GEC Response to Union Gas Interrogatory #1

Question:

Reference: L.GEC.1, Pages 9-10

> *Preamble: At section III.2, Mr. Neme states that "as Figure 1 shows, leading jurisdictions have already achieved savings levels (actuals for 2014) that are on the order of twice the average of what Enbridge and Union are forecasting to achieve…. "*

Question: Union would like to better understand the information provided in Figure 1.

a) For Vermont, Massachusetts, Rhode Island and Minnesota please provide the following for each sector (Residential, Commercial and Industrial):
   i. 2014 Throughput
   ii. 2014 Number of customers per sector
   iii. 2012 Sales volumes per sector
   iv. 2012-2014 annual natural gas savings in cubic meters achieved through DSM programs
   v. 2012-2014 cumulative natural gas savings in cubic meters achieved through DSM programs
   vi. 2012-2014 Natural Gas DSM program budgets (per sector and total portfolio)

b) Please confirm the extent to which the U.S jurisdictions cited in Figure 1 have a Large Volume customer mix (i.e., number of customers, customer type, throughput volumes, sales, etc.) comparable to that of Union's franchise area.

Response:

a) See the table below. Note that Mr. Neme does not have the requested 2014 data on sales and customers; 2012 values are presented instead. Considerable effort was required to assemble just the 2014 program savings and spending by sector, so that is the only year provided. Lifetime energy savings were not readily available for Minnesota.

   Note that in the course of preparing this response, Mr. Neme discovered two errors in his previous estimation of savings as a percent of sales for Minnesota.[1] The correct value is 1.04% rather than the 1.34% previously estimated. However, it should be noted that the corrected value of 1.04% masks significant variability within the state, ranging from about 0.3% for one utility to between 1.2% and 1.3% for two of the three largest utilities. It should also be noted that these values are presented as savings from DSM eligible customers as a percent of total sales from all customers. Large customers in Minnesota

[1] The prefiled evidence will be corrected shortly.

have an option to opt out of DSM programs and many have chosen to do so. Minnesota savings as a percent of sales to eligible customers is appreciably higher in some cases. For example, Excel Energy reported that its 2014 savings as a percent of eligible sales was close to 1.7%.

Some jurisdictions appear to allocate overhead and other costs not directly related to individual programs to a non-program budget category, whereas others appear to simply allocate all non-program costs to programs. That is why the budget row for "regulatory/other" is blank in some cases.

Finally, the blank in the low income budget and savings rows for Vermont Gas' does not mean that it does not address low income customers. Vermont Gas simply includes treatment of low income buildings in its Residential New Construction and Residential Retrofit programs. The spending on, and savings from, the low income participants in those programs are not separately reported, even though the programs have different strategies for the low income segments of the market. Also, it should be noted that as part of a long-standing Vermont state policy Vermont Gas customers pay a 0.5% gross receipts tax on their bills to pay for state administration of a low income home retrofit program. Neither the costs nor the savings from that program are included in the table.

		VT	MA	RI	MN
Number of Customers (2012)					
	Residential	39,917	1,411,717	228,487	1,364,174
	Commercial	5,535	119,742	21,442	125,831
	Industrial	38	6,027	56	1,225
	Total	45,490	1,537,486	249,985	1,491,230
Sales Volumes (m3 in 2012)					
	Residential	85,280,468	3,206,807,568	449,770,294	2,908,609,482
	Commercial	65,522,055	1,966,788,808	285,725,638	2,236,586,473
	Industrial	76,770,020	1,212,578,171	222,023,205	2,877,751,427
	Total	227,572,544	6,386,174,548	957,519,137	8,022,947,382
DSM Spending (2014)					
	Residential	$ 1,536,730	$ 98,897,476	$ 9,829,100	$ 23,545,912
	Low Income	$ -	$ 38,284,014	$ 4,246,800	$ 5,040,259
	C&I	$ 714,125	$ 33,914,584	$ 5,586,800	$ 12,156,533
	Regulatory/other			$ 370,900	$ 3,995,914
	Total	$ 2,250,855	$ 171,096,074	$ 20,033,600	$ 44,738,618
Annual m3 Savings (2014)					
	Residential	838,806	44,433,623	5,203,928	32,434,937
	Low Income	-	7,443,613	837,362	1,433,803
	C&I	1,776,524	29,231,704	5,541,184	49,782,447
	Total	2,615,330	81,108,941	11,582,474	83,651,187
Lifetime m3 Savings (2014)					
	Total	45,196,622	1,084,138,194	168,723,475	n.a.

