation, program promotion or other activities not directly related to implementation of energy-efficiency programs.

d) Please recalculate the percentage of the 'DSM amount' that is directly allocated to supporting energy-efficiency projects if the incentive payments are included in the calculation assuming 100% payout.

Response:

a) Confirmed. The 26% of the DSM budget goes to costs which directly support the program, such as program promotion and evaluation, as well as portfolio-level costs such as research, evaluation and audit activities to meet regulatory requirements. It also includes an allocation of the low-income DSM budget.

b) Confirmed.

c) Not confirmed. The percentage in Figure 1 for Technical Resources rounded to two decimal places is 15.36%. The 2.5% discrepancy noted in the question is due solely to this rounding.

- 15.36% of the total DSM budget ($6.207 million) = $0.953 million
- $0.907 million adjusted for 2012 and 2013 inflation (2.87% and 2.22% respectively) = $0.953 million

Within the Technical Resources budget 11.1% is related to sales and marketing support and administration. In 2013 this is $0.106 million.

d) If the 100% DSM Utility Incentive is included in the calculation 67% of the DSM amount is directly allocated to supporting energy-efficiency projects.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 2, pages 14 and 35

Preamble: Union indicates that it has the ability to overspend the DSM budget for T1 by 15%, but not Rate T2 or Rate 100. It also states that if the new T2 budget category is not approved, then it will restore the 15% overspend for all rate categories.

a) Please indicate what amount is being increased by 15% to provide a greater DSM funds under both the situation where T2 is approved and where it is not approved.

b) Why is this 15% amount required?

c) To the extent that it is required, please explain why this should not also result in a corresponding reduction in the following year's DSM budget for such rate category?

d) How will the overspending be recovered from customers? Assuming that Union does overspend by the 15% and the rate T2 category is not approved, what will be the additional cost that a large volume customer using 10 PJ of gas will incur as a result of this overspend flexibility.

Response:

a) In the event Rate T2 is approved the 2013 amount being increased by 15% is $1.697 million. This is the Rate T1 2013 program and allocated portfolio budget.

In the event Rate T2 is not approved, the 2013 amount being increased by 15% is $5.358 million. This is the total 2013 Large Volume program and allocated portfolio budget.

b) The 15% amount is required to produce results in excess of the scorecard target(s) towards achievement of the Upper Band target(s). The rationale for the 15% is outlined in the DSM Guidelines:

"The option to spend 15% above the approved annual DSM budget is meant to allow the natural gas utilities to aggressively pursue programs which prove to be very successful."[1]

c) The 15% amount is unrelated to the following year's DSM budget.

d) Any overspending of the DSM budget for Rate T1, regardless of Board approval of the proposed Rate T2 rate class, will be tracked in the Demand Side Management Variance Account (DSMVA) and recovered from all Rate T1 customers as part of Union's annual deferral disposition proceeding.

For a Rate T1 customer consuming 10 PJ of gas annually, the bill impact associated with a 15% DSM overspend (or $562,566) will be approximately $29,000. The calculation of this impact is shown in Table 1 below.

Table 1

Line No.	Particulars	Amount	
1	15% Overspend Amount ($000's)	562.566	(1)
2	2013 Rate T1 Forecast Usage (10^3m^3)	5,164,982	(2)
3	Unit Rate for 15% Overspend Amount (cents/m^3)	0.0109	(3)
4	Customer Usage (GJ)	10,000,000	
5	Customer Usage (m^3)	264,900,000	(4)
6	Bill Impact ($)	**28,874**	(5)

Notes:

(1) EB-2012-0337, Exhibit A, Tab 1, Schedule 1, line 2, column (j) x 0.15.
(2) EB-2011-0210, updated July 13, 2012 to reflect the Settlement Agreement, Exhibit H3, Tab 1, Schedule 2, Page 8, line 16, column (a).
(3) Line 1 / Line 2 x 100.
(4) Line 4 / 37.75 GJ per 10^3m^3 x 1000.
(5) Line 3 x Line 5 / 100.

[1] Ontario Energy Board. *Demand Side Management Guidelines for Natural Gas Utilities* (EB-2008-0346) p. 34

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 2, pages 14

Preamble: Union indicates that it wishes to have the sole discretion to transfer up to $0.5 m of funds to rate T1, T2 or Rate 100.

a) Why does Union require this sole discretion?

b) Should underspending in one rate class category not just be credited to the deferral accounts for such rate class and be crediting to such customers?

c) What criteria will Union use to decide whether to transfer the funds?

d) Who will pay for this overspending? What is the impact to each of the above 3 rate categories if the amount is transferred to that rate class?

e) How will the additional funds be collected from customers in the rate class receiving the funds?

f) How will the funds be returned to those customers in the rate class where the funds are being sourced?

Response:

a) This discretion is required to allow Union to respond to available DSM market opportunities, maximizing program results and energy savings for customers. The sole discretion to transfer $0.500 million between Large Volume Rate Classes is consistent with the EB-2011-0327 Settlement Agreement and with the DSM Guidelines which outlined the level of guidance in the DSM framework "is meant to ensure that adequate flexibility in DSM program and portfolio design is maintained, while recognizing that the natural gas utilities are ultimately responsible and accountable for their actions. This flexibility should ensure that the natural gas utilities can continuously react to and adapt to current and anticipated market developments."[1]

[1] Ontario Energy Board. Demand Side Management Guidelines for Natural Gas Utilities. (EB-2008-0346). June 30, 2011. P.4.

b) Any underspending in one rate class relative to the DSM costs included in rates will be tracked in the Demand Side Management Variance Account (DSMVA) and recovered/refunded from all customers in the rate class as part of Union's annual deferral disposition proceeding.

c) The criteria Union will use to decide whether or not a fund transfer is warranted includes the following:

a) Program budget management throughout the fiscal year;
b) Review and consolidation of Direct Access customers energy-efficiency plans, to map out a potential customer incentive spend forecast;
c) Feedback from customer interaction through account and technical project managers; and
d) Review of earmarking activity, to ensure the Direct Access customer incentive budget will be spent on energy-efficiency projects.

d) Any variance between the DSM costs included in rates and actual DSM spending by rate class will be tracked in the Demand Side Management Variance Account (DSMVA) and recovered/refunded from all customers in the rate class as part of Union's annual deferral disposition proceeding.

Please see Table 1 below for the unit rate impact of transferring and spending $0.500 million to the Rate 100, Rate T1 or Rate T2 rate classes.

Table 1

Particulars	Rate 100	Rate T1	Rate T2
Transfer Amount ($000's)	500	500	500
2013 Forecast Usage (10^3m^3)	1,895,488	548,986	4,615,996
Unit Rate (cents/m^3)	0.0264	0.0911	0.0108

e) Please see the response to part d) above.

f) Please see the response to part d) above.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 3, page 16

Preamble: The scorecard metric for cumulative natural gas savings is based on the total natural gas saved for all projects over their useful life net of adjustment factors such as free ridership and spillover.

a) Please specify how the measured life of a project is determined for each type of DSM program element.

b) It is understood that a free rider is a program participant who would have installed a measure on his or her own even without the program and spillover effects relate to customers that adopt energy efficiency measures because they are influenced by a utilities program-related information and marketing efforts. Please indicate specifically how the effects of free ridership and spillover are identified and measured.

c) In the event that customers have regular in-house energy management programs independent of the utility DSM program, how is this taken into account in determining the measured life of a project? For example if the life of a maintenance project is 10 years and if the company on its own initiative would have implemented the program in 4 years but it is accelerated because of the program incentives, how are the cumulative m3 savings measured in such case?

d) It is understood that if the T2 rate category is not approved, then Union maintains the ability to overspend the entire T1 budget by 15%. What changes to the scorecard metrics does Union propose to deal with this event?

e) Please provide a copy of the latest DSM audit.

Response:

a) The measure life of a project is the number of years the project is expected to have m^3 savings. Measure life is determined by one of two means:

1) Through a custom assessment, in conjunction with customers, best-practices and related experience in similar energy-efficiency projects; or

2) Through Union's measure life guideline document for common project types.

Measure life is reviewed through the annual program Verification and Audit activity. Qualified and independent third-parties undertake a review of projects from a representative sample, reviewing the associated savings claim for completeness and reasonability. Measure life is reviewed at the same time.

b) While numerous approaches can be taken, measuring free ridership and spill-over is typically achieved through the administration of surveys directed towards a sample of program participants, non-participants, and upstream actors to identify where influence has occurred and quantify the related energy savings that can be attributed to that influence as a percentage of the program energy savings. In the event a free rider and spill-over study is conducted for Union, the Technical Evaluation Committee would determine the approach that would be used.

c) The associated savings on a project are adjusted by the application of free ridership, and not on adjustments to the measure life.

d) Please see Exhibit A, Tab 1, Page 36, lines 11 to 27.

e) Please see Attachment 1 for the *Audit Report on Union Gas Draft DSM 2011 Annual Report* which was filed with the Ontario Energy Board on June 29, 2012.

Filed: 2012-10-25
EB-2012-0337
Exhibit B5.10
Attachment 1

Audit Report on Union Gas Draft DSM 2011 Annual Report

Final Report

June 15, 2012

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This report was prepared by Alec Josephson, Steven Carter, Tom Souhlas, and Tessa Krebs of ECONorthwest, which is solely responsible for its content. ECONorthwest specializes in analyzing issues related to economics, finance, and planning. We have nearly 40 years of experience providing public and private clients with our unique services. With nearly 50 economists, planners, policy analysts, and programmers, we are the largest economics consulting firm in the Pacific Northwest.

Staff at Cascade Energy, Inc. supported the audit by providing technical expertise in reviewing the engineering reports accompanying Union Gas' Draft DSM 2011 Annual Report. We appreciate the guidance and support of staff at Union Gas and the DSM Evaluation and Audit Committee.

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TABLE OF CONTENTS

ABBREVIATIONS

Draft DSM 2011 Annual Report – Union Gas Draft DSM 2011 Annual Report

DSM – Demand Side Management

DSMVA – Demand Side Management Variance Account

EAC – Evaluation and Audit Committee

ECONW – ECONorthwest

Enbridge – Enbridge Gas Distribution

ESK – Energy Saving Kits

EUL – Effective Useful Life

HWC – Hot Water Conservation

IR - Infrared

LRAM – Lost Revenue Adjustment Mechanism

OEB – Ontario Energy Board

SSM – Shared Savings Mechanism

TEC – Technical Evaluation Committee

TRC – Total Resource Cost

Union – Union Gas Limited

EXECUTIVE SUMMARY

As per Union's request for audit, in regulation with OEB guidelines, ECONW was engaged in conducting an independent, third-party audit of Union's Draft DSM 2011 Annual Report.[1] To conduct the audit, the Audit Team (comprised of staff at ECONW and Cascade Energy, Inc.) reviewed Union's 2011 savings estimates and the calculations, assumptions, background materials, and other documentation supporting the results presented in the Draft DSM 2011 Annual Report.

