KLIPPENSTEINS
BARRISTERS & SOLICITORS
160 JOHN STREET, SUITE 300,
TORONTO, ONTARIO M5V 2E5
TEL: (416) 598-0288
FAX: (416) 598-9520

July 19, 2013

BY COURIER (2 COPIES) AND EMAIL

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, Suite 2700
Toronto, Ontario M4P 1E4
BoardSec@ontarioenergyboard.ca

Dear Ms. Walli:

Re: Environmental Defence Interrogatory Responses
EB-2012-0451 – Enbridge Gas Distribution Inc. ("Enbridge")
GTA Pipeline Leave to Construct; EB-2012-0433, EB-2013-0074
Union Gas Ltd. ("Union") – Parkway West and Brantford-Kirkwall
Parkway D Projects

Please find enclosed the responses to the interrogatories to Environmental Defence.

Please do not hesitate to contact me if anything further is required.

Yours truly,

Kent Elson

cc: Applicant and Intervenors

Encl.

Environmental Defence Response to Board Staff Interrogatory #1

Reference: Exhibit L.EGD.ED.1, Executive Summary, Page 2 of 24

Please provide the estimated cost investments into DSM that would be required in order to meet the forecast annual average peak demand reduction potential.

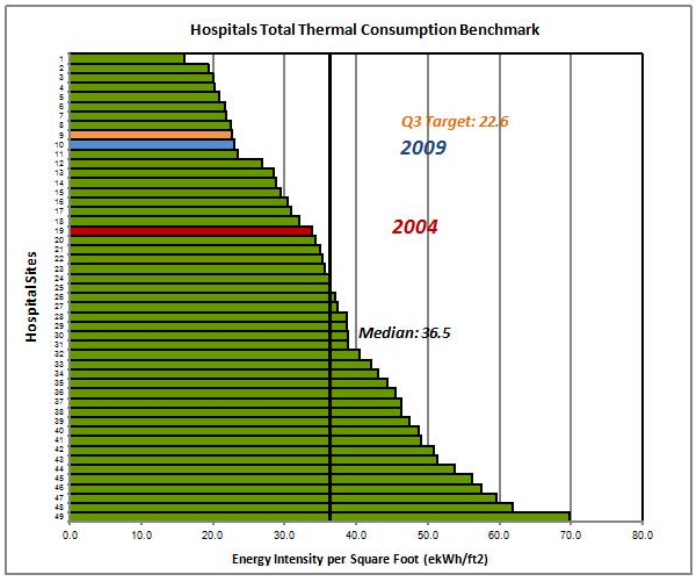
Response:

With the moderate contributions from Residential and Industrial sectors forecast in the model (35% of total 2025 savings at the median and 24% at the top quartile), only median level savings is required in Commercial and Apartment sectors to avoid net load growth to 2025 (see the model). The estimated cost investments into DSM by Commercial and Apartment building owners over the 12 year period to meet the median 2025 savings level (637,000,000 m3/year) is $475,000,000. The present value of associated gas savings from 2014 to 2030 (5 years after the end of the proposed program) is $841,000,000.

The estimated cost investments to meet the top-quartile savings level for Commercial and Apartment sectors (1,113,000,000 m3/year) is $1,350,000,000. The present value of savings over the same period 2014 to 2030 is $1,518,000,000. The payback for building owners on this investment is in the order of 3 years which is within the acceptable range for most owners.

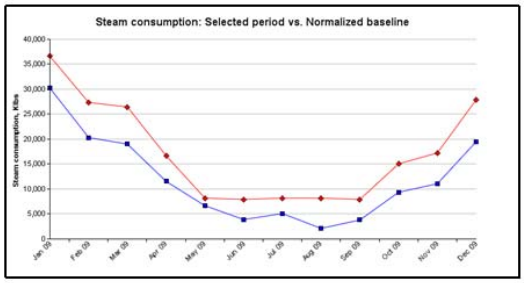
Actual cost investments for performance-based natural gas conservation programs are lower than most people expect. Incentive application reports prepared for EGD for the years 2006-2009 for Greening Health Care hospitals show (in aggregate) owner investment costs of $989,500 over the 4 years with recorded total gas savings of 7,336,000 M3/year. Using a 5 year measure life yields an average of DSM cost of 2.5 cents per M3. In fact, many of the buildings have been maintaining and improving on achieved savings for longer than 5 years, and owners expect the savings to continue indefinitely.

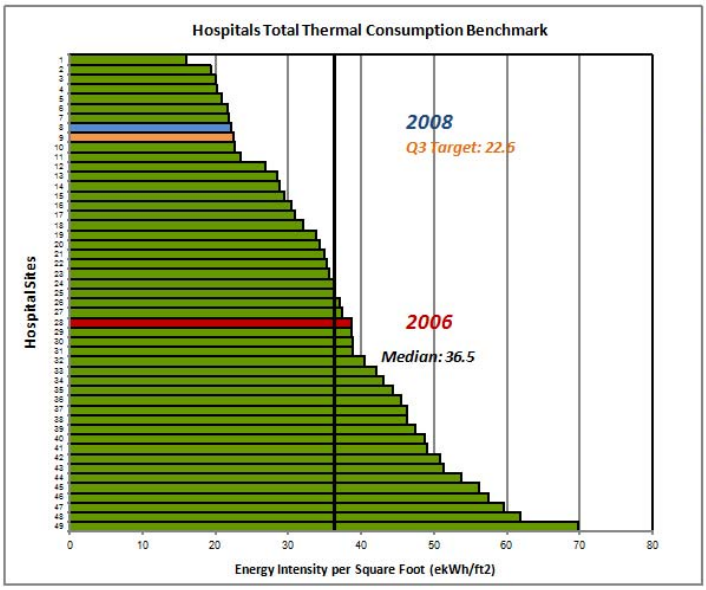
The following examples help illustrate the positive economics. The two hospital facilities have worked towards meeting the top-quartile performance target, and are now sharing their experience and inspiration with other hospitals in the Greening Health Care program. The major downtown hospital worked for five years to achieve these results. The cancer centre took two years to reach the target.