b) Mr. Neme does not have access to detailed information regarding the characteristics of large customers in these jurisdictions. As noted in response to a) above, large customers in Minnesota are permitted to opt out of DSM programs. To his knowledge, the utilities in Vermont, Massachusetts and Rhode Island serve all customers, including large customers, with their programs.

Witness: Chris Neme

GEC Response to Union Gas Interrogatory #2

Question:

Reference: L.GEC.1, Pages 24-25

Preamble: At section V.3, Mr. Neme notes that "a commercial cooling equipment upstream incentive program (blue bars) run by Pacific Gas and Electric in California for over a decade achieved nine times the level of participation that its former "downstream" customer rebate program design (red bars) achieved."

Question:

Union would like to better understand the information provided in Figure 3. Please provide further information and all relevant documentation regarding the following aspects of PG&E's program:

a) Program design
   i. List of the energy efficient equipment incented
   ii. Incentives provided for the upstream and downstream models for each year identified in Figure 3
   iii. Incremental costs of the equipment incented
b) Program delivery
   i. Who was the targeted upstream market actor for each year the upstream incentive model was used?
   ii. Were there any changes to marketing strategies/tactics when PG&E switched from a downstream approach to an upstream strategy and vice versa? If so, please discuss the changes.
c) Program evaluation
   i. Evaluation plans on this program
   ii. Net-to-Gross assessments (approach and results) for this program

d) Please clarify what is meant by "Tons of HVAC Equipment"

Response:

a) Program design
   i) PG&E and the other California IOUs that offer upstream HVAC incentives are continually updating the list of equipment for which upstream incentives are offered to reflect current market opportunities and developments. In its 2013-2014 Energy Efficiency Portfolio Program Implementation Plan, PG&E indicated that incentives would be available for at least the following equipment: [2]

[2] Pacific Gas and Electric Company 2013-2014 Energy Efficiency Portfolio Program Implementation Plan, Statewide Program, Commercial Program, PGE2101, April 23, 2013. (REVISED) p.146. http://eestats.cpuc.ca.gov/EEGA2010Files/PGE/PIP/2013/Clean/13-14_PGE2101_Commercial_PIP_5-29-13-CLEAN.pdf

- Air-cooled packaged and split systems <5.4 tons of cooling capacity
- Air-cooled packaged and split systems >=5.4 tons of cooling capacity
- Water or Evaporative cooled systems <5.4 tons of cooling capacity
- Water or Evaporative cooled systems >=5.4 tons of cooling capacity
- Air cooled chiller equipment
- Water cooled chiller equipment
- Variable refrigerant equipment

ii) Mr. Neme does not have access to the specific incentive levels offered for the years in question. However, Mr. James Hanna, former PG&E staff member and now Technical Director of Energy Solutions, the firm that is providing technical support to PG&E on its upstream programs, indicated that the incentives that were paid to the distributors in the upstream model were identical to the incentives that had been previously paid to the end use customers in the downstream model.[3] Current incentive levels, and a variety of additional information regarding participation in the upstream programs, are available to participating distributors for a variety of upstream programs at www.cainstantrebates.com. The information is available on password-protected sections of the website that are only accessible once a participation agreement has been executed by the distributor.

iii) Mr. Neme does not have access to data on the incremental cost of the equipment in question.

b) Program delivery

i) From PG&E's 2013-2014 Program Implementation Plan, "This sub-program element offers incentives to upstream market actors who sell qualifying high efficiency HVAC equipment."[4] It is Mr. Neme's understanding that the upstream incentives were, and are available to the entire market of eligible HVAC distributors.

