

August 26, 2015

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

RE: EB-2015-0029 – Union Gas Limited (“Union”) – 2015-2020 DSM Plan - Undertaking Responses

Dear Ms. Walli,

Please find attached Union’s responses to the following undertakings received in the above case: J1.1; J3.2; J3.8; J3.9; J3.11; J3.14; J4.3; J4.4; J4.5; J4.6 and J4.8.

If you have any questions with respect to this submission please contact me at 519-436-5334.

Yours truly,

[original signed by]

Vanessa Innis
Manager, Regulatory Initiatives

Encl.

cc: Lawrie Gluck, Board Staff
Alex Smith, Torys
All Intervenors (EB-2015-0029)

UNION GAS LIMITED

Undertaking of Mr. Sloan
To Mr. Poch

To take the values in the 1997 ICF study for avoidance of what we'll call local transmission, express it in 2015 dollars, and express those values as a percent of Union's commodity avoided costs.

Union notes the caveats that Mr. Sloan discussed when asked about the 1997 EEA study during the Technical Conference (July 7, 2015 Transcript, pp. 52-53):

"MR. SLOAN: The reference to the 1997 study was actually a reference to an ICF or rather an EEA study authored by Dr. Michael Lerner and myself, and so I'm somewhat familiar with those numbers and that study, although it is 18 years old or so at this time.

In that study, the capacity breakdown included the pipeline capacity costs outside of the franchise, so upstream of the service territory, as well as the infrastructure inside of the service territory.

And in the current Union Gas avoided cost structure, of course, those upstream pipeline capacity costs are not included in the facilities component of the avoided cost, that 2 percent.

So the largest component of the capacity costs from that old study are already accounted for in the energy cost analysis of the Union Gas study and not -- would not be appropriately included in the T&D cost component."

In addition, Union notes that Ms. Lynch reiterated it is Union's intention to study the appropriate costs to include in its avoided costs within Union's DSM and infrastructure planning study.

In response to the undertaking request please see the table below, which expresses the values in the 1997 EEA study in 2015 dollars using a GDP IPI FDD inflation factor. Union has not calculated these values as a percent of Union's 2015 commodity avoided costs, as the avoided costs provided below are expressed in $\$/\text{m}^3/\text{design day}$ and the commodity avoided costs are expressed in $\$/\text{m}^3$. These numbers are not directly comparable.

Value in Study ($\$/\text{m}^3/\text{design day}$) (a)	Calculated Value ($\$/\text{m}^3/\text{design day}$) (b)
\$ 4.34	\$ 6.26
\$ 0.58	\$ 0.84
\$20.69	\$29.86

UNION GAS LIMITED

Undertaking of Mr. Goulden
To Mr. Shepherd

To provide the total number of low-income projects in 2013.

Response:

In 2013, Union had a total of 25 low income custom projects, with 11 being included in the sample for verification.

UNION GAS LIMITED

Undertaking of Ms. Brooks

To Mr. Shepherd

To provide a technical response re: air sealing.

Response:

Air sealing is measured as the improvement in the air change rate (i.e. air changes per hour) of the home as assessed by the blower door tests completed in the pre and post energy assessment. The blower door test measures the air tightness of the home. The numbers from the pre-assessment blower door test are an input into the NRCan Hot2000 software to establish the base case and target improvement in air change rate required to qualify for the air sealing measure in the Home Reno Rebate program offering. Union offers rebates for achieving the target reduction for air sealing of 10% below the base case, as well as the target + 10% (20% reduction).

As a component of the pre-assessment the energy auditor does a walk-through of the home with the client to show them the identified places that showed air leakage during the test. Examples of the types of improvements that can be completed to improve the air tightness of the home include:

- Spray foam or vapour barrier in basements of headers/where the wood-frame wall meets the masonry foundation and where joists penetrate the masonry wall
- Sealing around window and door frames, pipes and ductwork as well as installing air sealing material behind wall outlet plate covers
- Addressing holes and gaps where electric or gas services penetrate through the wall
- Foundation crack injection in the foundation wall
- Sealing gaps around attic access doors

UNION GAS LIMITED

Undertaking of Ms. Brooks
To Mr. Shepherd

To provide a chart of what measures are being implemented in the home reno rebate program and what are forecast to be implemented going forward.