Major Downtown Toronto Hospital

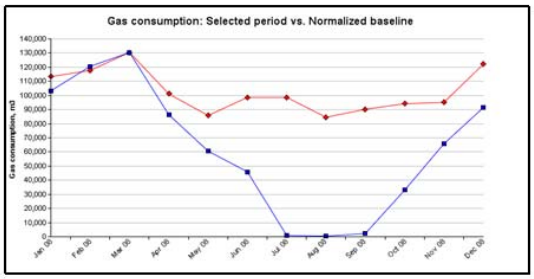
Savings Summary	
Building area	950,000 ft2
Total thermal % reduction	31.3
Gas equivalent (m3/year)	2,676,680
Capital cost of measures	$699,635
Annual cost savings ($0.175/M3)	$468,419





Regional Cancer Centre

Savings Summary	
Building area	100,000 ft2
Total thermal % reduction	39.9
Gas savings (m3/year)	490,766
Capital cost	$105,000
Annual cost savings ($0.175/M3)	$85,884



Environmental Defence Response to Board Staff Interrogatory #2

Reference: Exhibit L.EGD.ED.1, Executive Summary, Page 2 of 24

Please discuss the increase in market penetration (i.e. increase in participants) that would need to be realized in order for the forecast annual average peak demand reduction potential to be achieved.

Response:

Our proposed plan envisages EGD targeting building owners of large buildings and large portfolios of buildings, and using benchmarking and target-setting to identify their buildings with the highest potential for gas savings. Commercial building owners already collaborate in energy efficiency initiatives such as REApac benchmarking, BOMA BESt, Race to Reduce and Greening Health Care, which can help a great deal with awareness and engagement. Once owners are engaged, and their buildings assessed, technical support can be provided by EGD to assist them in identifying specific reasons for high gas use in each building, implementing the necessary improvements and verifying that savings are achieved and maintained over time.

EGD was unable to provide the requested breakdown of numbers of customers accounting for the largest gas consumption.[1]

However, consistent with the strategy stated above to focus engagement on customers with large buildings and large portfolios of buildings, we have refined our recommended approach to market engagement and penetration using gas savings potential data for commercial buildings from our database. The strategy is illustrated by Table 1 below, which lays out the first four years of a 12-year market engagement program. The following 8 years of the program would build on this foundation to achieve the modeled top-quartile gas savings of 822 million M3/year in 2025.

The proposed strategy is to engage buildings in each year of the program with a combined 75 million M3/year of gas savings potential so that, by the end of 11 years, the required 2025 top-quartile total of 822 million M3/year (as presented in the model) will be achieved.

Year One would target owners of large buildings – typically hospitals, major commercial and government office buildings and hotels, and universities. Our database contains 26 such buildings in the GTA (including office buildings in the Enbridge workshop for the Race to

[1] Exhibit JT2.36, Page 6 of 13, Page 13 of 13

Reduce as shown in Exhibit L.EGD.ED.1, Figure 12, Page 13) owned by 20 different organizations with identified potential savings totaling 24 million M3/year. Based on this, Year One would aim to engage in total about 60 owners and identify about 80 of their high gas savings potential buildings to achieve the target engagement of buildings with combined potential for 75 million M3/year.

We estimate that our database contains less than 20% of the large gas savings potential buildings in the GTA. Thus, the Year One program would engage and analyze these and other readily identified major owners to meet the year one target. The realization of the gas savings would then roll out over the following 2-3 years.

Year Two would lower the threshold to buildings with 200,000 M3/year of gas savings potential, of which our database of office, government and commercial office buildings contains 25 with combined gas savings potential of 6.6 million M3/year. Extrapolation for this size of buildings requires engagement of about 300 buildings to meet the 75 million M3/year goal. However, large portfolio owners, such as school boards, municipalities and retail chains, come into play so the number of targeted owners is proportionately less (estimated at 50).

Year Three lowers the threshold again to buildings with 10,000 M3/year gas savings potential which we estimate will require engagement of 500 buildings and 50 new customers (given that some customers engaged in years one and two will have buildings already identified in this range). Year 4 lowers the threshold to 50,000 M3/year, for which we estimate 1000 buildings and 50 new customers will be required.

Table 1 Market Penetration Model for Commercial Sector

	Year 1	**Year 2**	**Year 3**	**Year 4**
Gas savings engaged (M3)	75 million	75 million	75 million	75 million
Potential savings per building M3/yr.	> 500,000	> 200,000	> 100,000	> 50,000
# of targeted buildings/year	80	300	500	1000
# of new participants/yr.	60	50	50	50

Target customers	Commercial landlords; major hospitals; universities; major hotels; government	School boards (high schools); municipalities; colleges; large retail; other hospitals, hotels etc	Other retailers; long-term care operators	Banks (branches); school boards (primary schools);

Successful execution of this proposed strategy for the first four years will establish the relationships, processes and capabilities required in subsequent years of the program.

The Apartment sector also has large buildings, large portfolio owners, and collaborative programs in place (including the Federation of Housing Providers of Ontario, and the City of Toronto Tower Renewal Office). We anticipate that a similar model would apply.

Lower penetration rates are projected in the model for Residential and Industry, but the principles of performance-based conservation may be useful in these sectors as well.

Environmental Defence Response to Board Staff Interrogatory #3

Reference: Exhibit L.EGD.ED.1, Executive Summary, Page 2 of 24

Please discuss the timeframe needed to ramp up EGD's current DSM plan to one that achieves the forecast annual average peak demand reduction potential.

Response:

The response to OEB Staff-2 indicates the nature and scale of the further development of EGD's DSM programs needed to achieve the forecast savings. Enbridge already has many of the required relationships with programs and owners, and the technical foundations of Energy Compass and Run It Right. It would seem that the program development to support the proposed market penetration strategy could begin immediately, meet the annual engagement targets laid out in OEB Staff-2, and be completed over 3-4 years. This would include:

- Account managers engaging senior level executives at high profile, large building owner and management corporations
- Gas target-setting capability
- Consideration of time-limited premium incentives for reaching targets
- Technical capacity for identifying causes of high gas use in high potential buildings

Environmental Defence Response to Board Staff Interrogatory #4

Reference: Exhibit L.EGD.ED.1, page 13 of 24, Performance Based Conservation

Please discuss and provide examples and annual savings results of other jurisdictions that employ performance based conservation for natural gas DSM.