ii) Mr. Neme does not have access to specific information regarding any changes in marketing strategies that accompanied the shift to upstream incentives, however in its 2013-2014 Program Implementation Plan, PG&E states that "The primary outreach vehicle between the Upstream sub-program element and program participants is via the website: www.cainstantrebates.com and other electronic communication (e.g., e-mail and newsletters…Additional marketing and outreach activities exist through personal contact between the program staff and program participants."[5]

[3] Personal communication between Jim Hanna (Energy Solutions) and Jim Grevatt (Energy Futures Group), who was collecting this information under my direction, July 2015.
[4] Pacific Gas and Electric Company. p.143
[5] ibid. p. 154

c) Program evaluation
   i) The current evaluation plans for the upstream HVAC program can be found in pages 105-120 of the 2013-2014 Energy Division-Investor Owned Utility Energy Efficiency Evaluation, Measurement and Verification Plan.[6]
   ii) Mr. Neme does not have net-to-gross data for this program.

d) "Tons of HVAC equipment" refers to the cumulative capacity, in tons, of the equipment that receives incentives through the program.

[6] 2013-2014 Energy Division-Investor Owned Utility Energy Efficiency Evaluation, Measurement and Verification Plan Version 4, California Public Utilities Commission, Energy Division, San Francisco, California. November 14, 2014. Available for download at http://www.energydataweb.com/cpuc/home.aspx#.

GEC Response to Union Gas Interrogatory #3

Question:

Reference: L.GEC.1, Page 25

Preamble: At section V.3, Mr. Neme notes that "Very similar results have been achieved in California for commercial gas boilers and other products. Similarly, in September 2013 Efficiency Vermont launched an upstream incentive for high efficiency circulator pumps for boilers and saw the market share (from one of the leading HVAC wholesalers) for those products increase from 2% or less to about 50% in the span of just one year."

Question: Union would like to better understand the programs offered by California and Vermont as they pertain to the information above. Please provide further information including documentation and/or relevant correspondence regarding:

a) Program design
    i. List of the equipment incented
    ii. Upstream incentive amounts
    iii. Percent of the incremental costs covered by the upstream incentives for each measure
b) Program delivery
    i. Who was the targeted upstream market actor for each offering where the upstream incentive model was used?
    ii. Were there any changes to marketing strategies/tactics when the noted jurisdictions switched from a downstream approach to an upstream strategy? If so, please discuss the changes.
c) Program evaluation
    i. Evaluation plans on these programs
    ii. Net-to-Gross assessments (approach and results) for this program
d) What are the "other products" incented in California?
e) For the leading HVAC wholesaler in Vermont how many units were sold before and after the upstream incentive model was introduced (2% vs. 50% market share)?
f) What is the annual market share for the technology identified in Vermont for years 2012-2014?

Response:

a) Program design
    i) Regarding high efficiency circulator pumps, Mr. Neme does not have a list of the specific equipment for which incentives were provided in Vermont. California has a several upstream programs in different market areas, covering different products. An indication of the range of products covered is provided by the following statement on the www.cainstantrebates.com website:

> *To date, the system has served California and Nevada power and gas utilities in support of Commercial HVAC, Residential HVAC, Motor, Water Heater,*

and Lighting & Electrical Distributors, as well as incentive programs for Bottling Companies and contractor installed LED Refrigerated Case Lighting and LED Signs.

ii) To provide an illustration, Mr. Neme's staff contacted PG&E, which provided the following table regarding the upstream gas water heater program:[7]

Water Heater Type	Input Rating	Required Efficiency	Incentive ($/Input Mbtuh)
Storage Water Heaters	> 75 Mbtuh	Thermal efficiency ≥ 0.90	$3.00
Tankless Water Heaters	<= 200 Mbtuh	Thermal Efficiency ≥ 0.90	$3.00
	> 200 Mbtuh	Thermal Efficiency ≥ 0.84	$1.00
	> 200 Mbtuh	Thermal Efficiency ≥ 0.90	$3.00

iii) Mr. Neme does not have the specific percent of incremental costs that upstream incentive amounts are intended to offset. However, as noted in his testimony, incremental costs at the distributor level can be substantially lower than incremental costs at the retail level. The result – that the same incentive covers a higher fraction of incremental cost at the distributor level – is one of the attractive features of upstream incentive models.