This audit identifies instances in which the calculations and results presented in the Draft DSM 2011 Annual Report could be improved. All of the Audit Team's recommendations are discussed, in detail, in this report. To summarize, the Audit Team recommends the following changes to the Draft DSM 2011 Annual Report:

- Change the adjustment factors for the Commercial Multi-Family HWC Program to match those identified in the SeeLine verification study.
- Change the adjustment factors for the Commercial Non Multi-Family HWC Program to match those identified in the Energuy verification study.
- Regarding the current use of natural gas hot water heaters, change all "Don't Know" responses collected through surveys supporting the Beslin verification study to "No" responses, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.
- Assume that all "Don't Know" responses collected in the Beslin verification study related to the use of low-flow showerheads indicate no use of low-flow showerheads, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.
- Correct the equations used to calculate the adjustment factors for the ESK Residential Push/Pull/Install Replacement measures.
- Change the adjustment factors for the ESK Residential Push Showerhead Replacement measures to accurately reflect those reported in Beslin's verification study.
- For the 2012 program year, begin tracking the number of two-stage IR (infrared) heater units installed, and use the gas savings assumptions for each type of heater rather than the blended gas savings across heater types.
- Investigate methods to disaggregate the blended incremental cost factor for IR heaters.
- Work with the Technical Evaluation Committee (TEC) to finalize free-ridership rates for new measures initiated in 2011, and develop a process for estimating free-ridership rates for new measures in the future.
- Decrease the EUL assumption for Condensing Boilers under 300 MBTU/h from 25 years to 22 years until the EUL of 25 years for this class of boilers is justified.
- Change the annual electricity savings rate for Condensing Make-up Air Units to accurately reflect industry practice.
- Use the audited realization rates to reflect the changes in savings for six of the Commercial Custom projects.

[1] Union Gas. 2012. *Draft Demand Side Management 2011 Annual Report.* April 2.

- For the 2012 program year, calculate realization rates using stratification weights from the sample drawn for verification. This approach is in line with industry best practices, and will improve the statistical accuracy of the realization rates.
- Given limited resources for DSM evaluation and verification, the Audit Team recommends improving coordination among Union staff and consultants to reduce duplicative and potentially unnecessary efforts regarding the estimation of realization rates.
- To improve the information available for Commercial Custom projects, the Audit Team makes the following recommendations:
  - Collect pre-project documentation of whether the project involves an expansion of production capacity.
  - Collect pre-project utility history for the facility or meter where the project will be affected.
  - Record baseline conditions (operating hours, operating usage, baseline equipment configuration, etc.).
  - Collect post-project documentation of what equipment and operating changes were made.
  - Record upgraded condition (operating hours, operating parameters, upgraded equipment configuration, etc.).

Table ES-1 summarizes how adjustments and recommendations identified in this audit impact the results presented in Union's Draft DSM 2011 Annual Report. In some instances, the recommendations listed above do not represent specific action items for the Draft DSM 2011 Annual Report, but rather represent recommendations for future actions relevant to next year's evaluation. Those recommendations are not reflected in Table ES-1.

Table ES-1. Summary of Adjustments

Measure	Description of Change	TRC Impact	SSM Impact (no cap)	LRAM Impact	Natural Gas Savings (m^3)
Prescriptive Measures					
HWC Commercial Multi-Family	Adj. Factor	+$130,816	+$5,178	+$497	+20,533
HWC Commercial Non Multi-Family	Adj. Factor	+$13,018	+$515	+$47	+2,034
ESK Residential Push/Pull/Install	Adj. Factor	–$271,746	–$10,756	–$1,720	–65,447
Quasi-Prescriptive Measures					
Condensing Make-up Air Units	Electricity Savings	+$10,482	+$415	N/A	N/A
Custom Projects					
All Custom Adjustments	N/A	-$84,114	-$3,329	-$450	-20,201
Total (All Adjustments)	N/A	-$201,544	-$7,977	-$1,626	-63,079

I. INTRODUCTION

ECONW and Cascade Energy (Audit Team) were retained to perform an independent audit of the Draft DSM 2011 Annual Report.[2] To conduct the audit, the Audit Team reviewed Union's 2011 savings estimates and the calculations, assumptions, background materials, and other documentation (including relevant files for Custom projects) supporting the results presented in the Draft DSM 2011 Annual Report.

A. Audit Approach

The Audit Team's approach to the audit followed four general principles:

- **Review savings calculations for accuracy.** The preliminary review ensures that all *simple* errors applied in the basic savings calculations (e.g., incorrect cell references and/or application of free ridership adjustments) have been identified and recommendations for changes have been stated.
- **Review calculations for consistency with stated objectives.** The next level of review ensures that all factors that have been determined through earlier agreements with the OEB have been applied correctly.
- **Review savings claims and related savings components for appropriate documentation.** This level of review ensures that all supporting materials used for the Draft DSM 2011 Annual Report have been properly documented and applied.
- **Review overall processes used to determine annual savings.** This level of review ensures that the over-arching decisions made by Union Gas in producing the Draft DSM 2011 Annual Report were consistent with its objectives and with past efforts.

This audit focused on the 2011 program areas as defined in the Draft DSM 2011 Annual Report (see Table 1).

Table 1. Sector Programs in the Draft DSM 2011 Annual Report

Sector	Program
Residential	• New Home Construction • Home Retrofit • Market Transformation
Low Income	• Helping Homes Conserve (HHC) • Weatherization
Commercial	• New Building Construction • Building Retrofit
Distribution Contract	• Custom Projects

Source: Union Gas. 2012. *Draft DSM 2011 Annual Report.* April. Pg. 7.

[2] Union Gas. 2012. *Draft Demand Side Management 2011 Annual Report.* April 2.

Table 2 contains all of the tasks the Audit Team completed while conducting the audit of the Draft DSM 2011 Annual Report.

Table 2. Checklist of Audit Process and Objectives

Audit the Draft 2011 DSM Annual Report to identify if there are claims made by Union that have not been substantiated.	✔
Review Union's procedures for tracking program participants and determine whether they lead to accurate counts.	✔
Verify that Union's claimed input assumptions for SSM are accurate and consistent with the OEB filed and approved SSM input assumptions.	✔
Verify that Union's claimed savings for LRAM are accurate and based on best available information at the time of the audit.	✔
Verify that the calculation methodology used to determine the SSM incentive and the LRAM amount adheres to the OEB approved method.	✔
Review third party verification of Commercial and Distribution Contract Custom projects for reasonableness. This review will not duplicate the detailed third party analysis of savings estimates and evaluation findings. Instead, the audit review will provide an opinion on the methods and parameters used in consideration of the OEB framework under which the programs operate.	✔
Review and verify the appropriateness of the Market Transformation program claim and related shareholder incentive.	✔
Review and provide an opinion on the DSMVA account.	✔
Review evaluation studies conducted in support of the DSM portfolio and provide recommendations on priority evaluations for 2012.	✔

B. Summary of Findings

After reviewing the data contained in the Audit Tool, the verification reports, and other documentation, it is the opinion of the Audit Team that the data and information provided by Union conforms to the Audit Team's understanding of the guidelines established in the Decisions and Reasons Document (EB-2006-0021). Table 3 summarizes the overall impacts on net TRC, SSM (no cap), SSM (with cap), LRAM, and natural gas savings from all of the recommendations identified and discussed in this report.

Table 3. Audit Adjustments to Net TRC, SSM, LRAM, and Natural Gas Savings

Account	Draft DSM 2011 Annual Report	2011 Audit Value	% Change
Net TRC	$379,580,963	$379,379,419	-0.05%
SSM (no cap)	$9,773,825	$9,765,848	-0.08%
SSM (with cap)	$9,243,367	$9,243,367	No Change
LRAM	$822,251	$820,625	-0.20%
Natural Gas Savings (m^3)	163,766,311	163,703,231	-0.04%

II. REVIEW OF SSM AND LRAM CALCULATIONS

The Audit Team reviewed the results of SSM and LRAM calculations as presented in the Draft DSM 2011 Annual Report. Union developed a Microsoft Excel-based tool (Audit Tool) to compile and organize relevant data from a database, and then to calculate TRC, net TRC, SSM, and LRAM. The Audit Team reviewed the Audit Tool in four ways:

- Reviewed the results presented in the Audit Tool to ensure that they match the values reported in the Draft DSM 2011 Annual Report.
- Reviewed the data and calculations in the Audit Tool to ensure there are no mechanical errors in how different values are computed.
- Reviewed the data and calculations in the Audit Tool to ensure they are consistent with OEB-approved methods.
- Reviewed the input data referenced in the Audit Tool to ensure that they are consistent with values presented in the Draft DSM 2011 Annual Report and evaluated other data-related concerns raised by the EAC.

LRAM values are calculated by multiplying total natural gas savings (m^3), at the rate class-level, by the relevant rate ($/$m^3$). The LRAM values are then halved to account for variability in installation timing (i.e., not all units were installed on January 1, 2011).

SSM values rely on a more complex set of variables and calculations. Table 4 summarizes the variables and functions used in the Audit Tool to calculate SSM. After reviewing the Audit Tool, we conclude that:

- All results from the Audit Tool match the values reported in the Draft DSM 2011 Annual Report.
- There are no mechanical errors in the Audit Tool.
- The Audit Tool's calculations are consistent with OEB-approved methods.
- Issues related to specific inputs used to calculate SSM and LRAM are discussed later in this report.

Table 4. Review of SSM Calculations

Prescriptive Results	Function of . . .
Gas, Electricity, and Water Benefits ($/Unit)	free-ridership; adjustment factor; energy load; equipment life; gas, electricity, and water savings; NPV of avoided costs
Participant Costs ($/Unit)	free-ridership and incremental cost
Total Adjusted Gross TRC ($)	gas, electricity, and water benefits, participant costs, and units
Net TRC ($)	gross TRC and total program costs
SSM	net TRC and OEB-approved calculation
Custom Results	**Function of . . .**
Gas, Electricity, and Water Benefits ($/Unit)	free-ridership; adjustment factor; energy load; equipment life; gas, electricity, and water savings; NPV of avoided costs; realization rate
Participant Costs ($/Unit)	free-ridership, incremental cost, and realization rate
Total Adjusted Gross TRC ($)	gas, electricity, and water benefits, participant costs, and units
Net TRC ($)	gross TRC and total program costs
SSM	net TRC and OEB-approved calculation

III. REVIEW OF DSMVA CALCULATION

The DSMVA is calculated by subtracting DSM spending from the allocated DSM budget. Union may recover excess spending, up to 15 percent of the OEB-approved budget. Table 5 summarizes Union's DSM-related budget and spending for 2011. As shown in the final row, the DSMVA for 2011 is $616,646.

Table 5. 2011 DSMVA Calculation

	2011 Budget	2011 Spending
Program Allocation		
Residential	$3,139,000	$2,699,321
Low-Income	$1,903,000	$1,729,178
Incremental Low-Income	$2,465,000	$2,055,783
Commercial	$5,666,000	$4,143,118
Distribution Contract	$4,990,000	$8,736,579
Market Transformation	$1,464,000	$1,571,520
Program Sub-total	$19,627,000	$20,935,498
Other Allocations	$7,727,000	$7,035,147
2011 Totals	$27,354,000	$27,970,646
2011 DSMVA		**$616,646**

Sources: Union Gas. 2012. *Draft DSM 2011 Annual Report*. April. Pg. 8; Union Gas. 2010. *2011 Demand Side Management Plan*. May. Pg. 5.

IV. MEASURE-SPECIFIC AUDIT

This section describes the results of the measure-specific audit. In general, this component of the audit consisted of four tasks:

- Reviewed all verification studies completed in 2011.
- Compared results from verification studies with assumptions applied in the Draft DSM 2011 Annual Report.
- Reviewed all available documents describing input assumptions for Custom projects.
- Addressed specific issues raised by the EAC and Union.

The rest of this section is organized by measure type. First, it presents all recommendations and findings relating to prescriptive measures, followed by quasi-prescriptive measures, and finally custom projects. Each recommendation is described in isolation, with brief text describing the basis for the recommendation, and a table showing how that recommendation impacts TRC, SSM, LRAM, and natural gas savings. In some instances, the audit uncovered multiple recommendations for the same set of measures. In these instances, the impacts of each recommendation on TRC, SSM, LRAM, and natural gas savings are not additive.

A. Prescriptive Measures

For prescriptive measures, the Audit Team reviewed the savings calculations and results, including major assumptions and evaluation research used to estimate savings. The adjustment factors are applied to modify savings estimates to reflect actual penetration, which is then used to calculate actual savings. The following changes pertain to the prescriptive measures' adjustment factors as taken from independent market research then applied to savings claim. The Audit Team also reviewed specific issues raised by the EAC in their review of the Draft DSM 2011 Annual Report.