Response:

We are not aware of any gas DSM programs in other jurisdictions that employ performance based conservation. Preliminary research did not uncover the use of performance based conservation for natural gas DSM. However, performance based conservation is gaining rapid traction in industry led and other initiatives including Energy Star Canada's Portfolio Manager which includes target setting, REALpac, Civic Action, the Green Energy Act, etc. Leading energy conservation research conducted by such organizations as Lawrence Berkeley National Laboratory and others is focused on performance.

Environmental Defence Response to Board Staff Interrogatory #5

Reference: Exhibit L.EGD.ED.1, page 13 of 24, Performance Based Conservation

Please provide examples of other natural gas utilities in North America that have avoided or reduced an infrastructure expansion project due to the successful implementation of increased DSM funding. If there are examples, please explain what was reduced or avoided.

Response:

We could not find nor are not aware of such an example.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #1

Reference: Exhibit L.EGD.ED.1, Page 7 Figure 4: Peak Hourly Demand

a. Please explain the data sources used for the two graphs provided.

b. Please explain how the occupied data versus unoccupied data was obtained.

c. Please explain "BT=15 deg C" as noted in the legend in the graph on the left.

d. Please explain what outdoor air temperatures were used, the data source, and the location of measure.

Response:

a. Enbridge provided the hourly demand for GTA for the last 3 years (I.A4.EGD.ED10).

b. This was obtained by applying occupied hours set at 6am-9pm Mon-Fri (excluding statutory holidays) to the hourly demand data.

c. "BT=15 deg C" indicates the balance temperature. It was labeled incorrectly and should be labeled as "BT=18 deg C" which is the balance temperature Enbridge uses.

d. Outdoor air temperatures come from Environment Canada data gathered at the Toronto City weather station.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #2

Reference: Exhibit L.EGD.ED.1, Page 2, paragraph 1

a. Please provide a working version of the "Performance-Based Model" with all formula and data intact.

b. Please identify the "different building types" classifications.

Response:

a. We have provided a working version of the model.

b. Different building types are apartments, hospitals, schools, office buildings, recreational facilities, and retail.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #3

Reference: Exhibit L.EGD.ED.1, Page 3, paragraph 1.

a. What constitutes a "large multi-year database"? Is it the database consisting of 638 buildings cited in Figure 3 on page 5?

b. Does the database (sample) represent a random selection of the entire building stock or is it based on participating buildings only? What are the confidence intervals associated with this sample size compared to the EGD data set of over 70,000 buildings overall and in each of the sectors?

c. Does that database include Ontario only buildings or buildings from other provinces as well?

d. Please confirm if Enerlife's "large multi-year database of energy use by buildings" contains the following information

   i. All the gas consuming appliances/equipment for each building

   ii. Age of the building stock

   iii. The capital improvements that have been performed on the building to date

   iv. Energy efficiency upgrades/improvements that have been completed on the building

e. Please provide specific data sets required to establish the energy intensity of any building.

f. Please provide the results of the regression analysis and supporting algorithms used to establish benchmark comparisons across different building types.

Response:

a. The data is taken from 2008 to 2010. Yes, the database for this time period consists of 638 buildings.

b. The database of building data comes from self-selected buildings participating in various programs. There is nothing to suggest that they are not representative of EGD's data set. These programs have been running for a number of years.

c. The database includes buildings from other provinces.

d. The answers as to what Enerlife's database contains are as follows:

a. No.

b. Yes.

c. Yes for some buildings but not all.

d. Yes for some buildings but not all.

e. These data sets are comprised of numerous data sets provided by individual owners that cannot be shared to protect confidentiality. The data is sensitive commercial information of those building owners. The building owners provided this data to Enerlife based on the understanding that it would be kept strictly confidential. In many cases, Enerlife's obligation to keep a building owner's data confidential is set out in a written contract.

   This data is also proprietary. Providing it in this proceeding would likely harm Enerlife's financial competitive position.

f. The regression analysis and supporting algorithms are proprietary and cannot be provided. Providing this information would likely harm Enerlife's financial competitive position. This information is also not relevant as sufficient information has been provided to assess and test Enerlife's model.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #4

Reference: Exhibit L.EGD.ED.1, Page 2, paragraph 3.

a. How are buildings chosen for the Canada Green Building Council program? For example, are the buildings chosen because they are laggards, and use a relatively high level of energy?

b. What percentage of those projects' savings is as a result of operational versus capital improvements/investment?

c. Similarly, what portion of the cost of the project is driven by capital versus operational improvements/investment?

Response:

a. The question does not relate to the paragraph cited above as the initiatives mentioned are not part of the Canada Green Building Council program. Buildings are not chosen for any of these programs and initiatives; the owners/operators chose to participate.

b. This reference relates to setting targets not project savings. However, typically operational measures account for 50% of the total savings.

c. Similarly, this refers to setting targets not undertaking projects. Operational improvements typically constitute low cost or no cost measures, so a larger portion of the cost will be driven by capital.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #5

Reference: Exhibit L.EGD.ED.1, Page 13, Figure 12 "Race to Reduce – Gas Conservation Action Plan Workshop Results" and Page 2, paragraph 5

a. Please confirm your understanding that Enbridge is a founding participant in the Race to Reduce programs.

b. Please confirm that Figure 12 on page 13 have been created solely from performance benchmarking data, without any detailed investigation and planning regarding the specific buildings themselves.

c. Is the sample of 32 buildings representative of current building stock?

d. Has there been a review or update of the specific building information cited in Figure 12?