Response:

Please see Attachment 1 for the measures implemented in 2014.

Union did not conduct a measure-level forecast for the 2016 Home Reno Rebate offering. However, the natural gas savings forecast is based on the historic average savings per home which implicitly assumes a go-forward mix of measures that is consistent with past experience. An additional assumption that 10% of participants would implement an incremental measure was added to the historical average due to the influence of the bonus rebate and/or the increased maximum rebate. The savings for the incremental measure were based on the average savings per home divided by the average number of measures implemented per home.

File #	Deep Measures						
	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
1194E00913	X			X			
1194E00915		X		X			X
11R1D00773		X		X			
1194E00911	X	X		X			X
1194E00910		X	X	X		X	
1194E00914	X	X	X	X			
11R1E00772	X			X		X	X
1151D00774		X				X	
1190E49989		X		X			
1190E01339		X				X	
1190E01335						X	X
1190E01331				X			X
5e76e00232		X		X		X	X
5e76e00229		X	X	X			X
5e76e00230		X				X	X
5e76e00231		X		X			X
5E76E00236	X	X		X		X	X
7M04E00372	X		X	X		X	
7M04E00381	X	X		X			
22L9E01083		X		X			
22L9E01084	X			X			X
7M04E00375	X	X	X	X		X	
7M04E00380	X	X		X			
4L01E00433						X	X
1190E01342	X		X	X			
4S21E03655				X			X
4S21E03649						X	X
4S21E03651				X	X		X
4S21E03656				X		X	X
4S21E03657					X		X
4S21E03658	X						X
4S21E03659	X			X			X
4S21E03652	X	X	X	X			
4S21E03662	X			X			
4S21E03653				X		X	X
22L9E01059				X	X		X
22L9E01038	X	X		X		X	
22L9E01082	X			X			X
4X81E00049			X	X			
4X81D00034	X		X	X		X	X
4X81E00059			X	X			X
4X81E00040		X	X	X		X	
4X81E00057				X			X
4X81E00056		X	X	X			X
4X81E00046		X		X		X	
4X81E00060				X			X
4X81E00061				X			X
4X81E00055	X	X		X			
4X81E00058				X			X
1190E01333	X					X	X
1190E01330				X	X		X
1190E01343	X			X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
22L9E01088				X			X
4S21E03654				X		X	X
4S21E80017	X			X		X	
22L9E01112				X			X
22L9E01095				X			X
7M04E00376	X	X		X	X		
4X81E00047		X		X		X	
22L9E01102				X			X
22L9E01096	X			X			X
22L9E01093				X			X
22L9E01079	X		X	X			
22L9E01103				X			X
22L9E01109				X			X
14K3e02258	X	X		X		X	
14K3e02255	X						X
14K3e02252	X	X	X	X		X	X
14K3e02253	X			X	X	X	
4L01E90044	X		X			X	
7M04E00385	X	X		X			
22L9E01124				X			X
22L9E01123				X			X
22L9E01094				X			X
22L9E01125				X			X
22L9E01117		X		X			
22L9E01129				X			X
22L9E01090				X			X
22L9D01136				X			X
22L9E01146				X			X
22L9E01132		X	X	X			
22L9E01087		X		X			
22L9E01154				X			X
1190E02259			X	X		X	
22L9E01107				X			X
22L9E01151				X			X
22L9E01150				X			X
22L9E01144				X			X
22L9E01160				X			X
22L9E01156				X			X
22L9E01098	X		X	X			
22L9E01060				X		X	
22L9E01099	X		X	X			
22L9E01072				X		X	
4X81E00066				X			X
4X81E00069				X			X
22L9E01116		X		X		X	
22L9D01164				X			X
7M04E00389	X		X	X			
4S21E03666				X	X		X
5EF7E00468		X	X	X			
5EF7E00470	X		X	X			
4X81E00048	X	X	X	X		X	
4X81E00067	X	X	X	X			
22L9E01155				X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
22L9E01174				X			X
22L9E01178	X	X		X			X
22L9E01167				X			X
22L9E01131	X	X	X	X			
22L9E01148		X		X		X	
22L9E01089	X		X	X			
22L9E01122		X		X		X	
2277E01470	X	X	X	X			
2277D01471		X		X			
2277D01479	X	X		X			
2277E01478	X	X		X		X	
2277E01474	X	X		X			
2277E01477		X		X			
22L9E01120				X			X
22L9D01119				X			X
1190D01327	X	X	X	X		X	
22L9E01173	X	X	X	X			
5E27E00999				X	X		X
5E76E00238		X		X			
4S21E03664				X	X		X
7M04E00391	X	X	X	X		X	
22L9E01126	X		X	X			
22L9E01086				X		X	X
22L9E01104	X		X	X			
22L9E01163	X	X	X	X			
22L9E01108		X	X	X			
2277E01502				X			X
22K6D2013102747	X		X				
4X56E00785				X	X		X
22J0E00001	X	X	X				
5E76E00244				X			X
5E76E00253				X			X
5E76E00252				X			X
5E76E00251				X			X
5e76e00241				X			X
22L9E01179				X			X
22L9E01105				X			X
22LK9E01158				X			X
22L9E01138	X		X	X		X	
22L9E01168				X			X
22L9E01191				X			X
22L9E01196+				X			X
22L9E01170	X		X	X			
1194E00916			X	X		X	
1151E01004	X	X		X		X	
7M04E00383	X		X	X		X	
22L9E01212				X			X
22L9E01199				X			X
22L9E01073			X	X		X	
22L9E01190				X			X
22L9E01230				X			X
22L9E01222	X		X	X			
22L9E01181			X	X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
22L9E01129		X		X		X	X
1190E48360	X		X	X			
1190E41126	X		X	X		X	
1190E40197		X				X	
4M78D02001	X			X			X
22L9E01204				X			X
22L9E01218			X	X			
22L9E01210				X			X
2277E01481	X		X				
4X81E00074		X		X			
4X81E00063				X		X	X
22L9E01113		X		X			X
22L9E01236	X		X	X			
22L9E01241	X	X		X			
22L9E01217				X			X
22L9E01250				X			X
22L9E01237				X			X
22L9E01216				X			X
22L9E01187				X			X
22L9E01244				X			X
22L9E01194				X			X
22L9E01239				X			X
22L9E01209	X		X	X			
22L9E01165				X		X	X
22L9E01219	X		X	X			
22L9E01211	X		X	X			
22L9E01198				X			X
22J3e01704	X		X	X			
4X81D0077			X	X			
4X81E00071	X		X	X			
5EH2E00004				X			X
5e76e00252				X			X
5e76e00247	X		X	X		X	X
7M04E00382	X			X		X	
22L9E01214		X		X			
22L9E01145				X			X
22L9E01240	X		X	X			
22L9E01192	X	X	X	X			
7M04E00401						X	X
22L9E01161	X			X			
22L9E01135			X	X			
22L9E01273				X			X
4M41E02002	X		X	X			
2277E01492	X		X	X		X	
22L9E01147				X		X	X
22L9E01270				X			X
22L9E01259				X			X
2277E01488	X		X	X			
7U07E00102		X			X		X
22J0E00002	X	X		X		X	
4M78E02001	X			X	X	X	X
22L9E01091	X	X	X	X			X
22L9E01278				X			X
22L9E01252				X			X
22L9E01238	X	X	X	X			

