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Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto, ON M4P 1E4

Your reference
EB-2012-0337

Our reference
01015413-0031

Direct line
+1 (416) 216-1927

Email
john.beauchamp@nortonrose.com

Dear Ms. Walli:

EB-2012-0337 – Union Gas Limited – 2013-2014 Large Volume DSM Plan Application APPrO Cross Examination Compendium

Attached is a copy of APPrO's cross examination compendium for the above proceeding

Yours very truly,

Original signed by

John Beauchamp

JB/mnm

cc: All Interested parties

DOCSTOR: 2619919\1

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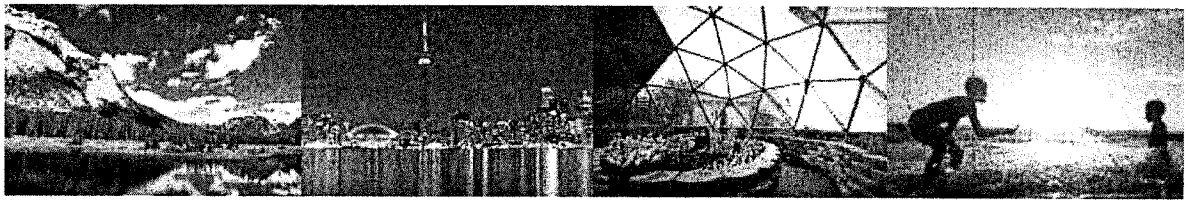
EB-2012-0337 - APPrO Cross Examination Compendium

INDEX

TAB 1

Marbek



Natural Gas Energy Efficiency Potential
Residential, Commercial and Industrial Sectors

Summary Report – Update 2011

Project
114103

Submitted to
Union Gas Distribution

Submitted by
ICF Marbek

July 2011

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5 Industrial Sector

The Industrial sector consists of the eight largest natural gas consuming industrial sub sectors within the Union service area plus an additional miscellaneous category that combines the remaining smaller industry groups. As applicable, each of the eight large industrial sub sectors was further divided into the very large "Contract" customers and the remaining "Other" sites. The large Contract customers, which are the primary focus of this study, are: Primary Metal, Chemical, Paper, Transportation and Machinery, Petroleum Refineries, Mining, Food and Beverage and Non-metallic Mineral.

5.1 Approach

The detailed end-use analysis of energy efficiency opportunities in the Industrial sector employed ICF Marbek's customized macro model. The model is organized by major industrial sub sector and major end use.

Natural gas end-use profiles were developed for the nine sub sectors described above. The profiles map proportionally how much natural gas is used by each of the end uses for each sub sector. These profiles represent the sub sector archetypes and are used in the model to calculate the natural gas used by each end use for each sub sector.

The major steps in the general approach to the study are outlined in Section 1.4 above (Approach). Specific procedures for the Industrial sector were as follows:

- **Modelling of Base Year:** The consultants compiled Base Year data on the industrial sector from a variety of sources, including Union's customer information, the study team's own energy assessment experience within many of the sub sectors and secondary data sources. The macro model results produced a close match with actual Union sales data.

- **Reference Case Calculations:** The consultants prepared a Reference Case forecast based on projected growth forecasts provided by Union, which includes anticipated closing of existing facilities and opening of new facilities.

- **Assessment of DSM Measures:** To estimate the economic and achievable natural gas savings potentials, the consultants assessed a wide range of commercially available energy efficiency measures and technologies such as:

  - Integrated control systems
  - More efficient boiler, steam and hot water systems
  - Efficient process heating technologies
  - Efficient space heating and ventilation, including solar thermal technologies.

5.3 Base Year Natural Gas Use

In the Base Year of 2007, the Industrial sector in Union's total service area consumed about 5,465 million m^3 of natural gas. This volume excludes natural gas used for power generation, co-generation and industrial feedstock, as these uses of natural gas are beyond the scope of this study.

The twelve core industrial sub sectors (both contract and other customers), shown in Exhibit 25, account for 88% of the total industrial natural gas consumption. About 70% of the total industrial natural gas consumption occurs in the Southern service region.

Exhibit 25: Base Year Industrial Sector Natural Gas Consumption for the Total Union Service Area (1,000 m^3/yr.)

Sub Sector	End Use					Total	
	Hot Water Systems	Boiler Steam Systems	Process Direct Heat	Other Process	HVAC		
Contract Primary Metal	27,568	161,964	963,099	31,428	194,357	1,378,415	25%
Contract Chemical	20,117	408,369	331,925	74,222	171,201	1,005,834	18%
Other Chemical	741	15,034	12,220	2,732	6,303	37,030	0.7%
Contract Paper	11,344	353,887	107,431	10,380	84,175	567,218	10%
Contract Transportation and Machinery	7,827	91,046	117,313	15,868	159,278	391,332	7%
Other Transportation and Machinery	2,984	34,718	44,734	6,051	60,736	149,223	3%
Contract Petroleum Refineries	7,520	72,251	253,607	6,738	35,873	375,989	7%
Contract Mining	64,023	80,029	112,041	16,006	48,017	320,117	6%
Other Mining	4.9	6.1	8.6	1.2	3.7	25	0.0004%
Contract Food and Beverage	20,142	120,397	69,212	15,585	26,436	251,771	5%
Other Food and Beverage	4,463	26,680	15,337	3,454	5,858	55,793	1%
Contract Non-Metallic Mineral	5,598	33,477	198,345	10,581	31,910	279,911	5%
Miscellaneous Industrial	33,945	75,984	127,031	17,690	398,131	652,781	12%
Total	206,277	1,473,842	2,352,303	210,736	1,222,280	5,465,438	
%	4%	27%	43%	4%	22%		

As illustrated in Exhibit 26, process direct heat accounts for about 43% of total industrial sector natural gas use in the base year. Boiler steam systems account for about 27% of the total natural gas use, followed by heating, ventilation and air conditioning (HVAC), which accounts for about 22%. Other processes and hot water systems account for the remaining natural gas consumption.