1. Hot Water Conservation – Multi-Family (Data-Transfer Error)

The audit uncovered errors in transferring adjustment factors from the SeeLine verification study of the 2011 Commercial Multi-Family HWC Program[3] to the Audit Tool and the Draft DSM 2011 Annual Report. Table 6 summarizes the adjustment factors reported in Table 9.5 of the Draft DSM 2011 Annual Report, the Audit Team's recommended changes based on the adjustment factors reported in the SeeLine verification study, and the impact on TRC, SSM, LRAM, and natural gas savings. The Audit Team recommends changing the adjustment factors to align with the results of the SeeLine verification study.

[3] SeeLine Group Ltd. 2012. *Verification Results: 2011 Commercial Multi-Family Hot Water conservation (HWC) Program Final Report*. March.

Table 6. Hot Water Conservation – Multi-Family

Program/Measure		Draft DSM 2011 Annual Report Adjustment Factor	Audited Adjustment Factor
Bathroom Aerator – 1.0gmp		60.61%	38.67%
Bathroom Aerator – 1.0gpm - Rebate		60.61%	38.67%
Kitchen Aerator – 1.5gmp		38.67%	60.61%
Kitchen Aerator – 1.5gpm - Rebate		38.67%	60.61%
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings Impact (m^3)**
+ $130,816	+ $5,178	+ $497	+ 20,534

2. Hot Water Conservation – Non Multi-Family (Data-Transfer Error)

The audit uncovered an error in transferring data used to calculate adjustment factors from Energuy's verification study of the 2011 Commercial Non Multi-Family HWC Program[4] to the Audit Tool and the Draft DSM 2011 Annual Report. Table 7 summarizes the adjustment factors used in the 2011 Draft Annual Report, the Audit Team's recommended changes to those adjustment factors, and the impact on TRC, SSM, LRAM, and natural gas savings. Table 9.7 in the Draft DSM 2011 Annual Report presents verification results for the Kitchen Aerator measure in Long Term Care and Retirement Facilities. Union has dropped this program from its portfolio, and will not claim any related savings. Therefore, excluding the verification results of the Kitchen Aerator measure in Long Term Care and Retirement Facilities increases the adjustment factor for the HWC Non Multi-Family Kitchen Aerator measure from 68.37 percent to 73.81 percent.

Table 7. Hot Water Conservation – Non Multi-Family (Kitchen Aerator)

Program/Measure		Draft DSM 2011 Annual Report Adjustment Factor	Audited Adjustment Factor
University College Dorms – 1.5gpm		68.37%	73.81%
University College Dorms – 1.5gpm Rebate		68.37%	73.81%
Other Commercial Institutional – 1.5gpm		68.37%	73.81%
Other Commercial Institutional – 1.5gpm – Rebate		68.37%	73.81%
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings Impact (m^3)**
+ $13,018	+ $515	+ $47	+ 2,034

[4] Energuy Canada Ltd. 2012. *Verification Report for Hot Water Conservation Commercial Non Multi-Family.* February.

3. ESK Residential Push/Pull/Install

The Audit Team identified four recommendations related to various Energy Savings Kit (ESK) Residential Push/Pull/Install measures. ESKs are pre-packaged measures designed to help residential customers reduce energy use and water consumption. In all cases, these recommendations change the adjustment factors applied to the relevant measures. In some cases, multiple recommendations apply to the same adjustment factors. This section describes each of the Audit Team's four recommendations applicable to these measures. In describing each of the four recommendations, the net impact of each recommendation (considered in isolation of other recommendations) is described in terms of TRC, SSM (no cap), LRAM, and natural gas savings. The net impact of all four recommendations, considered simultaneously is discussed at the end of the section.

ESK Residential Push/Pull (Survey Responses Regarding Homes with Natural Gas Hot Water Heaters)

As part of its verification of Union's ESK Residential Push/Pull measures in 2011,[5] Beslin administered surveys to develop the adjustment factors used in the Audit Tool and the Draft DSM 2011 Annual Report. In its surveys, Beslin asked respondents whether or not they had natural gas hot water heaters. While most respondents knew if they did or did not have a natural gas hot water heater, some did not know. In applying the survey results, Union adopted the industry's standard approach and dropped these "Don't Know" responses from the sample and used the remaining results to estimate the percentage of the population with natural gas hot water heaters. By dropping the "Don't Know" responses, Union implicitly distributed those responses to "Yes" and "No" responses in proportion to the known respondents.

It is not possible to precisely determine, however, how many of these "Don't Know" respondents have or do not have natural gas hot water heaters. While dropping these responses from the sample may be the standard approach when conducting market research, it has the potential to inflate the savings associated with the program without evidence of actual savings. In instances like these, the Audit Team recommends making consistent assumptions that do not inflate savings without verified evidence of actual savings. Removing these "Don't Know" respondents suggests that 92.68 percent and 85.63 percent of Pull and Push respondents (respectively) have natural gas hot water heaters. Assigning these "Don't Know" responses to the "No" category decreases these percentages to 89.41 percent (Pull) and 82.53 percent (Push).

Considered in isolation of the Audit Team's other recommendations to these measures, this recommendation reduces the adjustment factors applied to the relevant measures. Again, in isolation of other recommendations to these measures, this recommendation decreases TRC by $546,966, SSM (no cap) by $21,649, LRAM by $2,806, and natural gas savings by 107 (10^3 m^3) as reported in the Draft DSM 2011 Annual Report.

[5] Beslin Communication Group, Inc. 2011. *Final Report Following An Audit in 2012 of the Union Gas ESK-Residential Pull Initiative*; Beslin Communication Group, Inc. 2011. *Final Report Following An Audit in 2012 of the Union Gas ESK-Residential Pull Initiative*.

ESK Residential Push/Pull (Survey Responses Regarding Use of Low-Flow Showerheads)

As part of its verification of Union's ESK Residential Push/Pull Showerhead measures in 2011, Beslin administered surveys to develop the adjustment factors used in the Audit Tool and the Draft DSM 2011 Annual Report. In its surveys, Beslin asked respondents how often they use their low-flow showerheads. While most respondents identified how often they used their showerheads, some were unsure. In applying the survey results, Union put these "Don't Know" responses in the lowest shower-use category (25 percent of the time).

It is not possible to precisely determine, however, how often these "Don't Know" respondents use their showerhead. In instances like these, the Audit Team recommends making consistent assumptions that do not inflate savings without verified evidence of actual savings. Union weighted the responses by the percentage of showerhead use. Placing "Don't Know" respondents into the lowest positive use-class suggests use rates of 86.96 percent (Push), 82.53 percent (Push Replacement), and 80.42 percent (Pull). Assigning these "Don't Know" responses to the "Never Use" category decreases these percentages to 86.68 percent (Push), 81.85 percent (Push Replacement), and 80.19 percent (Pull).

Considered in isolation of the Audit Team's other recommendations to these measures, this recommendation reduces the adjustment factors applied to the relevant measures. Again, in isolation of other recommendations to these measures, this recommendation decreases TRC by $27,718, SSM (no cap) by $1,097, LRAM by $119, and natural gas savings by 5 ($10^3 m^3$) as reported in the Draft DSM 2011 Annual Report.

ESK Residential Push/Pull/Install (Calculation Error)

During the audit, Union uncovered an internal error in the equations it uses to calculate the number of verified installations. The equations reference an incorrect population, resulting in very low adjustment factors (which are used in the Audit Tool and the Draft DSM 2011 Annual Report). The Audit Team recommends correcting this error. Considered in isolation of the Audit Team's other recommendations to these measures, this recommendation increases the adjustment factors applied to the relevant measures. Again, in isolation of other recommendations to these measures, this recommendation increases TRC by $293,340, SSM (no cap) by $11,610, LRAM by $1,165, and natural gas savings by 44 ($10^3 m^3$) as reported in the Draft DSM 2011 Annual Report.

ESK Residential Push (Calculation Error, ESK Push – Showerhead – 1.25pgm - Replacement)

The Audit Team uncovered an error in transferring data used to calculate adjustment factors from Beslin's verification study of the 2011 ESK Residential Push Initiative to the Audit Tool and the Draft DSM 2011 Annual Report. Beslin's verification study found that 97.33 percent of the ESK Push Showerhead – 1.25gpm – Replacements were still installed, yielding an adjustment factor of 34.84 percent. The Draft DSM 2011 Annual Report, on the other hand, shows that only 93.06 percent were still installed, yielding an adjustment factor of 33.31 percent. In isolation of other recommendations, this recommendation increases TRC by $4,452, SSM (no cap) by $176, LRAM by $19, and natural gas savings by 1 ($10^3 m^3$), as reported in the Draft DSM 2011 Annual Report.

Summary of ESK Residential Push/Pull/Install Impacts

Table 8 summarizes the adjustment factors used in the Draft DSM 2011 Annual Report, the Audit Team's recommended changes, and the impact on TRC, SSM, LRAM, and natural gas savings. The results in Table 8 represent all four of the relevant recommendations considered simultaneously.

Table 8. Adjustment Factors for the Residential ESK Program

Program/Measure	Draft DSM 2011 Annual Report	Audited Adjustment Factor
ESK - Install - Showerhead - 1.25gpm - Replacement	26.62%	56.56%
ESK - Pull - Faucet Aerator - Bath - 1.5pgm	44.71%	43.13%
ESK - Pull - Faucet Aerator - Kitchen - 1.5gpm	57.79%	55.75%
ESK - Pull - Pipe Insulation - 2m	62.15%	59.96%
ESK - Pull - Showerhead - 1.25gpm	46.48%	44.71%
ESK - Pull - Showerhead - 1.25gpm - Replacement	26.62%	56.56%
ESK - Push - Faucet Aerator - Bath - 1.5gpm	29.92%	28.84%
ESK - Push - Faucet Aerator - Kitchen - 1.5gpm	44.36%	42.76%
ESK - Push - Pipe Insulation - 2m	52.10%	50.21%
ESK - Push - Showerhead - 1.25gpm	41.27%	39.65%
ESK - Push - Showerhead - 1.25gpm - Replacement	33.31%	70.29%

TRC Impact	SSM Impact (no cap)	LRAM Impact	Natural Gas Savings Impact (m^3)
– $271,746	– $10,756	– $1,720	– 65,447

B. Quasi-Prescriptive Measures

For the Quasi-Prescriptive measures, the Audit Team reviewed the savings calculations and results, including major assumptions and evaluation research used to estimate savings. The Audit Team also reviewed specific issues raised by the EAC in their review of the Draft DSM 2011 Annual Report.

1. Infrared Heaters

During conversations with Union and the EAC, the Audit Team was directed to consider three issues concerning measures associated with infrared (IR) heaters: (1) base-case technology of IR heater savings assessment, (2) sizing of IR heater units, and (3) market share of program participation. This section will address the base-case technology first, and then the sizing and market share issues jointly.

Base Case Technology of Heater Savings Assessment

After reviewing Agviro's assessment of IR heater savings,[6] the Audit Team concludes that the newest (and most appropriate) base-case technology, according to Natural Resources Canada,[7] is used to estimate the savings reported in the Draft DSM 2011

[6] Agviro. 2004. *Assessment of Average Infrared Heater Savings.*

[7] Natural Resources Canada. 2008. *Gas-fired Unit Heaters Energy Efficiency Regulations*. Retrieved from http://oee.nrcan.gc.ca/regulations/products/8110.

Annual Report. Union's measure sheets also appropriately use the < 80% thermal efficiency standard to calculate savings.