b) Program delivery
   i) As for 2.b.i., incentives are targeted to distributors who sell product to the contractors who ultimately sell to and install the product for end-users.
   ii) Mr. Neme does not have access to specific information regarding any changes in marketing strategies that accompanied the shift to upstream incentives in these examples.

c) Program evaluation
   i) Mr. Neme is not aware of the evaluation plans for these programs.
   ii) Mr. Neme does not have net-to-gross data for the Vermont program. California has a several upstream programs in different market areas, covering different products. To provide an illustration, Mr. Neme's colleague contacted PG&E, which informed him that the net-to-gross value for the gas water heater program is 0.60 regardless of whether the savings are captured through upstream or downstream approaches.[8]

[7] Personal communication between Jim Grevatt (Energy Futures Group) and Andy Doeschot, August 7, 2015.
[8] Personal communication between Jim Grevatt (Energy Futures Group) and Andy Doeschot, August 7, 2015.

d) In addition to the products listed in 2.a.i, it is Mr. Neme's understanding that California IOU's currently provide upstream incentives for residential HVAC equipment, LED refrigerated case luminaires, gas-fired water heaters, LED replacement lamps, and refrigeration/ice-making equipment used by bottling/vending companies.[9]

e) Mr. Neme does not have access to these proprietary sales data.

f) Mr. Neme does not have access to these proprietary sales data.

[9] www.cainstantrebates.com lists these product areas as having current upstream incentives available.

GEC Response to Union Gas Interrogatory #4

Question:

Reference: L.GEC.1, Page 26

Preamble: At section V.3, Mr. Neme notes that "In contrast Commonwealth Edison's current small business direct install program in Illinois is expecting to serve 5% its eligible customers this year and forecast to serve over 6% next year."

Question: Please provide the following details regarding Commonwealth Edison's Direct Install program:

a) What is the offering to the small business customer?
b) What measures are offered in the direct install program?
c) What are the incentives for each measure?
d) Percent of incremental cost and full cost covered by the incentive
e) Definition of a "small business" customer

Response:

a) See attached ComEd program description.
b) There are a range of electric efficiency measures, including lighting, refrigeration and HVAC measures. ComEd used to jointly deliver the program with the gas utilities in its service territory, so there also used to be gas measures included. However, because the electric portion of the program is not budget constrained (whereas the gas utility contributions to it were) and the demand has grown substantially, the program is no longer jointly delivered.
c) Mr. Neme does not have that information and does not believe that it is publicly available.
d) Incentives are generally designed to cover approximately 75% of incremental measure costs.[10]
e) For the purpose of this program, small business is defined as a customer with peak electric demand less than 100 kW.

[10] Personal communication with Edward Musz (ComEd), August 6, 2015.