TAB 2

CME Ontario

Advancing Opportunities in Energy Management in Ontario Industrial and Manufacturing Sector

Final Report

Submitted by:
Canadian Manufacturers & Exporters

In Association with:
Stantec Consulting, Marbek, and ODYNA

March 17, 2010

Revision 1

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Marbek ODYNA

1 Introduction

1.1 Background and Objectives

Energy management (EM) is increasingly being recognized as an important core strategy to help sustain the productive sectors of our economy and reduce industry's negative impact on climate change through the following benefits:

- Reduced operating costs,
- Increased productivity,
- Retention of manufacturing jobs and value added,
- Reduced air emissions, and
- Deferred or avoided new energy infrastructure.

Canadian Manufacturers & Exporters (CME) is a long time and strong proponent of EM and retained Stantec Consulting and Marbek to conduct a study:

Advancing Opportunities in Energy Management in Ontario Industrial and Manufacturing Sector

The outcomes of this study fill critical knowledge gaps pertaining to EM potential in Ontario industry and provide the basis for public policy and program initiatives targeted to help Ontario industry increase its competitiveness and reduce greenhouse gas (GHG) and criteria air contaminant (CAC) emissions associated with energy use.

The primary objectives of the study are to:

- Determine the ***current EM performance*** of the industrial sector as represented by the benchmarks of MBP and TBP implementation.
- Estimate the ***economic potential*** for EM, together with the associated greenhouse gas (GHG) and criteria air contaminants (CACs) emission reduction in the industrial sector.
- Benchmark the ***GHG and CAC emissions*** associated with energy use in Ontario's industrial sector.
- Develop a ***framework*** to accelerate the implementation of best practices and increase industry's EM performance.

1.2 Study Scope

This study focuses on the Ontario industrial and manufacturing sectors defined as follows:

- ***Industrial and Manufacturing Sector:*** Relates to all Industrial and Manufacturing operations, as defined at the 2 digit North America Industry Classification System (NAICS) code level and included under:
  - NAICS 21: Mining and Quarrying (excluding Oil and Gas Extraction)
  - NAICS 31 – 33: Manufacturing
- ***Sub-Sector:*** Relate to activities at the 3 digit NAICS Code level. The sub-sectors are defined in Exhibit 1.

Exhibit 1: Industrial Sub-sectors and Associated NAICS Codes and Descriptions

NAICS	Sub-sectors
331	Primary Metal Manufacturing
325	Chemical Manufacturing
322	Paper Manufacturing
327	Non-Metallic Mineral Product Manufacturing
3241	Petroleum and Coal Products Manufacturing
336, 333	Transportation Equipment and Machinery Manufacturing
311, 312	Food, Beverage, and Tobacco Product Manufacturing
212	Mining (Excl. Oil & Gas)
332	Fabricated Metal Product Manufacturing
326	Plastics and Rubber Products Manufacturing
	Other Manufacturing

As further elaborated, the study was executed at the industry sub-sector level to ensure a defensible, robust analysis. However, to maintain confidentiality requirements for the study's participating companies, the results are presented at an aggregate industry-wide level with further elaboration according to key energy end-uses.

1.3 Report Presentation

The remainder of the report is structured to present:

- The methodology, definitions and survey sample in Sections 2, 3, and 4.
- The 2007 Base Year and Reference Case energy use profiles in Sections 5 and 6.
- The energy efficiency and conservation best practices, and the Base Year implementation of the best practices in Sections 7 and 8.
- The Economic Potential scenario in Section 9.
- The challenges, barriers and program concepts to increase the implementation of best practices, in Section 10.
- The GHG and CAC emissions associated with the energy use and energy savings potential in section 11.
- An Action Plan to advance energy efficiency in Ontario industry in Section 12.

TAB 3

Catalogue no. 12-501-X

North American Industry Classification System (NAICS) Canada

2012

Statistics Canada Statistique Canada

Canada

Classification structure

The structure of NAICS Canada displays the codes and titles of the sectors, subsectors, industry groups, industry, and Canadian industries. In general, comparable sectors, subsectors, industry groups, industries carry the same code in NAICS Canada, NAICS Mexico and NAICS United States.

The superscripts at the end of NAICS class titles are used to signify comparability:

CAN	Canadian class only
MEX	Canadian and Mexican classes are comparable
US	Canadian and United States classes are comparable
[Blank]	Canadian, Mexican and United States classes are comparable.