Sizing of Heaters and Market Share

The natural gas savings factor Union uses in determining energy savings from IR heater units is based on an average measurement of savings, weighted by the market share of three types of IR heater units (single-stage, two-stage, and high intensity). This factor also implicitly accounts for the size (thermal output in BTU/h) of the unit installed. The Audit Team was specifically asked to investigate:

- If market share percentages should be monitored so as to update the weighting components used to compute the average gas savings; and
- Whether or not unit oversizing matters in calculating the savings.

After conducting research to address these two matters, the Audit Team concludes that the *type* of IR heater unit installed has a significantly larger impact on gas savings than optimal *sizing*. Furthermore, two-stage IR heater units behave more similarly to an optimally-sized unit than do single-stage or high intensity heater units. Therefore, if more two-stage heater units are installed as replacement units, the issue of optimally-sized IR heater units becomes moot.

Currently, Union uses weighted averages based on the market share of each of the three types of IR heater units. The Audit Team contacted Nexant, author of the 2010 market share study, to gather a sense of any shifts in market share trends in IR heater units. Nexant collected data that described consumption of IR heater units by type of heater unit (single-stage, two-stage, and high intensity) and by consumer category (manufacturer, distributor, and contractor). Nexant found that, for two-stage heater units, there was more variation between the consumer categories as compared to the single-stage and high intensity heater units. In Nexant's opinion, the volatility and quality of existing survey data suggest that a similar study, conducted today, would reveal approximately the same results. At this time, the Audit Team has not found justification for adjusting the market share percentages of the three types of IR heater units as applied in the Draft DSM 2011 Annual Report.

Rather than periodically updating these market share percentages, the Audit Team recommends that Union track, as separate line items in the Audit Tool, the number of two-stage heaters installed each year. By tracking this information, Union would no longer rely on static market shares in its savings calculations. Instead, Union could use the appropriate savings factor for two-stage heaters (0.0242 m^3/BTU/h) and the appropriate factor for single-stage and high intensity units (0.0144 m^3/BTU/h).[8] This approach ensures that future changes in preferences or programming are reflected in the savings associated with the three different types of IR heater units.

The Audit Team recognizes that tracking IR heater units by heater type for calculating savings also requires that incremental costs be disaggregated as well. While the measure sheet provides clear methods as to how the aggregated savings number was calculated, there is no supporting tabulation or description that shows how the aggregated

[8] Savings factors come from the Navigant Measure Sheet.

incremental cost figure was calculated. The Audit Team recommends that Union investigate: 1) If it is possible to disaggregate the incremental cost factor, 2) The best methods as to how this disaggregation can take place.

2. New Quasi Prescriptive Programs

In 2011, Union implemented one new measure: Condensing Make-up Air Units (MUAs), and adopted Enbridge's substantiation values for one measure: Boilers under 300 MBTU/h. In previous filings, Union had grouped the savings inputs for the less than 300 MBTU/h boilers into a general class of boilers, which was approved by the EAC. The Audit Team identified three potential areas for recommendations regarding these two measures:

- Free-ridership rates applied to the two measures.
- EUL applied to Boilers under 300 MBTU/h.
- Electricity savings per unit applied to Condensing Make-up Air Units.

Free-Ridership Rates

To date, Union has not filed these two measures for negotiation with the OEB. When implementing new measures prior to OEB approval, Union applies free-ridership rates which have been negotiated with the OEB. In this instance, Union applied a free-ridership rate of five percent to the two new measures based on rates used by Enbridge. Per the EAC's request, the Audit Team looked for further justification for the free-ridership rate from other sources:

- Union's free-ridership rate is based on a negotiated agreement between Enbridge Gas Distribution and its interveners for the measure.
- While NYSERDA does not use a default free-ridership rate for new measures, it does use a default net-to-gross ratio of 90 percent for all new measures. The net-to-gross ratio is a function of the free-ridership rate and the spill-over ratio.
- Energy Trust of Oregon uses a free-ridership rate of zero percent for all new residential measures. For commercial and industrial applications, it uses a free-ridership rate equal to the three-year average (weighted by savings) of free-ridership rates at the program level. In 2011, Energy Trust of Oregon used free-ridership rates of 24 percent for new buildings, 36 percent for existing buildings, and 24 percent for production efficiency.
- California Public Utilities Commission's Database for Energy Efficient Resources (DEER) provides two examples of default net-to-gross ratios for new measures that lack sufficient data to estimate a free-ridership rate ranging from 60 to 70 percent.[9]

Without additional data (such as a measure-specific free-ridership study) the Audit Team cannot verify the free-ridership rates used for these two new measures. Furthermore, since free-ridership rates are so closely tied to the individual characteristics of each measure and the manner in which they are implemented, the Audit Team cannot propose a potentially more accurate rate. Given the relatively small savings associated with these two measures, as stated in the Draft DSM 2011 Annual

[9] California Public Utilities Commission. 2008. *Database for Energy Efficient Resources*. Retrieved from http://www.deeresources.com/.

Report, changing the free-ridership rate would not change TRC enough to push the reported SSM beyond the cap. Since data are insufficient to recommend different free-ridership rates, and since applying different rates would have no impact on SSM, the Audit Team recommends accepting the five percent rate as reported in the Draft DSM 2011 Annual Report. Moving forward, however, the Audit Team recommends raising the issue of free-ridership rates for these two measures (as well as all new measures in the future) with the TEC.

Effective Useful Life (Boilers under 300 MBTU/h)

In its 2011 filing to the OEB, Enbridge prescribed an EUL of 25 years for Boilers under 300 MBTU/h. Historically, large boilers have typically exceeded their assumed EUL of 25 years. The boilers associated with this new measure, however, are much smaller, and do not yet have the proven history of large, conventional boilers. Furthermore, these smaller boilers are made of different, much thinner, materials than larger conventional boilers, suggesting that they may have a shorter EUL. Several sources suggest using an EUL for small boilers of 18–20 years.[10] Without a verified EUL assumption for boilers of this size, the Audit Team recommends that Union apply an EUL of 22 years (the midpoint of what other utilities use, 18–25 years) for boilers under 300 MBTU/h. The Audit Team also recommends that Union monitor the relevant literature for verifiable EUL assumptions for boilers of this size. However, since Union had already filed a 25 year EUL for all boilers (which was accepted by the EAC), these recommendations for a 22 year EUL should be implemented for the 2012 program year.

Electricity Savings per Unit (Condensing Make-up Air Units)

In its 2011 proposal to OEB, Enbridge correctly states that the electrical demand of the motor is a function of the motor's horsepower, percent motor loading, motor efficiency, and control factor. Enbridge does not, however, show the values it used for these parameters. The relationship between fan speed and power is well documented (often referred to as the "fan law").[11] The fan law states that when an electric motor is powering a fan under ideal conditions, the fractional power use is equal to the fractional fan speed, raised to the third power. However, due to inefficiencies, savings are more accurately modeled by raising the fractional fan speed to the 2.7 power.

$$\frac{Power_{New}}{Power_{Baseline}} = \left(\frac{Fan\ Speed_{New}}{Fan\ Speed_{Baseline}}\right)^{2.7}$$

Applying this principle, typical values of motor efficiencies for small motors, and a motor load of 65 percent, results in electricity savings that are much greater than originally estimated by Enbridge. The Audit Team recommends changing the annual per unit electricity savings assumption used in the Audit Tool and reported in Union's

[10] See, for example, GDS Associates. 2009. *Natural Gas Energy Efficiency Potential in Massachusetts*. GasNetworks. April. California Public Utilities Commission. 2008. *Database for Energy Efficient Resources*. Retrieved from http://www.deeresources.com/.

[11] See, for example, Prachyl, S. 2010. *Variable Frequency Drives and Energy Savings*. Siemens; Energy Star. 2012. *Variable Speed Fan Drives*. Retrieved on May 14, 2012 from http://www.energystar.gov/index.cfm?c=power_mgt.datacenter_efficiency_vsds.

Draft DSM 2011 Annual Report from 0.48 kWh/cfm to 1.09 kWh/cfm (see Table 9) for select Condensing Make-Up Air Units.

Table 9. Condensing Make-up Air Units (Electricity Savings Rate)

Program/Measure		Draft DSM 2011 Annual Report Annual Electricity Savings Rate	Audited Annual Electricity Savings Rate
Condensing Make-up Air Units Other Commercial Efficiency 1,700–5,999 cfm and greater than or equal to 6,000 cfm		0.48 kWh/cfm	1.09 kWh/cfm
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings Impact (m^3)**
+ $10,482	+ $415	N/A	N/A

C. Custom Projects

For the Commercial and Distribution Contract Custom projects, the Audit Team reviewed the realization rates and engineering reports (including input assumptions and values) that Union used to estimate the savings presented in the Draft DSM 2011 Annual Report. The Audit Team coordinated with the statistical and engineering consultants responsible for conducting the third-party verifications of the savings and realization rates used in preparing the Draft DSM 2011 Annual Report. The Audit Team also reviewed specific issues raised by the EAC in their review of the Draft DSM 2011 Annual Report.

1. Engineering Review

Commercial Custom Projects

For Commercial Custom projects, the Audit Team reviewed the Michaels verification study on Union's Commercial and Industrial Custom projects.[12] The stated purpose of the Michaels study was to verify the reported savings, project costs, and EULs on a representative sample of Union's Commercial Custom projects. Michaels also performed a desk review of each project's documentation and savings calculations, and completed on-site project verifications. The purpose of this component of the audit is to:

- Review the engineering approach.
- Ensure compliance with engineering best practices.
- Verify calculated savings.
- Compare claimed savings from natural gas, water, and electricity to the savings Michaels found as a result of its review of these projects.

Of the 25 projects included in its verification study, Michaels reviewed 20 of them using phone interviews; Michaels reviewed the other five projects using on-site visits to verify

[12] Michaels Energy. 2012. *Union Gas 2011 Commercial and Industrial Markets Project Verification Final Report*. March.

installed equipment and operating parameters. The on-site reviews used the current operating information to calculate the corresponding natural gas, water, and electrical savings. To review the results of the Michaels verification study, the Audit Team followed these steps:

- The Audit Team reviewed the documentation and calculations reported in the Michaels verification study.
- Where engineering approaches or methodologies were unclear, the Audit Team communicated with Michaels for clarification.
- Where data from Michaels were insufficient to justify its approach, or other errors were uncovered, the Audit Team made recommendations for changes in the Draft DSM 2011 Annual Report.

After completing the steps described above, the Audit Team has five recommendations for changes to the inputs used in calculating savings from Commercial Custom projects:

- **Project 203 (Natural Gas Savings).** In calculating the savings associated with this project, the Michaels study inaccurately interpreted the assumptions used in the baseline data, and subsequently generated an overly conservative model. After clarifying and adjusting the assumptions and baseline data, the natural gas savings increase by 24 percent from 45,217 m^3 to 56,074 m^3.

- **Project 207 (Electrical Savings).** Projected electrical motor savings are based on the time a motor is used, and the average load placed on that motor during that time. The Michaels study uses a 90 percent load factor to calculate electrical savings. The Audit Team's experience has shown that a load factor of 70 percent is more realistic. Changing the load factor from 90 percent to 70 percent reduces calculated savings by 23 percent, from 118,715 kWh/year to 91,711 kWh/year.

- **Project 210 (Natural Gas Savings).** Insulating the thermal oil heater tank and the distribution piping can conserve natural gas. For this project, the Michaels study overestimated the size of the heater tank. Using a more accurate size reduced natural gas savings by 55 percent, from 156,237 m^3 to 70,140 m^3.

- **Project 238 (Natural Gas Savings).** The Michaels study used static air density (which is a function of temperature) to calculate savings. In this instance, applying dynamic air density values alongside variable heat recovery effectiveness (which is a function of actual temperature difference) is more appropriate. Applying these new assumptions increases the natural gas savings from 6,684 m^3 to 48,772 m^3.