Response:

a. We understand that Enbridge is a founding participant in the Race to Reduce initiative.

b. Correct.

c. The sample of 32 buildings is of office buildings who were interested in reducing gas use in their buildings from the Race to Reduce initiative.

d. No review or update of the building information has been conducted by Enerlife.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #6

Reference: Exhibit L.EGD.ED.1, Page 2, paragraph 1

a. Environmental Defence cites the Performance-Based Model as a method for calculating DSM Potential. Are there any utilities in major cities in North America using this method? If not, why not?

b. Please confirm that performance benchmarking simply provides a starting point for further inquiry, and that detailed investigation and planning is required to establish realizable savings levels for any particular building.

c. Please provide the date when the Performance Based model was first prepared and describe how it, "more completely represents the effects of DSM on the peak hour demand forecast."

d. Please provide all assumptions used in the Performance based model and how the model was calibrated to actual peak hour consumption for natural gas and provide the hourly calibration data by sector and degree day (as available).

Response:

a. We are not aware of any, nor have we conducted any investigation of this.

b. Performance benchmarking and target setting provides the most reliable determination of realizable savings levels for any particular building, leading to detailed investigation of specific improvements required. At an aggregate level, performance benchmarking is also the most reliable determination of realizable savings.

c. This model was prepared for this evidence. It more completely represents the DSM potential since it applies savings to the whole building stock rather than just new customers. Rather than a" "broad based" top down estimate of the reduction of peak load "due to energy efficiency measures" and using "gate station daily demand trends"[2]; the Performance Based model is built from the bottom up based on gas reduction potential in the various sectors.

d. The assumptions are in the working model provided.

[2] Exhibit I.A4.EGD.ED.13, Page 2 of 2; Exhibit JT2.36, Page 6 of 13

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #7

Reference: Exhibit L.EGD.ED.1, Page 2, paragraph 4.

a. Have you reviewed the recommissioning program outlined in the 2009 DSM Potential Study by Marbek? Please confirm your understanding that it has been identified as the single largest potential category in the commercial marketplace by 2017 in the Marbek report?

b. Please clarify how the measures listed in the above reference are different than the "recommissioning" programs captured in that Study.

c. Please clarify

how these measures in the reference are different than our current Run it Right program, Energy Compass program, and Custom Project opportunities.

Response:

a. We have reviewed the 2009 DSM Potential Study by Marbek but did not find any description of the scope of a recommissioning program for the commercial market. We confirm that recommissioning was identified as the single largest potential category in the commercial marketplace in the Marbek report, but do not know what this entails.

b. As indicated in the response above, we could not find a description of the "recommissioning" program in the Study.

c. The difference is in the use of energy targeting, using benchmarking to establish performance indicators, and identifying and correcting specific inefficiencies in individual buildings using these data.

d. These measures are part of a systematic, step-by-step approach that incorporates strategic system testing and rebalancing based on performance indicators and leads to achieving target energy performance.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #8

Reference: Exhibit L.EGD.ED.1, Page 17, Appendix A.

a. Please define "potential" as used in the Terms of Reference and in the EnerLife Report. Does it refer to Technical Potential, Economic Potential or Achievable Potential as used in DSM potential studies?

Response:

Our model provides Achievable DSM potential.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #9

Reference: Exhibit L.EGD.ED.1, Page 3, paragraph 1.

Using the summary table, please provide comparable information on the Performance Based Forecast model as a tool to forecast natural gas DSM potential in the GTA.

Response:

	DSM Potential Study	Performance-based Forecast Model
Data set	All EGD commercial and apartment customers	Detailed multi-year benchmarking and savings data on 638 individual buildings in our commercial and apartment database.
Data sort capabilities	By sector By consumption data Building archetypes developed for each sector based on customer data and information from other sources on market penetration of efficient equipment, stock replacement rates etc.	By sector and sub-sector (e.g. hospital types, school types) By consumption data, weather-normalized energy intensity, gas intensity, savings potential, base thermal intensity, heating thermal intensity, building size, building age, location, etc. By measures implemented and actual savings achieved.
Analysis of potential savings	Individual measures are screened for Cost-effectiveness. Measures are applied to building archetypes in the model as applicable and resulting energy savings compared to reference case.	Target setting methodology (market reviewed), based on real performance of actual buildings
Savings Potential	Calculated for Technical Potential, Economic Potential and Achievable Potential	Calculated and regularly updated based on real performance of actual buildings
	Achievable potential calculated at different funding scenarios	Documented costs and savings from real projects
	Achievable potential savings of 15% in the Commercial sector at financially unconstrained	Achievable cost effective potential savings of 32% in the Commercial and 29% in Apartment sectors

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #10

Reference: Exhibit L.EGD.ED.1, Page 13, Figure 13 "GTA Project Influence Area (derived)"

a. Please clarify what is meant by # of customers with high gas savings? Does this mean that the column is showing how many customers have the opportunity for high gas savings?

b. Enbridge cannot understand some of the data in Figure 13. In particular in the column entitled "Customers with high gas savings" the Total line shows 13%. When we calculate that particular value, in the same way that we were able to reconcile the cells above for the various sectors (i.e. # of customers with high gas savings ÷ # of customers or in this specific table 70,041 ÷ 1,167,454), we come up with 5.9995%. How was 13% achieved? Please provide sources and any calculations for the derivations outlining relevant assumptions.

c. Where have the data points in the column entitled "% of potential savings" come from? Please provide sources and any calculations for the derivations outlining relevant assumptions.

d. Please explain the discrepancies between the "Average savings potential" of 25% shown in Figure 12 and the 48% of potential savings outlined in Figure 13?

e. Where have the data points in the column entitled "106 m3 savings" come from? Please provide sources and any calculations.

Response:

a. This is an estimation of the number of customers need to be reached in order to achieve the savings. Enbridge made no distinction between buildings and customers, which is not always the case. Therefore this is a conservative estimate and in reality fewer customers need to be reached to achieve the savings. No, this is not how many customers have the opportunity for high gas savings.

b. Please refer to our response to Interrogatory OEB Staff-2 for the details of our approach to market penetration. Please refer to the working model provided for calculation. The model indicates 75% of the commercial customers effectively account for all the savings.

c. The % of potential savings is the percentage achievable of the percentage potential savings—i.e. 100% of the apartment and commercial potential (21%median 33% top quartile for

commercial, and 23%median 28%top quartile for apartment) is achievable by 2025; 16% of the 34% residential potential is achievable by 2025 (16%x34%=5.25%); 38% of the 40% industrial potential is achievable by 2025 (38%x40%=15%). Please see model provided.

d. There is no discrepancy. These two numbers are unrelated. The average building savings potential for Figure 12 is based on 32 participating commercial buildings in the Race to Reduce workshop. 48% in Figure 13 is the overall achievable percentage of the potential savings for all four sectors. Please refer to the model provided.

e. The column is calculated as= "%potential savings" x "savings potential" x "106 m3 volume".