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
7M04E00407	X	X	X	X		X	
11H2E00474	X	X		X		X	X
22L9E01121	X			X		X	
22L9E01101	X	X		X		X	X
22L9E01081	X	X		X		X	
22L9E01225				X			X
7U20E00001			X	X			
22L9E01280	X		X	X			
22L9E01092	X	X		X			
22L9E01281				X			X
4M41E02003		X		X			X
22L9E01297				X			X
22L9E01296				X			X
22L9E01183				X			X
22L9E01255				X			X
2277E01484	X	X	X	X			
5E76E00234	X					X	X
7M13E00006	X	X		X			
5E76E00255				X			X
5e76e00242				X			X
1190E01368		X	X	X			
22L9E01263				X			X
22L9E01197			X	X			
7M04E00384	X	X		X		X	
4M41E02013	X		X				
4M78E02004	X			X			X
2277E01487		X		X			
2277E01504	X	X		X		X	
22H8E90001		X		X		X	
2277E01495	X		X	X			
22J0E00003	X		X	X		X	X
4M41E02001		X	X	X			X
7M04E00410		X		X		X	
7M04E00397	X		X	X			
22L9E01268				X			X
22L9E01279				X			X
22L9E01166				X			X
22L9E01291				X			X
22L9E01264				X			X
22L9E01294				X			X
22L9E01293				X			X
22L9E01229				X			X
22L9E01133	X	X		X		X	
22L9E01226	X			X		X	
22L9E01283				X			X
22L9E01306				X			X
22L9E01251			X	X			
22L9E01128		X		X		X	X
22L9E01118				X			X
7M04E00386	X		X			X	
7M04E00387	X		X			X	