- **Project 240 (Natural Gas Savings).** When steam traps leak, there are repercussions throughout the boiler system. Most notably, feed water flow must increase by more than just the amount lost from the leaks – it must also increase to account for the increased volume of boiler blowdown. Conversely, reducing steam leaks reduces the amount of feed water that must be heated (and natural gas that is required to heat the feed water) by more than just the volume of water lost to the leaks. Assuming a typical blowdown rate of 10 percent results in an increased savings of natural gas by 13 percent, from 105,132 m^3/year to 118,569 m^3/year.

- **Project 240 (Water Savings).** As explained above, reducing steam leaks reduces the amount of feed water by more than just the volume of water lost to the leaks because it also reduces the amount of water lost through boiler blowdown. Assuming a typical blowdown rate of 10 percent results in an increased water savings 12 percent, from 318,876 L/year to 356,471 L/year.

Table 10 summarizes the changes described above. The table shows the estimated savings for each of the projects described above, Michaels' verified savings and the audited savings

Table 10. Audit Results for Commercial Custom Projects

Project	Technology	Ex Ante Savings Volume	Verified Savings Volume	Project Savings Rate	Audited Savings Volume	Audited Project Savings Rate
203 Gas (m^3)	HVAC	66,623	45,217	67.9%	56,074	84.0%
207 Electrical (kWh)	Process	69,031	118,715	172.0%	91,711	132.9%
210 Gas (m^3)	Process	240,179	156,237	65.1%	70,140	29.2%
238 Gas (m^3)	HVAC	229,185	6,684	2.9%	48,772	21.0%
240 Gas (m^3)	Process	100,428	105,132	104.7%	118,569	118.1%
240 Water (L)	Process	308,942	318,876	103.2%	356,471	115.4%

Note: The Project Savings Rate value is the ratio of the Verified Savings to Ex-Ante Savings. The Audited Project Savings Rate value is the ratio of the Audited Savings to Ex-Ante Savings.

Distribution Contract Custom Projects

For Distribution Contract (DC) Custom projects, the Audit Team reviewed the Diamond verification report of Union's DC Custom projects.[13] Diamond completed on-site verification visits to each of the 13 Custom projects included in the sample. The facilities included in the Diamond verification study ranged from an oil refinery to a university campus to a large greenhouse facility. The purpose of this component of the audit is to:

- Review the data and assumptions (including incremental costs and EUL) used to describe baseline and upgraded equipment.
- Review the energy savings calculations for natural gas, water, and electrical savings.

To review the results of the Diamond verification study, the Audit Team followed these steps:

- The Audit Team reviewed the documentation and calculations in the Diamond verification study.
- Where engineering approaches or methodologies were unclear, the Audit Team communicated with Diamond for clarification.
- If data from Diamond were insufficient to justify its approach, or other errors were uncovered, the Audit Team made recommendations for changes in the Draft DSM 2011 Annual Report.

[13] Diamonds Engineering. 2012. *2011 Evaluation of Distribution Contract Custom Projects*. March.

After this review, Diamond and the Audit Team resolved all questions. The Audit Team agrees with the energy savings calculated by Diamond, and has no recommendations for adjustments to the realizations rates from the Diamond verification study.

General Recommendations for Custom Projects

The realization rates reported in the Michaels and Diamond verification studies suggest that the information available for the small Commercial Custom projects is less thorough and less reliable than the information available for large Custom projects. Nine of the Commercial Custom projects have realization rates of 25 percent or less. To improve the information available for Commercial Custom projects, the Audit Team makes the following recommendations:

- Collect pre-project documentation of whether the project involves an expansion of production capacity.
- Collect pre-project utility history for the facility or meter where the project will be affected.
- Record baseline conditions (operating hours, operating usage, baseline equipment configuration, etc.).
- Collect post-project documentation of what equipment and operating changes were made.
- Record upgraded condition (operating hours, operating parameters, upgraded equipment configuration, etc.).

2. Realization Rates

Audited Realization Rates

Realization rates are estimated parameters used to extrapolate audited savings from a *sample* of Custom projects to *all* Custom projects. These rates affect claimed program outcomes such as energy savings, incremental costs, and EULs. As such, realization rates affect the calculation of TRC, SSM, and LRAM. The Audit Team recalculated the realization rates based on the audited values of savings for the Commercial Custom projects listed above. These audited realization rates are listed in Table 11. Since the Audit Team found no reason to change verified savings in the sample of DC Custom projects, the realization rates for DC Custom savings remain unchanged from those reported in the Draft DSM 2011 Annual Report.

Table 11. Audited Realization Rates

Program/Measure		Draft DSM 2011 Annual Report Realization Rate	Audited Realization Rate
Natural Gas Savings – Commercial Custom		0.665	0.659
Natural Gas Savings – DC Custom		1.096	1.096
Water Savings – Commercial Custom		0.862	0.863
Water Savings – DC Custom		1.076	1.076
Electricity Savings – Commercial Custom		0.817	0.797
Electricity Savings – DC Custom		1.078	1.078
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings**

			Impact (m^3)
-$84,114	-$3,329	-$450	-20,201

Precision Level Audit

Navigant Consulting measured precision levels for realization rates associated with Union's Commercial Custom and DC Custom projects and reported them in its April 18, 2012 memorandum (herein referred to as "Navigant Precision Memo"). The Audit Team's initial efforts focused on determining if the realization rates Union reports in its Draft DSM 2011 Annual Report do, in fact, fall within the precision levels reported in the Navigant Precision Memo. The Audit Team notes that the precision levels Navigant reports (reproduced in Table 12 below) are *realized precision levels*, which are the relative precision levels attained after the sample is drawn and verified. This distinction is made from the ex-ante precision levels assumed in the sampling methodology for determining the sample size. Navigant sets that ex-ante level at 15 percent.

The Audit Team verified that the reported realization rates for natural gas and water savings for Custom projects fall within the calculated precision levels put forth in the Navigant Precision Memo. However, realization rates for electricity savings fall below the precision interval for those rates. Table 12 compares realization rates reported in the Draft DSM 2011 Annual Report with those reported in the Navigant Precision Memo.

Table 12. Comparison of Reported Realization Rates to Navigant's Achieved Precision Levels

Savings Type	Reported Realization Rate	Navigant Realization Rate	Navigant Achieved Precision Level	Precision Interval
Natural Gas Savings				
Commercial Custom	0.6649	0.73	14%	0.628–0.832
DC Custom	1.0962	1.06	15%	0.901–1.219
Water Savings				
Commercial Custom	0.8624	0.86	1%	0.851–0.869
DC Custom	1.0762	1.07	36%	0.685–1.455
Electricity Savings				
Commercial Custom	0.8166	0.92	8%	0.846–0.994
DC Custom	1.0775	1.48	4%	1.421–1.539

Source: Union Gas. 2012. *Draft DSM 2011 Annual Report*. April. Pg. 78-79; Navigant Consulting. 2012. *Navigant Precision Memo*. April 18, 2012.

Notes: ECONW calculated the upper and lower bound values using Navigant's realization rates and precision levels.

Navigant produced new Achieved Precision Levels with the audited savings number. The new calculations did not change from previous calculations in any manner of significant digits already reported. Thus, Navigant's previously reported rates and precision numbers do not vary with audited values.

Given that the realization rates reported in the Draft DSM 2011 Annual Report for electricity savings were outside—i.e., below—the precision levels reported in the

Navigant Precision Memo, the Audit Team reviewed the methodologies used to calculate each set of realization rates. The Audit Team noted the differences in the realization rates used in the Audit Tool (the values in the first column in Table 12) and those in the Navigant Precision Memo (the values in the second column in Table 12), for both gas and electricity savings; especially since the reported realization rates for electricity fell below the precision bound. To better understand the source of the difference between these two sets of rates, the Audit Team reviewed the process by which Custom projects are selected and verified, as well as the methodology used to estimate the reported realization rates.

The process Union employed for verifying Custom projects for the Draft DSM 2011 Annual Report was consistent with the process it has employed in the past. Specifically, for the Draft DSM 2011 Annual Report, the verification process consisted of the following steps:

- Navigant drew a stratified random sample of projects to verify. This sampling method has been approved by Union and the EAC.[14]
- Data for the sample projects were provided to two consultants (Diamond Engineering Company and Michaels Energy) who verified the utility savings for the Draft DSM 2011 Annual Report. These consultants reported the verified savings to Union, as well as their calculated realization rates.
- Union delivered the verification data to Navigant. Navigant then computed its estimate of the precision levels, and the realization rates that generate those precision levels
- Union reported the realization rates from the engineering consultants and the precision levels from Navigant in the Draft DSM 2011 Annual Report.

Diamond and Michaels estimated the realization rates reported in the Draft DSM 2011 Annual Report. To calculate these realization rates, they divided the audited utility savings from the sample of projects by the claimed savings for those projects. In estimating these realization rates, the two firms treated the drawn sample of verified projects as a simple random sample from the population of all Custom projects. Navigant estimated realization rates, as well as relative precision levels, by ratio estimation methods (these realization rates are not reported in the Draft DSM 2011 Annual Report). This method incorporates weighting factors, constructed from the stratification process, to account for the heterogeneous population of Custom projects. The Audit Team has reviewed Navigant's methods and has found them to be accurate and correct.

From a statistical standpoint, the Audit Team finds that the differences between the realization rates reported in the Draft DSM 2011 Annual Report and those reported in the Navigant Precision Memo are due to the methodologies used to estimate them. Given the accepted stratified sampling procedure used to generate the verified project sample, Navigant's method of estimation is a sound practice, and produces the best,

[14] Navigant Consulting. 2008. *Sampling Methodology for Engineering Reviews of Custom Projects.* April.

unbiased estimate of the realization rates for the population.[15] Moreover, Navigant has used this methodology in similar verification studies for utility DSM programs elsewhere.[16] The Audit Team understands that the methodologies used for calculating realization rates are being investigated for the first time. Therefore, the Audit Team understands that the current process of using realization rates derived from one statistical method, and precision values from another, is a product of inherited practice. However, the current procedures can easily be streamlined to consolidate responsibilities.

The Audit Team recommends that Union make the following changes to the process of calculating realization rates for the 2012 program year:

- Draw the sample of Custom projects to be verified.
- Verify the savings of those projects.
- Calculate the realization rates from the verified data using the appropriate sample stratification weights and use the rates in the Draft DSM Annual Report.
- Audit verified savings.
- Re-calculate the realization rate from the audited data using appropriate sample stratification weights and use these rates in the Final DSM Annual Report.
- Conduct confidence precision levels after audited savings are calculated.

The Audit Team believes that these steps will improve the statistical accuracy of the realization rates, and would be in line with industry best practices. Given limited resources for DSM evaluation and verification, the Audit Team recommends improving coordination among Union staff and consultants to reduce duplicative and potentially unnecessary efforts regarding the estimation of realization rates.

The Audit Team recognizes that the audited realization rates presented in Table 12 are calculated from the methodology used by the engineering consultants. The Audit Team also notes that the TRC, SSM, LRAM, and gas savings number reported herein do no reflect the adoption of the stratified realization rates. Since applying the stratified realization rates does not affect capped SSM, the recommendation to adopt these rates should be bundled with the recommendations to improve the process starting in the 2012 program year.

V. SCORECARD AUDIT

Up to this point, this report has focused on TRC-related programs. In addition to these programs, Union implements other programs (with separate funding). This section contains the Audit Team's review of the Market Transformation Scorecard and the Low-Income Weatherization Scorecard.

[15] Expert panels from other utilities have reviewed and approved this method. See, for example, TecMarket Works. 2004. *The California Evaluation Framework*. Project No. K2033910. Pg. 356. For discussion on the unbiased properties of the procedure, see, for example, Lohr, S. 1999. "Sampling: Design and Analysis."

[16] Navigant Consulting. 2011. *Energy Efficiency/Demand Response Plan Year 2*. AEP Ohio. March. Retrieved on May 15, 2012 from http//dis.puc.state.oh.us/TiffToPDf/ A1001001A11C16B02413C41830.pdf.