- % potential savings is the % of the savings potential achievable by 2025;
- Savings potential is derived from our database of 638 buildings;
- 106 m3 volume is from Enbridge's Exhibit JT2.36.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #11

Reference: Exhibit L.EGD.ED.1, Figure 6

How were the 8.3% and 21.8% reductions calculated for the commercial median and top quartile scenarios respectively? Similarly, how were the 4.3% increase and 10.3% reduction calculated for the apartment median and top quartile scenarios respectively?

Response:

Please refer to the model provided.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #12

Reference: Exhibit L.EGD.ED.1, Page 2, par 4 and Page 3, par 3.

a. Please provide the scope of each of the pilots.

b. How much time and resources were involved in the pilots that are referred to in these references?

c. What is the cost of the pilot projects (including all overhead, program costs and incentive costs)?

d. What timeline is considered "quite quickly" in the first reference?

e. What percentage of the programs would be TRC positive?

f. Have the pilots been subjected to a third party audit? And if so, what were the results?

g. Has there been a review or update of the specific building information cited in Figure 12 – Race to Reduce – Gas Conservation Action Plan Workshop Results?

h. Market transformation assumes increased market share of new technologies and/or approaches to the point where they are widespread enough to become institutionalized and ultimately included in standard codes and practices. How is this pilot considered market transformation? What is considered as a remarkable pace of market transformation in this example?

Response:

a. These pilots were aimed at understanding the energy and water performance of existing buildings across Canada, helping building owners and managers track the energy and water use and establish performance metrics and baselines. In addition, the applicability of LEED for Existing Buildings was tested prior to its introduction into Canada. Initially, the pilots began in 2008 aimed at commercial office buildings, administrative buildings, and K-12 schools. The pilots provided valuable system level energy use metrics including lighting, fan and pump power, water fixtures, building envelope, and equipment. Results demonstrated that even top-performing buildings had room for improvement. The pilots were extended to include post-secondary institutions, arenas, banks and credit unions, which took place from 2009-2011. As each pilot concluded, the buildings transitioned into an ongoing program now managed by the CaGBC called GREEN UP.

b. Each pilot took place over the course of one year, with a summary report published 6 months later. The pilots ran from 2008 – 2011 as detailed above. The pilots were run by a single project manager, with support from a technical expert, some data management support and administrative support.

c. Each building owner participant in the pilot programs paid a participation fee which funded the program. In some jurisdictions, governments or utilities defrayed some or all of the cost of participation but most participants paid the full price. Incentives were not part of the pilot scope. The entire total cost of the pilots is not known by Enerlife, as the pilots were administered by the Canada Green Building Council. In the earliest Annual Report (2011) published by the Canada Green Building Council, GREEN UP had expenditures of $208,132 in 2011 and $431,825 in 2010. This would include both pilot and ongoing program costs.

   Also, the information requested is likely not relevant. The costs and resources involved in the pilots are not analogous to the costs and resources involved in utility DSM program. For example, the pilots were voluntary and did not involve incentives. In other words, the costs of the pilots would not shed light on what the costs might be for a performance-based DSM program run by a utility.

d. Typically energy savings are achieved within a few months of project initiation with full implementation and savings achieved within two to three years.

e. Enerlife does not have the requested information and is not aware of it ever being calculated. Also, the information requested is not relevant as it relates to pilots which were designed with different goals in mind, as compared to a gas utility DSM program, such as gaining deeper insight into building performance in various sectors in Canada.

f. Our understanding is that no savings were verified. It was not a utility DSM program, so a third party audit as is typically associated with DSM programs would not be required under these circumstances.

g. Although this question does not relate to the reference cited, as stated Enerlife is not aware of and has not conducted any review or update of the specific building information cited. Enbridge Energy Solutions Consultants attended the workshop with the understanding that they would follow up with the buildings.

h. The pilots cited in the reference pilot are considered transformative because they rapidly increased the market's adoption of a performance based approach to energy reduction starting with benchmarking and including targets and metrics derived from benchmarking. It is remarkable as in the space of 5 years from the inception of the pilots in 2008, a

performance based approach to energy reduction has become widespread, and buildings are achieving targeted results.

This is exemplified by recent industry led initiatives such as the REALpac 20 by ‘15 Target, REALpac’s Energy Benchmarking, BOMA’s annual Energy Benchmarking report, Civic Action’s Race to Reduce, etc. Government and standard initiatives include Energy Star Canada, Ontario’s Green Energy Act, ASHRAE’s Performance Measurement Protocols for Commercial Buildings: Best Practices Guide, New York City’s Greener, Greater Buildings Plan, etc.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #13

Reference: Exhibit L.EGD.ED.1, Page 2, paragraph 3.

a. How are buildings chosen for the Canada Green Building Council program? For example, are the buildings chosen because they are laggards, and use a relatively high level of energy?

b. What percentage of those projects' savings are as a result of operational versus capital improvements/investment?

c. Concurrently, what portion of the cost of the project is driven by capital versus operational improvements/investment?

Response:

a. Please refer to response to Interrogatory EGD-4

b. Please refer to response to Interrogatory EGD-4

c. Please refer to response to Interrogatory EGD-4

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #14

Reference: Exhibit L.EGD.ED.1, Page 2, paragraph 5.

a. What are the program costs for Toronto & Region's Conservation programs and CivicAction's Race to Reduce programs?

b. Are the programs TRC positive?

c. What is the cost of the program per m3 saved?