Program Name	**Small Business Energy Services (SBES)**
Program Description	Provide small business customers with cost-effective turn-key energy efficiency retrofit services. Generating energy savings by direct installation of low-cost energy efficient products and also providing incentives for more capital-intensive measures to maximize energy efficiency opportunities.
Program Duration	June 2014 through May 2017, 3-year program
Collaboration	Program will be jointly delivered with the local gas companies People's Gas, North Shore Gas and Nicor Gas.
Delivery Strategy	SBES will be promoted through multiple channels including trade allies, program outreach staff, and key partners. Trade allies will be the primary means of promoting SBES and obtaining participants. ComEd will support the trade allies by providing formal marketing/outreach guidance and co-branded promotional materials. The trade allies role will expand to conduct and collect all of the customer information. They will also complete the direct installs selected by the customer and arrange to install the retrofit measures that the customer would like to complete. Furthermore, trade allies will be given extensive marketing support, which will make sure that they have the needed materials and messaging needed to advertise the program. Additionally trade ally support will include establishing, maintaining, and leveraging relationships with local business groups, media, and government organizations to promote program awareness and drive participation. Joint outreach and marketing initiatives conducted with key partners will be part of a cost-effective means of reaching large numbers of potential SBES participants. These partnerships include ComEd External Affairs Managers (EAMs), Chambers of Commerce, small business organizations, and other ComEd Smart Ideas implementing contractors. Lastly, the SBES Geo-Targeted program will be offered to select towns to assist with Energy Efficiency awareness and program recruitment. This effort will be based upon the model established and vetted with Pilot I and Pilot II implemented by ComEd in 2013. The selected towns will be engaged through local media, local governments, and other local community organizations; all SBES eligible customers will receive emails and postcards. SBES trade allies will conduct in-person outreach to answer customer questions and conduct energy assessments.
Target Market	This program is designed for small business customers. All targeted customers taking delivery service from ComEd are eligible for the program regardless of their choice of supplier.
Marketing Strategy	The marketing strategies includes the following: • Supplement the direct-install efforts of the implementation contractor by developing trade ally relationships in local communities that can deliver education, training and EE technologies to small C&I customers • Promote free subscription to Energy Insights Online to cultivate energy usage understanding and energy efficiency mentality • Educate and leverage existing resources (e.g., trade allies, ComEd external affairs managers, call center) to their greatest potential to achieve broad-based awareness at the lowest possible cost Materials and tactics for trade ally marketing would include program materials and marketing collateral, sale tools, outreach, and training. Materials and tactics for marketing to customers would include direct mail, telemarketing, outreach events, newsletters, bill insets, and printed collateral. **Key Messages**: • Simple, easy and FREE energy efficiency measures are available to your business through ComEd's Smart Ideas Small Business Energy Services incentive • These Energy Efficiency technologies can help you lower your energy bill

Program Name	Small Business Energy Services (SBES)

Program Targets

Participation Levels

	PY7	PY8	PY9	Total
Total Sites	16,000	16,000	16,000	48,000

Annual Savings Targets

	PY7	PY8	PY9	Total
Gross MWh	105,263	140,000	175,789	421,052
Net MWh	100,000	133,000	167,000	400,000
Gross MW	29.7	39.6	49.7	119.0
Net MW	28.3	37.6	47.2	113.1

Program Budget

	PY7	PY8	PY9	Total
Administration	**$174,761**	**$180,004**	**$185,404**	**$540,169**
Implementation	**$20,994,187**	**$29,049,773**	**$37,350,404**	**$87,394,364**
Incentives	**$4,041,618**	**$4,122,450**	**$4,204,899**	**$12,368,967**
Marketing and Other	**$2,332,687**	**$3,227,753**	**$4,150,045**	**$9,710,485**
Total	**$27,543,253**	**$36,579,980**	**$45,890,752**	**$110,013,985**

Cost-Effectiveness Results

	Test Results
TRC	**2.32**
UCT	**3.58**
CCE	**$0.025**

GEC Response to Union Gas Interrogatory #5

Question:

Reference: L.GEC.1, Pages 41-42

Preamble: At section IX.2, Mr. Neme notes, "My experience with assessing the role that geographically-targeted DSM could play in cost-effectively deferring infrastructure investments – and I have studied every major example of such electric utility efforts over the past two decades, conducted trainings for system planners on how to integrate consideration of DSM into system planning, and am currently working on a pilot project with a Michigan utility – suggests that the key piece of new information most gas utilities would need to assess the potential role of efficiency in deferring infrastructure investments are hourly peak day load shapes (and/or an estimate of the relationship between peak hour savings and annual savings) for each potential efficiency measure. That is a question that could and should be addressed generically and immediately."

Question: Union would like to better understand the referenced pilot project in Michigan.

a) Is the pilot project for a natural gas utility?
b) If the answer to part a) is yes, please provide those documents related to the pilot project which address the relationship between hourly peak day load shape and the potential role of efficiency in deferring infrastructure investments.

Response:

a) & b) No, it is for an electric utility.

Witness: Chris Neme