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
7M04E00388	X		X	X			X
22L9E01111				X			X
22L9E01246				X			X
22L9E01247	X		X	X			
22L9E01286				X			X
22L9E01303				X			X
2277E01475	X	X	X	X			
4M41E02010		X	X	X		X	
1190E01355		X		X		X	
7M04E00412	X		X	X			
7M04E00413	X		X	X			
22L9E01175				X			X
22L9E01110	X		X	X		X	
22L9E01114				X		X	X
22L9E01115				X			X
22L9E01100	X			X			
2277E01494	X		X	X			
5E27E01013	X	X		X		X	
5E27E01008	X			X		X	
5EF7E00471			X	X			
22L9E01311				X			X
22L9E01267	X			X			X
22L9E01295				X			X
22L9E01254	X		X	X			
22L9E014130				X			X
22L9E01233			X	X			
7U23E00002			X	X		X	
2277E01507		X	X				
22L9E01149	X			X			
22L96E01224	X		X	X		X	
22L9E01320				X			X
2277E01472		X		X		X	X
4X56E00777				X		X	X
1190E01354						X	X
4S21E03668					X		X
4S21E03669	X					X	X
4S21E03672	X			X		X	X
7U23E00001	X	X					
7U20E00002	X		X	X			
22L9E01137				X			X
22L9E01253				X			X
22L9E01298	X	X	X	X		X	
2277E01480	X	X		X		X	
22J3e01829			X	X			
2277E01486		X	X	X		X	
2277E01476	X		X	X			
2277E01499		X					X
7M04E00392		X		X		X	
22L9E01292				X			X
22L9E01232	X			X		X	
22L9E01139				X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
22L9E01290	X	X		X			
22L9E01134	X			X		X	X
22J0E00004	X	X	X	X		X	
4M41E02017		X	X				
22J3E01835	X		X	X			
4M01D02003	X		X	X			
22L9E01331				X			X
22L9E01332				X			X
4M01D02002			X	X			
7M04E00408		X		X		X	
2277E01516	X					X	X
2277E01503	X			X			
2277E01511	X	X	X	X			
2277E01526	X			X			
2277E01491		X	X			X	X
22L9E01352				X			X
22L9E01340				X			X
22L9E01262				X			X
22L9E01231				X			X
22L9E01206	X		X	X			
22L9E01169		X		X			
1190E01376		X		X		X	X
228HE90002	X	X		X			
22L98E01195	X			X		X	X
22L9E01333				X			X
22L9E01317	X		X	X			
22L9E01309	X		X	X			
22L9E01289	X	X		X			
22L9E01310	X		X	X			
22L9E01249				X			X
2277E01524	X	X	X	X			
5E58E01204	X	X	X	X		X	
5E58E01203				X			X
22L9E01162	X			X			
22L9E01341				X			X
22L9E01157				X			X
22L9E01337	X		X	X			
22L9E01355				X			X
22L9E01215	X	X		X			
22L9E01258				X			X
22L9E01287				X			X
22L9E01324				X			X
22L9E01328				X			X
4M41E02022	X		X	X			
4M41E02004				X			X
4XA2E00007		X		X			
4XA2E00005		X		X			
7U26E0002	X	X	X				
4S21E80020				X		X	X
4S21E80021	X						X
4S21E03684	X			X			X
4S21E03665	X		X	X		X	
22L9E01336				X			X
22L9E01343	X		X	X			
22L9E01364				X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
22L9E01213				X			X
4M41E02020	X		X	X			
22L9E01182				X			X
22L9E01208	X		X	X			
22L9E01301		X		X			X
22L9E01302	X			X	X		X
22L9E01365				X			X
1194E00917		X		X		X	
2277E01490	X	X		X			
4M41E02018	X	X		X			
2277E01505	X		X	X			
22J3e01836	X		X	X			
22L9E01346				X			X
2277E01489		X				X	X
2277E01482	X	X	X			X	
2277E01518		X		X		X	
2277E01493				X			X
22J3e01828				X		X	X
22J3e01832		X		X	X		X
22L9E01142				X	X		X
22L9E01176				X			X
22L9E01329				X			X
1190E01373						X	X
22L9E01335				X			X
22L9E01338	X			X			
2277E01485		X	X	X			
22J3e01827		X		X			X
22J3e01831		X		X			X
22J3e01826		X		X		X	
22L9E01243				X			X
7M04E00395	X	X		X			
7M04E00419	X	X		X		X	
1190E01363			X		X	X	X
22L9E01299				X			X
4S21E03676		X		X		X	X
4S21E03671	X			X			X
22J3e01833			X	X		X	X
2277E01512	X		X	X			
4XA2E00002			X	X			
2277E01496	X		X	X			
22L9E01313	X	X		X		X	X
4M41E02008	X	X	X	X		X	
4M41E02009	X		X	X		X	
22L9E01370				X			X
22L9E01308	X	X	X	X			
22L9E01305			X	X		X	
5E87E00554	X		X				
5e76e00240		X		X			
5E87E00551	X	X	X	X			X
5e76e00257				X			X
5e76e00248				X	X		X
5e76e00245	X			X			X
5e76e00246	X			X			X
5e76e00256				X		X	X
22J3e01842		X		X			