Response:

a. Enerlife is not privy to the program costs for Toronto and Region Conservation programs and Civic Action's Race to Reduce initiative. Toronto and Region Conservation publishes annual reports, however discrimination by program or sector is not provided. Their overall costs for 'Conservation and education programming' are $17,461,480 for 2011 (most recent year published). CivicAction does not publish annual reports. The Race to Reduce initiative is led by and is primarily driven by industry volunteers, with the support of CivicAction staff and volunteers. We believe the initiative is funded through private and public support from organizations such as TD Bank, RBC, Manulife, as well as the Ontario Power Authority, Toronto Hydro and Enbridge.

b. Please see response to Interrogatory EGD 12e.

c. Please see response above.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #15

Reference: Exhibit L.EGD.ED.1, Page 5, paragraph 1

a. In the TRC equation, incentives are not factored into determining the TRC ratio. Please estimate the incentive costs required to drive the median performance target.

b. Please estimate the total DSM budget that would be required (including all program costs and overhead costs, etc.) to achieve the "median performance target" and the "top quartile performance target"?

c. If possible, please calculate the Program Administrator Cost Test to achieving the median performance. If it is not possible, please state why.

d. Please provide your calculations and assumptions for the responses to (a) – (c).

Response:

a. The incentive costs would be $76,440,000 to reach the median performance target. By the end of 2025, median gas savings for Commercial and Apartment sectors would be 637 106 m3 per year. We project $0.12 per m3 average incentive rate to drive this target, allowing for graduated and time limited incentives to drive progress to targets within this timeframe, which equals the amount above.

b. We estimate the DSM budget over the course of the program as follows:

	MEDIAN TARGET	**TOP-QUARTILE TARGET**
Account Management	$11,000,000	$11,000,000
Technical Support	$63,700,000	$111,300,000
Marketing and Sponsorship	$3,300,000	$3,300,000
Incentives	$76,440,000	$133,560,000
TOTALS	$154,440,000	$259,160,000
Average Annual Cost	$14,040,000	$23,560,000
Total Gas Savings m3 (2015-2030)	6,912,000,000	12,072,000,000
Average Cost/m3	$0.022	$0.021

c. The PAC Test to achieve the median performance for Commercial and Apartment sectors as shown above is as follows:

Avoided Supply Cost (discounted) from 2015-2030	$841,000,000 (see model)
Incentive Costs	$76,440,000 (see above)
Program Costs	$78,000,000 (see above)
Net Savings	$686,560,000

d. Key assumptions are as follows:

Account Management	$1,000,000/year for 11 years
Technical Support	$0.10 per m3/year savings
Marketing and Sponsorship	$300,000/year for 11 years
Incentives	$0.12 per m3/year savings
Life of Savings	2015-2030

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #16

Reference:

Prior to 2013, and anytime in the past decade, has ED provided any formal or informal documentation suggesting to Enbridge that it consider and/or calculate peak load reductions versus annual load reductions? If so, please produce any documentation.

Response:

This question is not relevant, including because Enbridge's obligation to assess whether increased DSM is a preferable alterative to supply-side investments, which would presumably include an assessment of the impact of DSM measures on peak load, is not dependent on whether any intervenor has suggested to Enbridge in the past that it should calculate the peak load reductions resulting from its DSM programs.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #17

Reference: Exhibit L.EGD.ED.1, Page 12, par 1, Section 3.1.

Given the process for performance based conservation outlined above, please confirm that such an approach is not practical or cost-effective for large quantities of small commercial customers.

Response:

On the contrary, this performance based approach may be the most practical approach to these customers.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #18

Reference: Exhibit L.EGD.ED.1, Page 14, Section 4.2.

a. Please confirm that the current DSM framework and its programs are focused on, measured by, and incented by m3 savings of natural gas.

b. Please confirm that Enbridge's DSM framework is a "savings focused approach."

Response:

a. The current DSM framework and its programs appear to be measured by and incented by m3 savings of natural gas but predominantly focused on implementing measures, rather than getting at savings. By savings focused approach we mean using energy performance and benchmarking to determine where the savings are to be found rather thanlooking for where to apply specific measures.

b. Enbridge's DSM framework appears to be moving in this direction. The Marbek study indicates a measure-based approach or what is also termed "traditional DSM." Enbridge's recent DSM programs include some elements of performance based conservation.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #19

Reference: Exhibit L.EGD.ED.1, Page 14, Section 4.2.

a. Please define the educational or experiential background required of the above described persons.

b. Please confirm that Enbridge's DSM department and Enbridge's partners, including Enerlife, employ individuals with the skill sets described in the above quote and the answer to part a.

Response:

a. Engineers and technologists with a strong background in energy analysis and real building performance, with facilitation and communications skills.

b. We can confirm that Enerlife's employees have these skill sets but cannot confirm for any other partner nor Enbridge's DSM department.

Environmental Defence Response to Enbridge Gas Distribution Inc. Interrogatory #20

Reference: Exhibit L.EGD.ED.1, Page 17, Appendix A -Terms of Reference.

Please define "potential" in L.EGD.ED.2 page 4, section 1.0, Performance- Based DSM Forecast Methodology. Is it achievable potential (and if so, based on what financial scenario), technical potential, or economic potential?

Response:

It is achievable potential for apartment and commercial buildings. It is based the financial scenario outlined in the response to Interrogatory OEB Staff-1.

Environmental Defence Response to Energy Probe Interrogatory #1

Reference: Exhibit L.EGD.ED.1, Page 1

Please provide additional analysis to demonstrate this reduction is readily attainable in the timeframe involved.

Response:

Please refer to the responses to Interrogatories 1.0 OEB Staff-1, OEB Staff-2 and OEB Staff-3, as well as the model provided.

Environmental Defence Response to Energy Probe Interrogatory #2

Reference: Exhibit L.EGD.ED.1, Page 1, Table 1

a. Please provide the underlying calculations for the commercial (30.3 103m3/hr) and apartment sectors (9.5 103m3/hr).

b. Please confirm the timeframe assumed to achieve these savings.

Response:

a. Please refer to model provided.

b. From 2014 – 2025.