A. Market Transformation Scorecard

The Audit Team reviewed the work Union has completed to show progress on its Market Transformation Program. Since 2007, Union's Market Transformation Program has targeted Drain Water Heat Recovery (DWHR) technology, and as stated in the Draft DSM 2011 Annual Report, Union will exit the program this year. Union's methods for measuring program performance, as presented in the Draft DSM 2011 Annual Report, are consistent with its approach in 2010.

Union relied on two metrics to measure performance: (1) the number of participating builders as tracked by the program, and (2) the overall number of units installed as a percentage of residential new attachments as tracked by the program and available residential new attachments for Union's franchise. Table 13 summarizes the results from the Market Transformation Scorecard, as reported in the Draft DSM 2011 Annual Report (with a revision to the overall score from 150/150, as reported in the Draft DSM 2011 Annual Report, to 150/100).

The Audit Team assumes that the actual results reported in the Scorecard (137 participating builders and 2,691 units installed) are tracked by internal program databases, and that they are accurate. The Audit Team did not attempt to verify the builder enrollment or units installed as part of this audit. The metric value levels (reported in the second, third, and fourth columns of the table) show the required results needed to meet 50, 100, and 150 percent of the performance metric. In both cases, the actual results exceeded the 150 percent metric value level.

Table 13. 2011 Market Transformation Scorecard Results (Revised)

Metric Weighting	Metric Value Levels			Weight	Actual Results	Payout %	Score
	50%	100%	150%				
Participating Builders	122	128	133	20%	137	150	30/20
Units Installed (new build) as a percentage of 2011 residential new attachments	15.72% or 2011 units	17.72% or 2267 units	19.72% or 2522 units	80%	2691	150	120/80
Overall Results					$500,000	150%	150/100
Source: Union Gas. 2012. Draft DSM 2011 Annual Report. April. Pg. 70.							

The Audit Team also reviewed the actions taken on recommendations from past audits. In 2010, Union removed two metrics from its analysis of program performance. The two metrics described customer and builder awareness of the technology as determined through a market survey. The 2010 Audit recommended that Union re-institute the annual awareness surveys, as awareness is a leading indicator of market transformation. If, in the future, Union initiates a new Market Transformation Program, the Audit Team recommends that Union re-instate efforts to measure changes in awareness. The Audit Team does not recommend that Union use awareness metrics to claim savings, but rather, emphasizes the usefulness of tracking changes in awareness over time.

B. Low-Income Weatherization Scorecard

As stated in the Draft DSM 2011 Annual Report, Union received additional funding for a new incremental Low-Income Weatherization Program. Savings from this program are not factored into the SSM and LRAM calculations and do not influence TRC. To evaluate this program, Union creates a Scorecard (like the one for the Market Transformation Program). Table 14 summarizes the results from the Low-Income Weatherization Scorecard, as reported in the Draft DSM 2011 Annual Report. The Audit Team assumes that the actual results reported in the Scorecard (450 participants and 514,499 m^3 in natural gas savings) are tracked by internal program databases, and that they are accurate. The Audit Team did not attempt to verify enrollment or savings as part of this audit. The metric value levels (reported in the second, third, and fourth columns of the table) show the required results needed to meet 50, 100, and 150 percent of the performance metric. After weighting the results of the two metrics, Union scored 135.9/100, for a total incentive payout of $543,600.

Table 14. 2011 Low-Income Weatherization Scorecard Results

Metric Weighting	Metric Value Levels			Weight	Actual Results	Payout %	Score
	50%	100%	150%				
Weatherization Participants	300	400	450	50%	450	150	75/50
Total Natural Gas Savings (m^3)	366,000	488,000	549,000	50%	514,499	121.7	60.9/50
Overall Results					$543,600	136%	135.9/100
Source: Union Gas. 2012. Draft DSM 2011 Annual Report. April. Pg. 28.							

VI. SUMMARY

As per Union's request for audit, in regulation with OEB guidelines, ECONW was engaged in conducting an independent, third-party audit of Union's Draft DSM 2011 Annual Report. To conduct the audit, the Audit Team reviewed Union's 2011 savings estimates and the calculations, assumptions, background materials, and other documentation (including relevant files supporting Custom projects) supporting the results presented in the Draft DSM 2011 Annual Report.

This report presents the Audit Team's recommendations for changes to the Draft DSM 2011 Annual Report as well as procedural changes for future verification and reporting. To summarize, the Audit Team recommends the following:

- Change the adjustment factors for the Commercial Multi-Family HWC Program to match those identified in the SeeLine verification study.
- Change the adjustment factors for the Commercial Non Multi-Family HWC Program to match those identified in the Energuy verification study.
- Regarding the current use of natural gas hot water heaters, change all "Don't Know" responses collected through surveys supporting the Beslin verification study to "No" responses, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.
- Assume that all "Don't Know" responses collected in the Beslin verification study related to the use of low-flow showerheads indicate no use of low-flow

showerheads, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.

- Correct the equations used to calculate the adjustment factors for the ESK Residential Push/Pull/Install Replacement measures.
- Change the adjustment factors for the ESK Residential Push Showerhead Replacement measures to accurately reflect those reported in Beslin's verification study.
- For the 2012 program year, begin tracking the number of two-stage IR (infrared) heater units installed, and use the gas savings assumptions for each type of heater rather than the blended gas savings across heater types.
- Investigate methods to disaggregate the blended incremental cost factor for IR heaters.
- Work with the TEC to finalize a free-ridership rate for new measures initiated in 2011 and develop a process for estimating free-ridership rates for new measures in the future.
- Decrease the EUL assumption for Condensing Boilers under 300 MBTU/h from 25 years to 22 years until the EUL of 25 years for this class of boilers is justified. Change the annual electricity savings rate for Condensing Make-up Air Units to accurately reflect industry practice.
- Use the audited realization rates to reflect the changes in savings for six of the Commercial Custom projects.
- For the 2012 program year, calculate realization rates using stratification weights from the sample drawn for verification. This approach is in line with industry best practices, and will improve the statistical accuracy of the realization rates.
- Given limited resources for DSM evaluation and verification, the Audit Team recommends improving coordination among Union staff and consultants to reduce duplicative and potentially unnecessary efforts regarding the estimation of realization rates.
- To improve the information available for Commercial Custom projects, the Audit Team makes the following recommendations:
    - Collect pre-project documentation of whether the project involves an expansion of production capacity.
    - Collect pre-project utility history for the facility or meter where the project will be affected.
    - Record baseline conditions (operating hours, operating usage, baseline equipment configuration, etc.).
    - Collect post-project documentation of what equipment and operating changes were made.
    - Record upgraded condition (operating hours, operating parameters, upgraded equipment configuration, etc.).

Table 15 summarizes how adjustments and recommendations identified in this report impact the results presented in the Draft DSM 2011 Annual Report. In some instances, the recommendations listed above do not represent specific action items for the Draft DSM 2011 Annual Report. Those recommendations are not reflected in Table 15, but rather represent recommendations for future actions relevant to next year's evaluation.

Table 15. Summary of Adjustments

Measure	Description of Change	TRC Impact	SSM Impact (no cap)	LRAM Impact	Natural Gas Savings (m^3)
Prescriptive Measures					
HWC Commercial Multi-Family	Adj. Factor	+$130,816	+$5,178	+$497	+20,533
HWC Commercial Non Multi-Family	Adj. Factor	+$13,018	+$515	+$47	+2,034
ESK Residential Push/Pull/Install	Adj. Factor	–$271,746	–$10,756	–$1,720	–65,447
Quasi-Prescriptive Measures					
Condensing Make-up Air Units	Electricity Savings	+$10,482	+$415	N/A	N/A
Custom Projects					
All Custom Adjustments	N/A	-$84,114	-$3,329	-$450	-20,201
Total (All Adjustments)	N/A	-$201,544	-$7,977	-$1,626	-63,079

Table 16 summarizes the overall impacts on TRC, SSM (no cap), SSM (with cap), LRAM, and natural gas savings from all of the recommendations identified and discussed in this report.

Table 16. Audit Adjustments to TRC, SSM, LRAM, and Natural Gas Savings

Account	Draft DSM 2011 Annual Report	2011 Audit Value	% Change
Net TRC	$379,580,963	$379,379,419	-0.05%
SSM (no cap)	$9,773,825	$9,765,848	-0.08%
SSM (with cap)	$9,243,367	$9,243,367	No Change
LRAM	$822,251	$820,625	-0.20%
Natural Gas Savings (m^3)	163,766,311	163,703,231	-0.04%

APPENDIX A. KEY MEETINGS

Meetings and Participants

Kick-off Meeting - March 21, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter Randy Pozdena	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Josh Bachman	Jeff Hare	Craig Phillips	
Audit Discussion - April 11, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare	Craig Phillips		
Audit Discussion - April 18, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Julie Girvan	Kai Millyard		
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare	Craig Phillips		
Audit Discussion - May 2, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Julie Girvan	Kai Millyard		
	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare			
Audit Discussion - May 9, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Craig Phillips			
Review Draft Audit - May 23, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Craig Phillips			
Review Draft Audit - May 30, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare	Craig Phillips		
Review Draft Audit – June 11, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	
Cascade	Jeff Hare	Craig Phillips		

APPENDIX B. DOCUMENTS REVIEWED

Ontario Energy Board

Phase 1 - Decisions With Reasons (2006)

Demand Side Management Guidelines For Natural Gas Utilities (2008)

Union Gas Limited

2011 DSM Draft Annual Report

2010 DSM Annual Report and Audit

2010 Audit Summary Results And Responses

EB-2010-0055 - 2011 Demand Side Management Plan – Update

EB-2010-0055 - Amendment to the 2011 Demand Side Management Plan – Incremental Low-Income Demand Side Management Plan

C/I Marketing - Program Concept: Condensing Make-up Air (MUA)

C/I Marketing - Program Concept: Condensing Boiler <300 MBTU/Hr

Verification Reports

Diamond Engineering Company

2011 Evaluation Of Distribution Contract Custom Projects

Beslin

Final Report ESK—Residential—Program Install Initiative (2011)

Final Report ESK—Residential—Push Initiative (2011)

Final Report ESK—Residential—Pull Initiative (2011)

Final Report ESK—Residential— Replacement Program (2011)

Final Report ESK-Helping Homes Conserve-HHC-Program Low-Income Initiative (2011)

Survey Instruments

Seeline

2011 Commercial Multi-Family Hot Water Conservation (HWC) Program

Energuy

Verification Report For Hot Water Conservation Commercial Non Multi-Family

Michaels Energy

Michaels No.: UB511AAN Union Gas 2011 Commercial And Industrial Markets Project Verification Final Report.

Navigant

Measures and Assumptions Demand Side Management (DSM) Planning. Appendix C: Substantiation Sheets

Estimated Realization Rates with related Confidence and Precision for Gas, Electricity and Water - 2012 Custom Projects

Infrared Heater Substantiation Document

Other Documents

Enbridge Gas

EB-2011-0254: Enbridge Gas 2012 Substantiation Documents For New And Revised Measures

Agviro

Assessment Of Average Infrared Heater Savings. RFP#: 04-P7

Nexant

Market Study Of Natural Gas Fired Infrared Heaters

ASHRAE

Service Life Data Query: Boiler

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 6, pages 24

Preamble: Union indicates that customers will be provided a wide variety of material aimed at building an increased awareness of energy-efficiency and benefits.

a) For large energy intensive customers such as gas-fired generators, is Union of the view that the potential for higher profits is insufficient for customers to be aware of the potential for energy efficiency?

b) Given that Union has a number of brand new state-of-the-art combined cycle generators situated in its franchise, what specific material has Union developed that would assist these customers? Please provide copies of these materials.