212232 Nickel-copper ore mining CAN
212233 Copper-zinc ore mining CAN
21229 Other metal ore mining
212291 Uranium ore mining US
212299 All other metal ore mining US

2123 Non-metallic mineral mining and quarrying
21231 Stone mining and quarrying
212314 Granite mining and quarrying CAN
212315 Limestone mining and quarrying CAN
212316 Marble mining and quarrying CAN
212317 Sandstone mining and quarrying CAN
21232 Sand, gravel, clay, and ceramic and refractory minerals mining and quarrying
212323 Sand and gravel mining and quarrying CAN
212326 Shale, clay and refractory mineral mining and quarrying CAN
21239 Other non-metallic mineral mining and quarrying
212392 Diamond mining CAN
212393 Salt mining CAN
212394 Asbestos mining CAN
212395 Gypsum mining CAN
212396 Potash mining CAN
212397 Peat extraction CAN
212398 All other non-metallic mineral mining and quarrying CAN

213 Support activities for mining, and oil and gas extraction

2131 Support activities for mining, and oil and gas extraction
21311 Support activities for mining, and oil and gas extraction
213111 Oil and gas contract drilling
213117 Contract drilling (except oil and gas) CAN
213118 Services to oil and gas extraction CAN
213119 Other support activities for mining CAN

22 Utilities

221 Utilities

2211 Electric power generation, transmission and distribution
22111 Electric power generation US
221111 Hydro-electric power generation US
221112 Fossil-fuel electric power generation US
221113 Nuclear electric power generation US
221119 Other electric power generation US
22112 Electric power transmission, control and distribution US
221121 Electric bulk power transmission and control US
221122 Electric power distribution US

2212 Natural gas distribution
22121 Natural gas distribution US
221210 Natural gas distribution US

2213 Water, sewage and other systems
22131 Water supply and irrigation systems US

TAB 4

POLICIES and GUIDELINES

Policy #: 09-DP-STOR-018

Subject:	**Effective:**
Cost-Based Storage Space and Deliverability Allocation Methodology – Northern and Eastern Operations Area	**June 21, 2000**

Applies to:

Bundled, Bundled (T-Service) and Unbundled Customers in the Northern and Eastern Operations Area

Purpose:

To describe the amount of cost-based storage space and deliverability an in-franchise firm service customer in the Northern and Eastern Operations Area may receive from Union Gas.

Background: *(Not to limit the applicability of the policy)*

Allocation of Storage Space

Storage space at Dawn is allocated to the Northern and Eastern operations area using a two-step approach. The first step is to allocate storage space to the whole of the Northern and Eastern operations area using the Ontario Energy Board (the "Board") approved aggregate excess method as described in the Cost-Based Storage Space and Deliverability Allocation Methodology - Southern Operations Area policy (Policy #09-DP-STOR-017).

The next step is to allocate storage space to each of the Delivery Areas and the individual customers within the Delivery Area using the Board approved (RP-1999-0017) Peak Day Shortfall methodology. The peak day shortfall is the difference between peak day demand and allocated firm transportation capacity. Under the peak day shortfall method, storage space is allocated to each delivery area in proportion to the peak day shortfall for all bundled customers in the delivery area. Similarly, the storage space allocated to the delivery area is then allocated to each rate class in proportion to its peak day shortfall.

When an individual customer in a Northern and Eastern delivery areas elects a bundled (T-Service) or unbundled storage service, they are allocated storage space in proportion to their peak day shortfall.

- The amounts allocated to firm service contract rate customers upon renewal of the contract will not be recalculated each year. Once the customer has elected storage, the storage space quantity will not change unless the customer requests to have it reduced. If a contract rate customer or their agent elects less than 100% of the cost-based storage space allocation at any time, this will represent a permanent election – the customer will no longer be able to access the declined space at cost-based rates in the future.
- Amounts allocated to unbundled general service customers (Rate 01 and Rate 10) are redetermined at April 1 of each year.
- No cost based storage is available to interruptible customers (Rate 25)

Unbundled customers must also contract for storage delivery and redelivery services (subject to availability) to deliver gas to storage and redeliver gas from storage to their delivery area as outlined below.

Allocation of Delivery Capacity

Delivery capacity uses TransCanada Pipelines ("TCPL") Storage and Transportation Services ("STS") injections, pooling rights and Parkway-Dawn capacity to transport excess FT capacity from the delivery area to Dawn. Recognizing that the need for delivery capacity is even through the summer, delivery capacity is allocated to the appropriate delivery areas, rate classes, and customers based on allocated Firm transportation capacity in excess of average summer demands.

Allocation of Redelivery Capacity

Redelivery capacity uses TCPL STS withdrawals, pooling rights and Dawn-Parkway capacity to transport gas between Dawn and the Northern and Eastern delivery areas. Union retains some redelivery capacity to address demand swings due to temperature variances from forecast. Recognizing that the need for redelivery capacity tends to increase significantly during periods of extreme cold (i.e. peak day), the remaining redelivery capacity is allocated to the appropriate delivery areas, rate classes, and customers based on peak day shortfall

Policy:

Annual Firm Storage Space
The allocation of storage space to customers electing these service options reflects the Board approved Peak Day Shortfall methodology applied as follows:

Rate S1 Unbundled Storage Service available to General Service customers	▪ Union will allocate a fixed amount of storage space per Rate 01 residential customer. ▪ Union will allocate commercial and industrial customers their proportionate amount of storage allocated to the appropriate rate class in the delivery area based on the peak day shortfall. ▪ Storage space allocation will be recalculated annually.
Bundled (T-Service) and Unbundled Storage Service available to contract rate classes Rate 20 (Medium Volume Firm Service) and Rate 100 (Large Volume High Load Factor)	▪ Union will allocate Rate 20 and Rate 100 customer-specific allocation by delivery area in proportion to the peak day shortfall. ▪ Should a customer or an Agent acting on behalf of an end-use customer elect less that 100% of their cost based storage space allocation entitlement this will represent a permanent election and the customer or their Agent will no longer be able to access this capacity at cost based rates in the future.
Delivery to Storage (Injections)	▪ Union will allocate delivery capacity to unbundled customers in proportion to the difference between the amount of firm capacity allocated and the average summer daily demand in the appropriate delivery area.
Redelivery from Storage (Withdrawals)	▪ Union will allocate redelivery capacity to unbundled customers in proportion to the difference between the peak day demand and the allocated firm transportation capacity (i.e. Peak Day Shortfall) in the appropriate delivery area.

Procedures:

1) Union Gas will calculate or recalculate potential storage parameters for all new contracts and renewing S1 contracts.

2) Requests for new or revised Bundled T-Service or Unbundled Storage Service available to Rate 20 and Rate 100 contracts effective November 1 are evaluated during the month of March. For S1 contracts, the calculations will be based on information available approximately 45 days prior to contract renewal to reflect end-use locations added or deleted to the contract pursuant to the Gas Distribution Access Rule Electronic Business Transactions Standard. In addition:
   a. Union Gas will prepare storage allocations consistent with the above policy.
   b. Rate 20 and Rate 100 customers may propose and Union Gas may accept an alternative forecast (with a resulting change in contract parameters) provided the contract holder provides justification acceptable to Union Gas for the alternate forecast - a forecast of expected consumption to support the requested contract parameters to be effective November 1 must be provided during the month of March.
   c. Requests received after the above noted dates will be dealt with on a reasonable efforts basis.

3) Union Gas will issue a contract renewal reflecting storage parameter changes consistent with the above policy (along with all other contract parameter changes) approximately 35 days before the effective date of the renewal for customer signature.

4) Customer will sign and return the contract renewal to Union Gas at least 25 days before the effective date of the amendment.

5) Union Gas will sign the contract renewal and provide a copy to the customer approximately 1 week after receiving the signed amendment from customer.

TAB 5

POLICIES & GUIDELINES

Policy #: 09-DP-STOR-017

Subject:	**Effective:**
Cost-Based Storage Space and Deliverability Allocation Methodology – Southern Operations Area	**July 1, 2011**

Applies to:

Semi-Unbundled and Unbundled Customers in the Southern Operations Area.

Purpose:

To define the amount of cost based storage space and storage deliverability (injections and withdrawals) a T1, T3, U5, U7, or U9 customer may receive from Union Gas ("Union").

Background: *(Not to limit the applicability of the policy)*

In its Storage Allocation decision released April 2008 (EB-2007-0725) the Ontario Energy Board (the "Board") states:

- On page 44 of the decision, storage allocations are designed to accommodate a customer's "reasonable needs" which are governed by:
  - The requirement to balance flat daily obligated deliveries with varying customer consumption and
  - An equivalency between storage services that underpin bundled and semi-unbundled service
- On page 16 of the decision, the Board concludes that an expectation that T1 and T3 customers will actively manage their storage positions is an appropriate component of the determination of "reasonable needs."

Storage Space

Traditionally, storage space allocations to Union's customers have been determined using the aggregate excess method. This method is consistent with the approach used by Union to calculate the seasonal storage requirements of Union's bundled customer base. This requirement can be described as the difference between total winter consumption (November 1 through March 31) and a customer's average daily consumption over the year multiplied by 151 days of winter. The formula can be expressed:

Aggregate Excess = Total Winter Consumption – [(151/365)*(Total Annual Consumption)]

T1/T3 customers traditionally do not have their space and deliverability recalculated unless requested or they change their firm CD by an amount equal to or greater than 5%.

The storage space allocation for unbundled general service (U2) customers is determined using a fixed quantity per residential customer or a percentage of annual consumption for commercial and industrial customers. These quantities and percentages are determined each year based on Union's annual demand forecast and are consistent with the above-noted Aggregate Excess methodology.

In the above noted decision, the Board approved the use of the Aggregate Excess methodology (modified to remove the 2.4% reduction factor). The Board also approved an alternate methodology (i.e. 15 x obligated DCQ). This new methodology is more appropriate for meeting the needs of customers with non-seasonal, process-driven loads.

Customers are free to choose between the two methodologies.

Effective November 2011, storage will be reallocated annually at contract renewal.

Further, customers are able to contract for less than the amounts determined under the methodologies. Additional storage space, in excess of the allocated entitlements above, may be available at market prices.

Storage Deliverability

In the above noted Storage Allocation decision, the Board concluded that the maximum level of deliverability (i.e. injections & withdrawals) available to T1 & T3 customers at cost-based rates should equal the greater of obligated DCQ or firm CD - obligated DCQ. This cost based entitlement can be contracted using any combination of firm injections and withdrawals, interruptible withdrawals or incremental firm injections. For information related to interruptible services and their priority see the following link. (Policy #07-CM-POS-015)

Customers are able to contract for less than the amounts determined above. Additional deliverability, in excess of the allocated entitlements above, may be available at market prices.