Environmental Defence Response to Energy Probe Interrogatory #3

Reference: Exhibit L.EGD.ED.1, Page 2

Please summarize the advantages and disadvantages of Enerlife's Performance-Based Model compared to the approach used by Marbek Resources Consulting Inc. in the DSM Potential Study conducted for Enbridge in 2009.

Response:

Please see response to Interrogatory No.1.0 EGD-28.

Environmental Defence Response to Energy Probe Interrogatory #4

Reference: Exhibit L.EGD.ED.1, Page 2

Please identify the "other parties" and explain their potential roles.

Response:

The other parties would include collaborations with electric Local Distribution Companies ("LDC") and participation and support of industry and government initiatives referenced in our evidence and any other programs or initiatives that would arise.

Environmental Defence Response to Energy Probe Interrogatory #5

Reference: Exhibit L.EGD.ED.1, Page 3

a. Please confirm the number of years that Enerlife has energy use by buildings data in its database.

b. Has Enerlife conducted multi-year projects for the apartment sector? If yes, please provide details.

Response:

a. 13 years.

b. Enerlife has conducted multi-year projects for the apartment sector in conjunction with the Ontario Power Authority, Federation of Rental-Housing Providers of Ontario, Social Housing Services Corporation and the City of Toronto.

Environmental Defence Response to Energy Probe Interrogatory #6

Reference: Exhibit L.EGD.ED.1, Page 4

Preamble: Enerlife provides benchmarking results for offices, schools, hospitals, retail, recreation and apartments, and overall potential gas savings resulting from reaching the median and top-quartile gas consumption levels.

a. For the apartment and commercial sectors, please discuss the timeframe needed to reach median savings and top-quartile savings.

b. For the apartment and commercial sectors, please provide the investment needed to reach median savings and top-quartile savings.

Response:

a. The proposed time frame is 2014 – 2025.

b. Please see response to Interrogatory OEB Staff-1

Environmental Defence Response to Energy Probe Interrogatory #7

Reference: Exhibit L.EGD.ED.1, Page 5

Preamble: Enerlife indicates the present value of avoided commodity costs for attaining the median performance target is $734 million and for the top quartile target is $1,094 million.

Please provide the calculation for both performance levels.

Response:

The calculations are in the model provided.

The figures cited in the question are for the period between 2015 and 2025. The Commercial and Apartment market avoided commodity costs are $841 million for median performance target attainment and $1,518 million for top quartile for the period between 2015 and 2030. This longer period provides a better estimate of the actual avoided costs because the efficiency measures will persist and continue to provide savings for a considerable period of time, and at least for 5 years. See also the response to Board Staff Interrogatory # 1 to Environmental Defence.

Environmental Defence Response to Energy Probe Interrogatory #8

Reference: Exhibit L.EGD.ED.1, Page 5

Preamble: The evidence states “Enbridge’s current DSM programs capture 0.6% of their annual volume, while the Performance-based Model forecasts capturing 1.6% of the annual volume for the median target and up to 3.5% for the top quartile target as savings”.

Please provide the underlying calculations for the Performance-based Model forecasts.

Response:

Please refer to model provided.

Environmental Defence Response to Energy Probe Interrogatory #9

Reference: Exhibit L.EGD.ED.1, Pages 4 & 5

Preamble: The potential annual DSM savings potential for the apartment sector differs between Figure 2 and Figure 3. Please explain.

Response:

Figure 2 is peak hourly savings potential. Figure 3 is annual volume of savings potential based on our benchmarked buildings.

Environmental Defence Response to Energy Probe Interrogatory #10

Reference: Exhibit L.EGD.ED.1, Page 6

Preamble: The evidence indicates the previous Peak Breakdown numbers inform the Peak Hourly Demand Forecasts. Since this breakdown is not known for each sector, the same breakdown is used for Apartment, Commercial, Industrial and Residential.

Please discuss the impact on the results if a different breakdown was used for each sector.

Response:

The impact is minimal—the overall breakdown of heating and base for all sectors will need to match the actual interval data which is 16% for base thermal and 84% for heating. By varying the breakdown within each sector the results do not differ much. Formulae are built into the attached model so they can be varied—to change sector breakdown change the row I34:T34 in "Forecast tab" so that W29:W30 remain the same.

Environmental Defence Response to Energy Probe Interrogatory #11

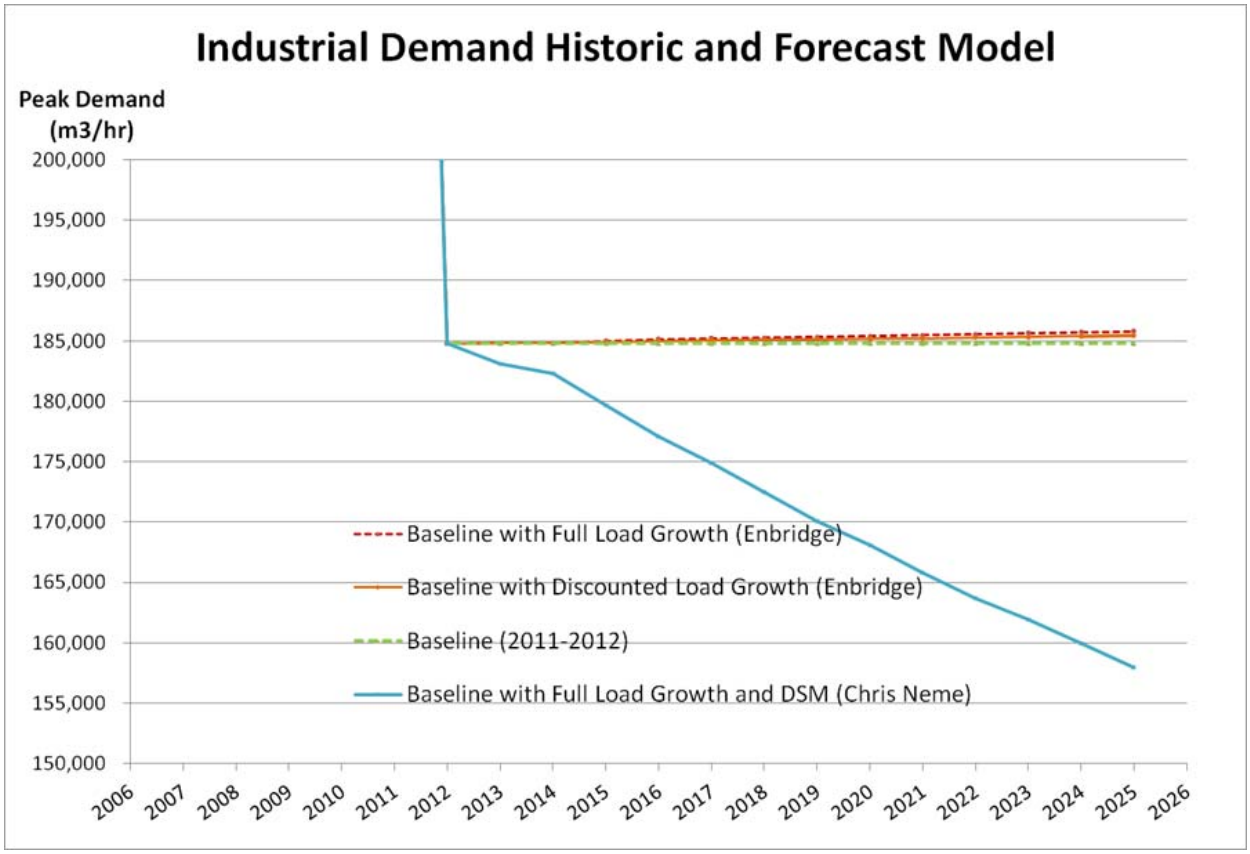
Reference: Exhibit L.EGD.ED.1, Page 10, Figure 10