Response:

a) For large energy intensive customers such as gas-fired generators, Union is of the view that the potential for higher profits would create awareness for the potential for energy efficiency. However, awareness in and of itself does not necessarily result in the organization implementing projects due to limitations in time and resources.

b) In general, Union does not produce industry specific material. The materials produced by Union are intended to highlight and share best-practices cross-functionally regardless of Industry type. Imperial Oil and H.J. Heinz Company of Canada are two examples of customers, with different processes, who champion energy-efficiency through a continuous improvement approach and wished to share their successes and learnings with all Union Gas customers through development of Enercase studies.

Link to Union Gas website:
http://www.uniongas.com/business/savemoneyenergy/index.asp#5

Eight tell-tale signs your power generation profits are disappearing
http://www.uniongas.com/business/savemoneyenergy/IdentifyingNGSavingsPowerGen.asp

Steam System Performance
http://www.uniongas.com/business/savemoneyenergy/pdf/SteamPerformanceSellSheetSept2011.pdf

Imperial Oil - Steam System Efficiencies – Enercase
http://www.uniongas.com/business/communicationcentre/successstories/pdfs/ImperialOilEnercaseWeb.pdf

H.J. Heinz Company of Canada – Steam System Performance – Enercase
http://www.uniongas.com/business/savemoneyenergy/pdf/SteamSysWeb.pdf

Union also offers educational sessions and training including:

- Canadian Boiler Society – Spring & Fall 2012
- Steam System Training Level I & Level II offered to all customers – Fall 2012
- Process Integration Training offered to all Large Volume customers with NRCan Winter 2013

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 6.5, pages 26

Preamble: Union states that: "Energy use is typically not considered a core production management system metric as energy is widely viewed as a "cost of doing business"."

a) Please confirm that gas-fired generators consume tens of millions of dollars of natural gas each year.

b) Please confirm that any company that consumes this amount of gas, that energy management is central to their operation. If not confirmed please explain.

c) Please provide a detailed list of the programs in Union's full suite of offerings for these large state-of-the-art gas-fired generator customers.

Response:

a) Confirmed.

b) No, Union has found an organization's focus on energy management is directly correlated to cost of energy as a percentage of production costs.

Where natural gas is a large component of the overall cost of production for customers who use natural gas as a primary feedstock (e.g. gas-fired generators or fertilizer manufacturers), it would be expected that energy management is a central component to their operation. However, the cost of natural gas as a percentage of total cost to produce a product is relatively small for large volume customers who do not use natural gas as a primary feedstock. For example, natural gas use in the steel industry represents less than 5% of their total cost of production.

It has been Union's experience that all large volume customers employ two methods to manage energy and energy costs. The first is to reduce the cost of the purchased input and the second is to increase or maintain the output per unit of purchased input.

For these large volume customers, energy efficiency is only one of many potential options available to achieve lower costs and hence higher profits. Union has also

frequently observed situations where energy efficiency opportunities have not been addressed due to competing alternatives for the customer's scarce resources.

c) Please see Exhibit A, Tab 1, p 23 to 26 Sections 6.3, 6.4 & 6.5.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Section 7, pages 31

Preamble: Union states that offering an opt-out program violates the well-established principles of rate class rate making

a) Please confirm that section 8.2 of the OEB Guidelines did not mandate that Union was required to offer large volume customers any DSM programs, and that Union has voluntarily decided to offer large volume customers these services.

b) In light of the feedback received from many individual customers and the feedback from the various associations representing customer groups opposing the DSM program, please explain why Union continues to propose a DSM program for each of T1, T2 and Rate 100 rate classes.

c) Is there anything preventing Union from establishing a non-regulated affiliate to offer large volume customers energy efficiency programs on a "for-profit basis" and removing the cost of the DSM program from its distribution rates?

Response:

a) Confirmed.

b) During the 2012 consultation in developing the Large Volume DSM Plan, Union did not receive feedback from many individual customers or various associations opposing the program. One association and some customers, primarily power generators, expressed the desire for an opt-out mechanism. The majority of customers' support the continuation of the program as identified in the feedback received (Please see the "As It Was Heard Report" provided in Appendix C for Rate T1 and Appendix E for Rate 100). Union's additional rationale for continuing to propose the DSM program is provided at Exhibit B5.3 a) and B5.3 b).

c) Union has not considered or analyzed the implications of establishing an unregulated affiliate to offer large volume energy efficiency programs. Union has developed a large volume DSM plan consistent with current DSM guidelines and the accepted principles of class rate making.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Appendix A

Preamble: Union provides information on Self-Directed or Opt-Out Programs

a) Please indicate if the survey results were based on an 'internet' or third party review of available material or if Union conducted a first-hand review all of these jurisdictions or companies.

b) Please provide a list of all of the Canadian and US companies or jurisdictions that were specifically surveyed.

c) For the companies or jurisdictions that were surveyed, please indicate which companies or jurisdictions excluded DSM programs for one or more of their large volume rate classes.

d) In the study performed by Union (Chart A), Union points out that the states of Vermont, Wyoming, Kentucky, Missouri, Ohio, North Carolina, South Carolina, Texas and Virginia all have some form of DSM Opt-Out program. Did Union review the regulatory programs of these jurisdictions and/or speak with the companies offering these opt-out programs? If so please explain how these 9 jurisdictions are able to offer these programs in light of the concerns that Union expressed about rate class ratemaking?

e) For each of the companies or jurisdictions that offered a self-directed DSM program please provide the net percentage of the funds that were directly available to customers for self-directed DSM programs as a percentage of the total DSM costs paid by ratepayers within the applicable rate class. The total funds paid by ratepayers should include all program overheads, incentive payments to the utilities to offer such programs or other costs not directly involved in delivering energy-efficiency programs.

Response:

a) The review conducted by Union was an environmental scan. Union did not conduct a formal survey for its jurisdictional review. Union's review was conducted based on

third party material available via the internet and follow-up clarification communications with certain jurisdictions.

b) All of the US jurisdictions included in the review are listed at Exhibit A, Tab 1, Appendix A. All Canadian provinces and territories were included as part of the internet review.

c) Union is not aware of large volume rate classes that have been excluded from DSM Programs offered in the jurisdictions reviewed. However, Union is aware that Texas excludes for-profit customers that take electric service at the transmission level from participating in utilities' energy efficiency programming.

d) As part of its jurisdictional review, Union did not specifically review the regulatory programs nor rate setting provisions of jurisdictions that offer opt-out programs. The structure of opt-out programs vary in each jurisdiction as outlined in Exhibit A, Tab 1, Appendix A, Chart.

e) Union does not know of the net percentage of funds directly available to customers for self-directed DSM programs in the various jurisdictions.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPrO")

Reference: Exhibit A, Tab 1, Appendix B
Preamble: Union provides some of the program incentives on slide 8. APPrO would like to better understand these incentives proposed.

a) For customers that would typically be eligible for Rate 100 or T2, and for each of the 10 program elements shown on slide 8, please provide the average cost of implementing these program elements (where reasonably possible) and show the total cost of implementing the program, incentive amount provided by Union, the amount that the customer would fund on its own and the percentage funded directly by each of Union through ratepayer funded DSM and the percentage funded directly by the customer.

Response:

Union does not track the cost of implementing at the program element level. Union does track the incentives provided and customer project cost at the measure level. Please see the table below for incentive funding provided by Union, the amount the customer would fund on its own and the percentages funded directly by Union and the customer accordingly.

Rate T1 / Rate 100 - 2011 Results				% Funding - average		$ Funding - average	
Offering	**# of Projects**	**Incentive $ Provided By Union**	**Customer Project $**	**By Union**	**By Customer**	**By Union**	**By Customer**
O & M	157	$ 1,989,254	$ 23,169,661	9%	91%	$ 12,670	$ 147,577
Capital	43	$ 1,180,959	$ 31,632,015	4%	96%	$ 27,464	$ 735,628
Engineering Feasibility	17	$ 104,373	$ 395,718	26%	74%	$ 6,140	$ 17,138
Process Improvement	33	$ 444,509	$ 1,394,046	32%	68%	$ 13,470	$ 28,774
Steam Trap	20	$ 80,243	$ 252,633	32%	68%	$ 4,012	$ 8,620
Education	2	$ 16,000	$ 45,185	35%	65%	$ 8,000	$ 14,593
	272	**$ 3,815,338**	**$ 56,889,258**				

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AfTl/p.7, lines 9 through 15. The evidence describes Union's proposed "Direct Access" plan for proposed Rate T2 and for Rate 100 customers. The proposal is to provide these customers with first access to *"the full customer incentive budget they pay in rates"*.

Reference: Ex.AfTl/p.l0, Figure 1. Figure 1 provides a graphic breakdown of the Rate T2/Rate T1 /Rate 100 DSM budget by expense category.

Please confirm that the proposal is to provide each T2 and Rate 100 customer with "direct access" to 59% of the amount that they pay in delivery rates on account of Union's DSM program (i.e. net of LRAM and shareholder incentive amounts).

Response:

The customer incentive budget represents 59% of the DSM amount budgeted in rates for Union's Large Volume rate classes. At a rate class level, the customer incentive budget each Rate T2 and Rate 100 customer will have "direct access" to is 54% for Rate T2 and 61% for Rate 100. The percentage is not the same for each rate class as the Low-income budget is allocated to rate classes differently than the Large Volume program and allocated Portfolio budget. The Low-income DSM budget is allocated based on Union's most recent Board-approved distribution revenue by rate class.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex. AfTl/p.9, Table 1

Please provide a table which includes the following information, by year from 2008 through 2012, for each of Rate T1 and Rate 100:

a) DSM costs included in rates (but excluding low-income costs for 2012).

b) LRAM amounts.

c) Shareholder incentive amounts.

d) DSMVA amounts.

Response:

Please see Attachment 1.

Filed: 2012-10-25
EB-2012-0337
Exhibit B6.2
Attachment 1

UNION GAS LIMITED
Rate Class Impacts of DSM
2008 to 2011 Actuals and 2012 Forecast
($000's)

Line No.	Particulars	Direct DSM in Rates	Indirect DSM	DSMVA in Deferrals	Audited SSM in in Deferrals	LRAM in Deferrals	Total
		(a)	(b)	(c)	(d)	(e)	(f) = (a+b+c+d+e)
	Rate 100						
1	**2008** (1)	1,521	264	(241)	2,988	(8)	4,523
2	**2009** (2)	1,699	264	254	1,714	46	3,977
3	**2010** (3)	1,896	264	541	1,735	66	4,502
4	**2011** (4)	2,112	264	(1,278)	705	85	1,887
5	**2012** (5)	1,572	-				1,572
	Rate T1						
6	**2008** (1)	1,068	187	1,328	1,397	8	3,989
7	**2009** (2)	1,194	187	1,963	2,241	29	5,614
8	**2010** (3)	1,332	187	1,012	1,419	35	3,985
9	**2011** (4)	1,484	187	2,880	4,402	70	9,022
10	**2012** (5)	3,669	-				3,669

Notes
(1) DSMVA & LRAM reflect the deferral account balance disposed of in EB-2009-0052, effective October 1, 2009.
(2) DSMVA & LRAM reflect the deferral account balance disposed of in EB-2010-0039, effective October 1, 2010.
(3) DSMVA & LRAM reflect the deferral account balance disposed of in EB-2011-0038, effective April 1, 2012.
(4) DSMVA & LRAM reflect proposed deferral account balances in EB-2012-0087.
(5) EB-2011-0327, Settlement Agreement, Appendix C.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AIT1/p.13, lines 11 and 1. The evidence provides the proposed allocation of DSM program budget between Rate T1 and the proposed Rate T2. The evidence provides reference to EB-2011 -0210 to indicate "consistency" of the proposed allocation with Union's evidence in its 2013 rate case. Further information on the proposed allocation is provided at Ex.AIT1/S1 of the instant application. However, no explanation of the rationale for the proposed allocation is provided .