Transition

The approved allocation methods will apply to all T1 and T3 customers. For new T1 and T3 customers, the methodologies will apply immediately. For customers that were receiving service under T1 and T3 at the time of the storage allocation decision, there will be a transition period. Existing customers can retain, at their option, the amounts of cost-based space and deliverability currently under contract subject to the current trigger of 5% change in Firm CD as noted. However, parameters for contracts renewed on or after November 1, 2011 shall be calculated using the newly approved allocation methodologies. If a customer chooses to change either their space allocation or their deliverability amount the new storage allocation rules apply. The current policy that states a change to a customer's firm CD by at least 5% will trigger a reevaluation of their storage space allocation will also be in effect during the transition period.

If there are circumstances that warrant a non-standard allocation methodology, customers can apply to the Board for a different methodology. It is important that the Board understand the circumstances and be satisfied that any such exceptions are justified because these methodologies rely on forecasted customer consumption. In cases where Union and the customer cannot agree upon a forecast, the customer has the right to seek the Board assistance.

As defined in the General Terms and Conditions that form part of Union's in-franchise Distribution and Direct Purchase contracts:

"Contract Demand" ("CD") means the maximum volume or quantity of Gas that Union is obliged to deliver in any one day to a Customer under all Services or, if the context so requires, a particular Service at the Consumption Point.

"**Daily Contract Quantity"** ("DCQ") means that portion of the daily parameters as set out in Schedule 1, being a quantity of Gas which Customer must deliver to Union on a Firm basis. The DCQ (GJ/day) is equal to 12 months of consumption at end-use locations underlying the direct purchase contract / 365 days * heat value (GJ/m³). If this Contract has a term greater than 12 months, the DCQ is calculated by dividing the historical consumption for the term of this Contract by the number of Days in this Contract term. The consumption of general service end-use locations is weather normalized.

Policy:

Annual Firm Storage Space

U2 (Unbundled) Service – available to General Service Rates M1 and M2 customers only	The allocation of storage space (Standard Storage Service ("SSS")) to customers electing the U2 unbundled service option reflects the Board approved Aggregate Excess methodology applied as follows: • From the total bundled aggregate excess storage space allocated to General Service rate classes, Union will allocate a fixed amount of storage space per M1 residential customer. • The amount of storage space an M1 or M2 commercial/industrial customer receives will be determined as a fixed percentage of their annual consumption. • For Standard Peaking Service ("SPS") Union will allocate high deliverability storage (SPS) based on a fixed percent of the customer's allocated SSS space.

	• SSS space allocation and SPS space allocation will be reallocated annually. • Should a customer or an Agent acting on behalf of an end-use customer elect less that 100% of their cost based storage space allocation entitlement this will represent a permanent election and the customer or their Agent will no longer be able to access this capacity at cost based rates in the future. • If all accounts on a U2 contract return to Union Gas's sales service the storage previously allocated will be returned to Union.
T1/T3 (Semi-Unbundled) and U5/U7/U9 (Unbundled) Service – Obligated Supply (DCQ or Parkway call)	Customers receiving these services have the option of electing the storage space allocation method which best serves their needs. The allocation methods available are: <u>Aggregate Excess Methodology</u> Aggregate Excess = Total Winter Consumption – [(151/365)*(Total Annual Consumption)] Existing customers: • Using the most recent twenty-four months historical consumption data to calculate two 12 month historical aggregate excess allocation amounts of storage space, with 25% weighting for each year, plus • Using one year of forecasted consumption to calculate a forecasted aggregate excess allocation amount for storage space with a 50% weighting. New customers or customers who do not have sufficient historical consumption data or customers forecasting a significant change in operation: • Union will work with the customer to determine a reasonable forecast for use in calculating the storage allocation. In following years, once historical consumption information is available, the approach described above will be followed. <u>15X DCQ Methodology</u> • The 15 x obligated DCQ calculation will apply the DCQ calculated for the upcoming contract year. Under either methodology, the calculations will be performed and incorporated into the contract at each contract renewal date. Customers may contract for less storage space than the amounts determined above.
New large T1 (Semi-Unbundled) and U7 (Unbundled) Service – daily firm transportation demand requirements in excess of 1,200,000 m3/day	Customers receiving these services have the storage space allocation calculated as follows: • Peak hourly consumption x 24 hours x 4 days, unless customer elects firm deliverability less than maximum entitlement. • If customer elects less than the maximum deliverability entitlement, the maximum cost based storage space entitlement is 10 x firm storage deliverability contracted (but not to exceed peak hourly consumption x 24 hours x 4 days). • Customers may contract for less than their maximum entitlement of firm storage space.