The Baseline with Full Load Growth (Enbridge) and Baseline with Discounted Load Growth (Enbridge) is not shown on Figure 10. Please provide a revised Figure 10 with this information.

Response:

They both almost overlap with the baseline and the change is so small it is not visible. We have provided a view on the same graph that should show this more clearly.

Figure 10 Industrial Demand Historic and Forecast Model



Environmental Defence Response to Energy Probe Interrogatory #12

Reference: Exhibit L.EGD.ED.1, Page 12

Preamble: Enerlife indicates the work involved in equipment repairs and replacement, right-sizing and rebalancing, refurbishment and reprogramming, typically provides relatively short payback periods.

Please discuss payback periods for each sector from the customer perspective and based on experience, the payback periods customers find reasonable to take action.

Response:

Based on experience, generally customers are looking for payback periods that are 5 years or less. Measures typically identified through this process are low cost or no cost measures and therefore have paybacks that are well within this threshold.

Environmental Defence Response to Energy Probe Interrogatory #13

Reference: Exhibit L.EGD.ED.1, Pages 12-13

Preamble: Enerlife piloted an approach in 2012 that began with identification of buildings with the greatest potential for savings and level of reduction possible.

a. Please provide the key milestones for the pilot in 2012 and the corresponding timelines.

b. Please discuss the uptake in terms of implementation of the customized gas conservation action plan and identify the savings achieved.

Response:

As indicated in our response to Interrogatory EGD-39 and Interrogatory EGD-19, we have not conducted any subsequent work to the workshop identifying high gas savings potential building. This work was conducted at the end of 2012 with the aim of determining the potential for this group of buildings only. Enbridge's Energy Solutions Consultants were to follow up with the buildings directly to initiate implementation.

Environmental Defence Response to Energy Probe Interrogatory #14

Reference: Exhibit L.EGD.ED.1, Page 13, Figure 13

Please explain how the last two columns were derived. Please explain how the relative potential savings were determined for each customer sector (i.e. 100% of potential savings for apartment sector).

Response:

Please see response to Interrogatory EGD-33 for reference to second-last column.

The last column is calculated as (annual volume)x(% of potential savings) x (median savings potential).

Environmental Defence Response to Energy Probe Interrogatory #15

Reference: Exhibit L.EGD.ED.1, Page 1

Preamble: Enerlife concludes that all load growth in the GTA area can be completely offset through commercial and apartment DSM and that overall demand can be significantly reduced with the addition of residential and industrial DSM.

a. Please discuss potential obstacles to DSM implementation.

b. Please discuss the impact on offsetting load growth under the following scenarios:

   1. 25% shortfall in commercial and apartment DSM
   2. 50% shortfall in commercial and apartment DSM
   3. 75% shortfall in commercial and apartment DSM

Response:

a. The primary challenge to DSM implementation is to embed the understanding and practice of performance based conservation in building owners, utility company representatives and the buildings industry.

b. Please refer to the working model provided.

Environmental Defence Response to

Federation of Rental-Housing Providers of Ontario Interrogatory #1

Reference: ED Evidence

Preamble: ED has proffered a significant amount of evidence of the merits of DSM as replacement for or deferral of the infrastructure investment in Segment B.

a. Beyond the potential environmental, transportation or commodity benefits, from a pure distribution cost point of view, please provide ED's estimate of the costs to generate the DSM benefits predicted and compare those costs to those of the projected annualized costs of the infrastructure investment for Segment B in the EGD evidence.

Response:

Please see response to Interrogatory OEB Staff-1

Environmental Defence Response to

Federation of Rental-Housing Providers of Ontario Interrogatory #2

Reference: Ex. L, ED.1, Page 2

a. Please provide a derivation or working sheets for how the "commodity costs" in the last paragraph were calculated.

b. To the extent that distribution rate savings were incorporated, please specify whether potential increases in distribution rates were calculated that would result from decreased annual throughput.

Response:

a. The commodity costs are taken from Exhibit A. Tab 3. Schedule 5

NPV Assumption	
GJ/10^3m3	
	37.69
Discount rate	
	5.88%
Commodity Cost	
	($/GJ)
2015	4.65
2016	4.7
2017	4.83
2018	5
2019	5.2
2020	5.28
2021	5.32
2022	5.4
2023	5.4
2024	5.44
2025	5.44

b. Distribution rates were not included.