Reference: EX.AIT1/Schedule 3. The evidence indicates that, relative to current T1 customers, if the proposed T2 rate class and Union's proposed budget allocation are approved, remaining T1 customers would see an increase in DSM costs included in rates (a doubling), while new T2 customers would see a decrease (of approximately 20%).

Please provide the rationale for the proposed allocation, illustrated by the supporting calculations.

Response:

The proposed DSM program budget allocation was derived at as follows:

1. The EB-2011-0210, 2013 Cost of Service forecast for Rate T1 was divided between proposed Rate T1 (39 customers) and proposed Rate T2 (20 customers).

2. The actual 2011 incentives paid out to the Rate T1 customers, now divided as described in 1) above, was used to determine the 2013 allocation of DSM program costs.

3. The result was a 45/55 split of DSM program costs between proposed Rate T1 and Rate T2.

Please see Attachment 1 for supporting calculations.

Attachment 1
2013 DSM Program Cost Allocation - Proposed Rate T1 & Rate T2

Particulars	2013 Forecast Customers		
	Rate T1	Rate T2	Total
	(a)	(b)	(c) = (a+b)
2011 Incentives Paid ($)	1,544,087	1,868,467	3,412,555
2011 Incentives Paid (%)	45%	55%	100%
2013 DSM Program Costs ($000's)	1,697	2,053	3,750

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AIT1/p.16, line 8. The evidence regarding the scorecard metric of cumulative natural gas savings makes reference to adjustment for "spillover".

a) Please confirm that Union has never had inclusion of a "spillover" adjustment approved by the Board.

b) Please provide the detailed rationale and supporting evidence that Union relies on for inclusion of a "spillover" adjustment in calculation of cubic meter savings for its proposed large volume customer scorecard metrics.

Response:

a) Confirmed. Union has never sought approval of a spillover adjustment by the Board. Spillover adjustments were not allowed as part of the 2007 to 2011 DSM Framework.

b) Section 7.1 of the DSM Guidelines (EB-2008-0346) outlines that Union has the option to request inclusion of spillover effects for any of its programs in the 2012 to 2014 Framework and can be assessed through Union's program evaluation and audit process. This process is outlined in the Joint Terms of Reference on Stakeholder Engagement included in Appendix B of the Settlement Agreement (EB-2011-0327) approved by the Board.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AIT1/p.17, lines 10 through 13. The evidence explains the proposed calculation of the "budget spent percentage" metric proposed for the Rate T2/Rate 100 Direct Access program.

Please confirm that the referenced evidence indicates that the minimum 2014 metric target levels will be the 2013 proposed target levels.

Response:

Confirmed.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AIT1/p. 17, lines 24 and 25 and p.18, lines 20 *et seq.* The evidence proposes a 30% downward adjustment from the 2012 cumulative gas savings target for the T1 rate class to derive a proportional Rate T2/Rate 100 cumulative savings target.

a) Please indicate whether incentive funding for energy plans and energy monitoring was available to T1 /Rate 100 customers in 2012 and earlier.

b) Please explain in greater detail why incremental funding will not produce proportionally more gas savings across the rate class, and if this is the case please explain the value provided by the incremental funding.

c) Please provide the details for the determination that 30% was the appropriate proportion for the proposed downward adjustment, illustrated by supporting calculations.

Response:

a) Funding support for energy plans and energy monitoring has been available through the Engineering Feasibility Study & Process Improvement Study offerings.

b) The 2013 – 2014 Plan does not propose any incremental funding other than annual inflation. The anticipated reduction in gas savings is explained at Exhibit B2.9 b).

c) Please see the response at Exhibit B2.9 b).

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AIT1/p. 18, lines 8 and 9. The evidence proposes adjustment of natural gas savings targets prospectively based on performance in the prior calendar year.

Given the relatively small number of customers involved in DSM programs for the T1/proposed T2/Rate 100 classes, please comment on the appropriateness of using a 3 year rolling average for prospective adjustment of natural gas savings targets for these rate classes in lieu of the mechanism proposed.

Response:

Union has proposed adjustment of natural gas savings targets prospectively based on the performance in the prior calendar year to maintain consistency with the 2013 and 2014 Resource Acquisition scorecard target and to minimize adjustment factors required in the calculation. The use of a 3 year rolling average would introduce additional complexity into the prospective adjustment of natural gas savings targets. An adjustment would need to be considered to account for the budget transfer limitation between Large Volume Rate Classes for the years prior to 2012. In setting the 2014 Rate T2/Rate 100 Cumulative Natural Gas Savings target, the 30% discount rate would have to be applied to the 2011 and 2012 results. These adjustments are not required in Union's proposal.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AIT1/p.20, Table 5

a) Please confirm that this table indicates that, on a four year average basis, a typical Rate 100/large Rate T1 customer has received 40% or less of the DSM costs paid by the customer in rates back in funding for the customer's own DSM programs.

b) Please provide the data, broken down by customer (without naming the customers) that results in this average.

Response:

a) This table does not display the percentage of the total DSM costs paid by a typical Rate 100/large Rate T1 customer in rates that is received back in funding for the customer's DSM activity. The table provides Union's calculation, based on the data available, of what the results for the Rate T2 / Rate 100 Percentage of Customer Incentive Budget Spent metric would have been for 2008 – 2011. The process Union used to calculate these values is provided in Exhibit A, Tab 1, Page 20, line 3 – 16.

b) As Union capped the value at 100% for each customer Union has provided both the calculated percentage and capped data by customer. Union capped the value at 100% as the 2013 – 2014 metric cannot exceed full utilization of the direct access customer incentive available at an individual customer level for the purposes of measuring the Rate T2 / Rate 100 Percentage of Customer Incentive Budget Spent metric.

Percentage of Customer Incentive Budget Spent Baseline Calculation Data for Rate T2 Customers

	2008		2009		2010		2011	
Rate T2 Customer	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)
Customer A	144%	100%	20%	20%	30%	30%	67%	67%
Customer B	0%	0%	0%	0%	120%	100%	207%	100%
Customer C	16%	16%	114%	100%	0%	0%	0%	0%
Customer D	87%	87%	0%	0%	3%	3%	1%	1%
Customer E [1]			-- [2]	100%	0%	0%	0%	0%
Customer F	301%	100%	444%	100%	88%	88%	154%	100%
Customer G	0%	0%	0%	0%	5%	5%	0%	0%
Customer H	0%	0%	0%	0%	0%	0%	54%	54%
Customer I	20%	20%	37%	37%	7%	7%	10%	10%
Customer J	0%	0%	0%	0%	22%	22%	65%	65%
Customer K	0%	0%	0%	0%	6%	6%	0%	0%
Customer L	0%	0%	0%	0%	359%	100%	276%	100%
Customer M	12%	12%	0%	0%	0%	0%	0%	0%
Customer N	0%	0%	0%	0%	0%	0%	0%	0%
Customer O	0%	0%	941%	100%	0%	0%	666%	100%
Customer P [1]			0%	0%	322%	100%	57%	57%
Customer Q	1033%	100%	186%	100%	273%	100%	384%	100%
Customer R	0%	0%	0%	0%	0%	0%	0%	0%
Customer S	28%	28%	506%	100%	22%	22%	54%	54%
Customer T	1213%	100%	0%	0%	665%	100%	156%	100%
Average		**31%**		**33%**		**34%**		**45%**

[1] Not a Union Gas customer in 2008.
[2] The calculated percent is not comparable in 2009 for this customer as their commissioning date was late in the year. Union has assumed the cap of 100% for this customer.

Percentage of Customer Incentive Budget Spent Baseline Calculation Data for Rate 100 Customers

	2008		2009		2010		2011	
Rate 100 Customer	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)	Customer Incentive Received / Customer Incentive in Rates (Calculated %)	Customer Incentive Received / Customer Incentive in Rates (Capped at 100%)
Customer U	0%	0%	0%	0%	118%	100%	45%	45%
Customer V	0%	0%	23%	23%	41%	41%	4%	4%
Customer W	0%	0%	0%	0%	2%	2%	0%	0%
Customer X	0%	0%	5%	5%	15%	15%	26%	26%
Customer Y	0%	0%	0%	0%	10%	10%	6%	6%
Customer Z	0%	0%	0%	0%	5%	5%	127%	100%
Customer AA	0%	0%	0%	0%	21%	21%	0%	0%
Customer BB	13%	13%	320%	100%	201%	100%	38%	38%
Customer CC	0%	0%	0%	0%	0%	0%	0%	0%
Customer DD	26%	26%	573%	100%	650%	100%	685%	100%
Customer EE	0%	0%	0%	0%	0%	0%	217%	100%
Customer FF	-- [1]	100%	1697%	100%	44%	44%	133%	100%
Customer GG	68%	68%	200%	100%	476%	100%	310%	100%
Customer HH	0%	0%	958%	100%	695%	100%	891%	100%
Customer II	3293%	100%	485%	100%	274%	100%	925%	100%
Customer JJ	12%	12%	48%	48%	761%	100%	844%	100%
Customer KK	0%	0%	0%	0%	0%	0%	0%	0%
Average		**19%**		**40%**		**49%**		**54%**

[1] The calculated percent is not comparable in 2008 for this customer as their commissioning date was late in the year. Union has assumed the cap of 100% for this customer.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.AIT1/p.31 , lines 19 through 21

Please explain how DSM activities *"are ancillary to and support the provision of regulated distribution, transmission and storage services"*.

Response:

Union considers its DSM activities to be ancillary to and supportive of the provision of regulated services because they are not directly related to the distribution, transmission and storage of natural gas.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.Aff1/p.34, lines 13 and 14. The evidence posits that large volume customers opting out of DSM programming would obtain *"special rate treatment at the expense* of *other customers in the class"*.

Please identify the customer expenses that would be driven by customers opting out of DSM programming, and how these expenses would end up being paid by other customers in the class.

Response:

Allowing large volume customers the ability to opt-out of DSM programming would result in an intra-class subsidy, where customers who chose not to opt out of DSM programming would also bear the DSM costs of customers who chose to opt-out. Such an approach is inconsistent with the principles of class ratemaking, whereby the costs allocated to a rate class are recovered from all customers in the class. In effect, this approach would represent special, end-user specific rate treatment for customers who opt-out of DSM programming and in Union's view is not appropriate.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.Aff1/p.34 , lines 7 through 9

a) Please confirm that the DSM technical support provided to large volume customers is paid for, at a rate class level, by the customers benefiting from the support.

b) In light of the response to (a), please explain what the term "leverage" means as used in the referenced evidence.

c) Does such "leveraging" entail a cross-subsidy between customers within the class?

Response:

a) Confirmed. As technical support costs are not tracked at a rate class level, they will be assigned by rate class based on the percentage allocation of the customer incentive costs. This is consistent with the allocation of these costs in 2012 outlined in the EB-2011-0327 Settlement Agreement[1].

b) The term "leverage" in the referenced evidence means "access".

c) Accessing technical support does not in itself entail an intra-class subsidy between customers within a rate class.

Under the principles of class ratemaking, costs allocated to a rate class are recovered from all customers within the class. A customer that does not avail themselves of Union's DSM technical support will contribute to the recovery of these costs in rates and effectively subsidize the other customers in the rate class that are utilizing DSM technical support.

[1] Union Gas Limited Settlement Agreement. January 31, 2012. (EB-2011-0327). P.36.

UNION GAS LIMITED

Answer to Interrogatory from
Industrial Gas Users Association ("IGUA")

Reference: Ex.Aff1/Appendix C. The evidence indicates requests by large volume customers consulted for change to the means by which DSM variances are recovered.

Please confirm that this request is appropriately addressed in Union's current variance and deferral account disposal application [EB-2012-0087].

Response:

Confirmed.