Annual Firm Storage Deliverability

U2, U5, U7, U9 (Unbundled) Service	• SSS daily injection entitlement is calculated as 0.75% of the contracted storage space allocation and SSS withdrawal entitlement is calculated as 1.2% of the contracted storage space allocation. • For U2 contracts only, SPS daily injection and withdrawal entitlements are calculated as 10% of the SPS storage balance subject conditions outlined in contract. • Quantities available on a daily basis change based on the customer's storage inventory levels changes (for SSS and SPS) and weather (for SPS).
T1/T3 (Semi-Unbundled) Service	• The maximum deliverability available to a customer is the greater of: ▪ Obligated DCQ; or ▪ Firm CD less Obligated DCQ. • A customer may contract up to the maximum deliverability entitlement using a combination of firm injections and withdrawals, interruptible withdrawals or incremental firm injections as specified in Section (C) Storage Service on the rate schedule. • Customers may contract for less than their maximum entitlement of firm deliverability. • There is no assurance by Union that storage deliverability will be available on peak days if a customer does not contract for firm storage deliverability and chooses instead to rely on interruptible storage deliverability. (Policy #07-CM-POS-015)
New large T1 (Semi-Unbundled) and U7 (Unbundled) Service - daily firm transportation demand requirements in excess of 1,200,000 m3/day	• The maximum entitlement of firm storage deliverability is 24 x the customer's peak hourly consumption.

Procedures

1) For T1, T3, U5, U7 and U9 contracts, the calculations for storage parameters will be based on information available approximately 80 days prior to contract renewal. For U2 contracts, the calculations for storage parameters will be based on information available approximately 45 days prior to contract renewal to reflect end-use locations added or deleted to the contract pursuant to the Gas Distribution Access Rule Electronic Business Transactions Standard. In addition:
    a. Union Gas will prepare and provide storage allocations summarizing forecast consumption, Contract Demand (where applicable) and obligated DCQ (per Policy #05-DP-DCQS-009) consistent with the above policy approximately 70 days prior to the contract's renewal date. T1 and T3 customers will be allocated quantities under the applicable methodologies.
    b. Customer may propose and Union Gas may accept an alternative forecast (with a resulting change in contract parameters) provided the contract holder provides justification acceptable to Union Gas for the alternate forecast - a forecast of expected consumption to support the requested contract parameters must be provided no later than 54 days before the contract's renewal date. Requests received after this date will be dealt with on a reasonable efforts basis.
    c. T1 and T3 customers will inform Union Gas of the methodology they have selected for the determination of storage parameters approximately 54 days prior to the contract's renewal date.

2) Union Gas will issue a contract renewal reflecting storage parameter changes consistent with the above policy (along with all other contract parameter changes) approximately 35 days before the effective date of the renewal for customer signature.

3) Customer will sign and return the contract renewal to Union Gas at least 25 days before the effective date of the amendment.

4) Union Gas will sign the contract renewal and provide a copy to the customer approximately 1 week after receiving the signed amendment from customer.

TAB 6

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

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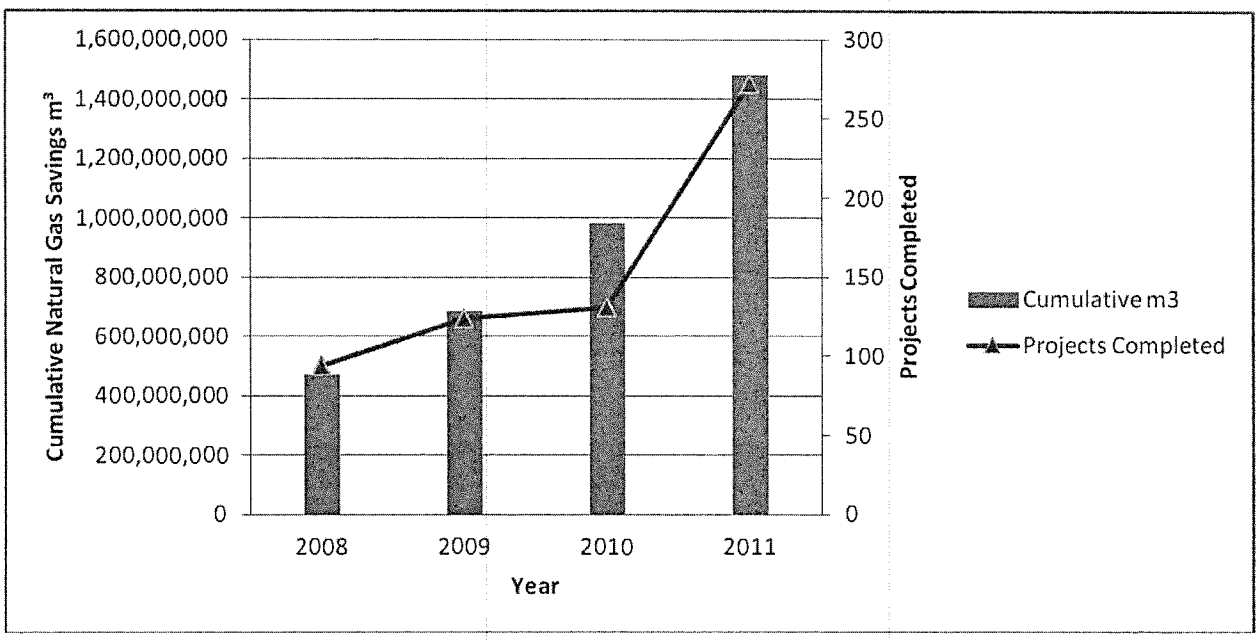
[1] ICF Marbek. *Natural Gas Energy Efficiency Potential, Summary Report – Update 2011. July 2011 (EB-2011-0327,Exhibit A, Appendix K)* and Canadian Manufacturers & Exporters in Associate with Stantec Consulting, Marbek, and ODYNA. *Advancing Opportunities in Energy Management in Ontario and Manufacturing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

TAB 7

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.

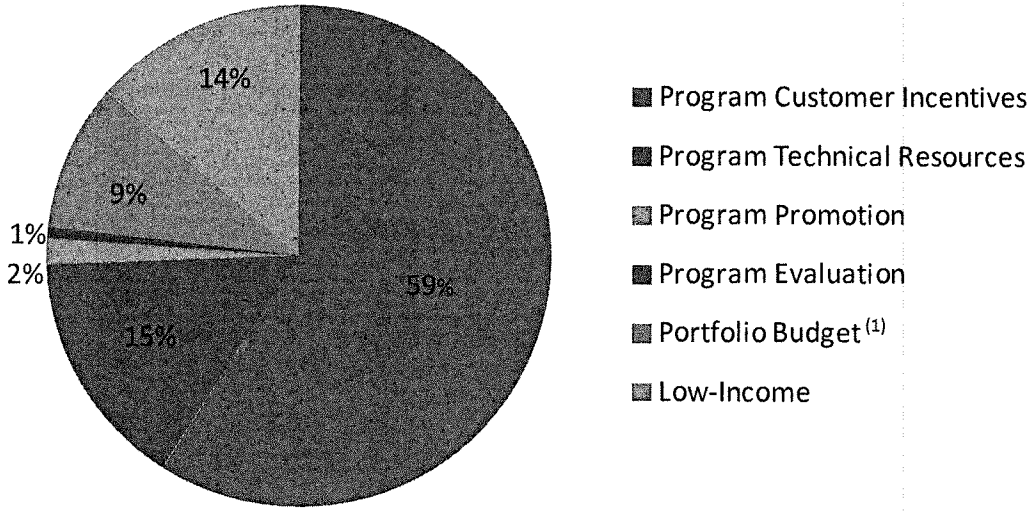
- 15.36% of the total DSM budget ($6.207 million) = $0.953 million
- $0.907 million adjusted for 2012 and 2013 inflation (2.87% and 2.22% respectively) = $0.953 million

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.

TAB 8

Figure 1 - Percentage Allocation of Rate T2, Rate T1, Rate 100 DSM Budget Items



(1) Includes portfolio level research, evaluation and administration allocated to Union's Large Volume Rate Classes

As displayed, 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.

The process and timing for Rate T1, Rate T2 and Rate 100 customers to access available customer incentive funding will follow two distinct mechanisms, as outlined below:

Rate T1

- Rate T1 customers will have access to an Aggregated Pool of customer incentive budget.
- This budget will be available to all Rate T1 customers throughout each program year.
- This is consistent with Union's customer incentive budget approach in 2012 for these customers.

Rate T2/Rate 100

- From January 1 until April 1 of each year, Union's energy-efficiency experts will assist customers to develop an energy-efficiency plan. This plan will identify potential projects, their timing and associated customer incentive funding. The energy-efficiency plan is to be submitted to Union by April 1.
- From January 1 until August 1 of the program year, each Rate T2 and Rate 100 customer will have dedicated access to the amount of the customer incentive budget they fund in their rates for energy-efficiency initiatives.
- After August 1 of each year, any remaining funds that have not been allocated to projects or studies will become available to any customer within their rate class.

2. PROGRAM BUDGET

Consistent with the Guidelines and the Agreement as it relates to other DSM programs, Union is proposing to escalate the current approved Large Volume DSM Program budget of $4.664 million by inflation each year to arrive at the 2013 and 2014 Large Volume Rate T1/Rate T2/Rate 100 Program budgets. The inflation rate for 2013 and 2014, also consistent with the Agreement, will be calculated using the four quarter rolling average of the Gross Domestic Product Implicit Index ("GDP-IPI"), released at the end of August of the prior calendar year. Accordingly, the 2013 budget will be the 2012 budget escalated using the inflation rate of 2.22% calculated using the four quarter rolling average of the GDP-IPI as at Q2, 2012. For illustrative purposes, the 2014 budget in Table 2 has been escalated using the 2013 inflation factor.

Table 2 provides the 2012 Board approved program budget, and proposed annual Large Volume Rate T1/Rate T2/Rate 100 program budget for each year of the Plan.

Table 2: 2012 – 2014 Large Volume Rate T1 / Rate T2 / Rate 100 Program Budget

	Year		
	2012 [2] ($000)	2013 ($000)	2014 ($000)
Large Volume T1/T2/R100 Program Budget			
Program Customer Incentives	$ 3,487	$ 3,487	$ 3,487
Program Promotion	$ 100	$ 100	$ 100
Program Technical Resources	$ 907	$ 907	$ 907
Program Evaluation	$ 40	$ 40	$ 40
Cumulative Inflation [1]	$ 130	$ 234	$ 339
Total Large Volume DSM Program Budget	**$ 4,664**	**$ 4,767**	**$ 4,873**

[1] Inflation rate for 2012 is 2.87% and for 2013 is 2.22%. For 2014 the illustrative inflation rate is 2.22%.

[2] Approved as per EB 2011-0327

The total DSM amount to be included in rates for 2013 and 2014 for Union's Large Volume rate classes is displayed in Table 3 below. In addition to the Program budget, this includes the portion of the total DSM portfolio budget and Low-income costs allocated to Rate T1, Rate T2 and Rate 100. The total portfolio budget, Low-income budget, and methodology to allocate these budgets to Union's rate classes were filed in the 2012 – 2014 DSM Settlement Agreement and approved by the Board (EB-2011-0327).

Table 3: Total DSM Amount Allocated to Large Volume Rate T1/Rate T2/ Rate 100 Classes

		Year		
		2012 ($000)	2013 ($000)	2014 ($000)
Portfolio Budget (For All Union Programming)				
Research		$ 766	$ 766	$ 766
Evaluation		$ 969	$ 969	$ 969
Administration		$ 1,582	$ 1,582	$ 1,582
Total DSM Portfolio Budget Pre-Inflation		$ 3,317	$ 3,317	$ 3,317
Cumulative Inflation [1]		$ 95	$ 171	$ 248
Total DSM Portfolio Budget Post-Inflation	(a)	$ 3,412	$ 3,488	$ 3,565
Portfolio Budget Allocation to Rate T1/Rate T2/Rate 100 (%)[2]	(b)	16.9%	16.9%	16.9%
Portfolio Budget Amount Allocated Rate T1/ Rate T2/ Rate 100 ($000) [1]	(c) = (a) * (b)	$ 578	$ 591	$ 604
Large Volume Rate T1/Rate T2/Rate 100 Program Budget [1]	(d)	$ 4,664	$ 4,767	$ 4,873
Total Large Volume Program and Allocated Portfolio Budget [1]	(e) = (c) + (d)	$ 5,241	$ 5,358	$ 5,477
Low-Income Allocation to Rate T1/Rate T2/Rate 100 [1]	(f)	$ 831	$ 850	$ 869
Total DSM Budget Allocation to Rate T1/Rate T2/Rate 100 [1]	(g) = (e) + (f)	$ 6,073	$ 6,207	$ 6,345

[1] Inflation rate for 2012 is 2.87% and for 2013 is 2.22%. For 2014 the illustrative inflation rate is 2.22%.

[2] Calculated as the pre-inflation Large Volume Rate T1/Rate T2/Rate 100 program budget $4.534 M / Total pre-inflation DSM budget for all programs of $26.773.

The sum of the proposed Large Volume Rate T1/Rate T2/Rate 100 Program and allocated Board-approved portfolio budget for these rate classes is $5.358 million in 2013 and $5.477 million in 2014. As with the 2012 Program budget, Union must allocate the 2013 and 2014 Program budget and allocated portfolio budget between the large volume rate classes. Of the total Large Volume Program budget, Union proposes to allocate 32% to Rate T1, 38% to Rate T2 and 30% to Rate 100. This allocation of DSM costs is consistent with Union's 2013 Cost of Service Application (EB-2011-0210, Exhibit J.H-8-13-2) (adjusted for 2013 inflation factor of 2.22% versus 2.87%). The amount in each Large Volume rate class is provided at Exhibit A, Tab 1, Schedule 1.

The 2013 Low-income budget is based on the 2012 Low-income budget, which was allocated using the 2012 Board-approved distribution revenue by rate class in Union's EB-2011-0025 rates proceeding. The 2013 Low-income budget also includes an inflation factor adjustment of 2.22%. Further, for the 2013 proposed Rate T1 and Rate T2 split, the Low-income budget is allocated based on the 2013 forecast revenue (per EB-2011-0210) for these rate classes. The allocation of

a target formula based on the actual 2013 post-audit metric result for the 2014 targets. Therefore, the 2014 targets will be adjusted based on the performance of the prior calendar year to drive continual improvement.

4. DSM INCENTIVE

Table 6 below shows the 2013 – 2014 maximum shareholder financial incentive allocated to the Large Volume Rate T1/Rate T2/Rate 100 scorecard based on the Program budget share. The Program budget and percentage budget share aligns with the values presented in Table 3.

The DSM Incentive is consistent with the Guidelines. It is allocated based on the program budget share and escalated for inflation annually. For 2013, all values in Table 6 have been escalated using the 2013 inflation factor of 2.22%. For illustrative purposes, the 2014 values have been escalated using the 2013 inflation factor. Actual 2014 inflation will be based on the four quarter rolling average GDP-IPI issued by Statistics Canada in the second quarter of 2013 and published at the end of August.

Table 6: Maximum DSM Incentive Allocated to Large Volume Program Scorecard

	2013			2014		
	Budget	Budget Share	Max Utility Incentive	Budget	Budget Share	Max Utility Incentive
	($000)	%	($000)	($000)	%	($000)
Scorecard						
Large Volume Rate T1 / Rate T2 / Rate 100	4,767	16.9%	1,809	4,873	16.9%	1,849
Programs Sub-total [1]	**28,153**	**100.0%**	**10,682**	**28,778**	**100.0%**	**10,919**

[1] Sum of the proposed Large Volume Program budget and the program budgets for all programs approved in the DSM Settlement Agreement (EB-2011-0325).

5. RATES IMPACT

The total amount of DSM spending to be recovered in 2013 rates as compared to 2012 approved rates for Rate T1, Rate T2 and Rate 100 customers is provided at Exhibit A, Tab 1, Schedule 1. DSM costs are included in approved delivery rates and are not separately identified. Although DSM costs are included in approved delivery rates and are not separately identified, Exhibit A,