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
2277E01522	X		X	X			
2277E01517	X	X		X		X	
2277E01497			X	X			
22J3e01838		X		X		X	
2277E01498				X			X
7M04E00396	X		X				
22L9E01172				X			X
22L9E01207	X	X		X			X
22L9E01248				X		X	
22L9E01307	X	X	X	X			
22L9E01360				X			X
22L9E01330				X			X
22L9E01223				X			X
4M41E02006	X	X		X			
22L9E01378				X			X
22L9E01275			X	X			X
22L9E01383				X			X
22L9E01345				X			X
22L9E01312				X			X
22L9E01377				X			X
4M01E02001	X			X			X
22J3e01839	X			X			X
22J3d01840	X		X	X			
22J3e01841	X	X		X			X
22J3e01852	X		X				
22J3e01844	X		X	X			
2277E01508				X	X		X
22J3d01845		X		X			X
22J3e01851	X	X	X	X			
2277E01525		X		X		X	
1190E01385					X		X
1190E01357		X		X		X	
1190E01358		X		X		X	
1190E01361					X		X
22L9E01384				X			X
22L9E01334				X			X
22L9E01177				X			X
22L9E01282	X	X	X	X			
22L9E01366				X			X
11H2E00479	X	X				X	
7U07E00101				X		X	X
22L9E01171				X			X
22L9E01143				X			X
22L9E01140				X			X
2277E01501	X	X		X			
2277E01510	X		X	X			
4M23E02001	X		X	X			
5E27E00998					X		X
5E27E01012				X	X		X
5E27E01050		X		X			
22L9E01358	X	X		X			
22L9E01376				X			X
22L9E01390				X			X
4S21E03694	X		X	X			X
4M41E02005	X	X		X		X	X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
7M04E00393	X	X		X			
22L9E01193	X		X	X			
22L9E01202	X	X	X	X			
4XA1E00001		X		X			X
4XA1E00004	X	X		X			
22J3e01835	X	X		X			
22L9E01186	X			X			X
1190E01372		X					X
22L9E01189				X			X
7M04E00398		X		X		X	
7M04E00415		X		X		X	
7M04E00422	X	X	X	X		X	
7U26E0001		X	X				
22L9E01393				X	X		X
22L9E01277				X			X
22L9E01257				X			X
4S21E03686						X	X
4S21E03674	X	X					
4S21E03681			X	X		X	
4S21E03670		X		X			X
4S21E03699	X		X	X			
1190E01369	X		X			X	
1194E00921		X		X		X	
1194E00918		X	X			X	
1194D00926		X		X		X	
1194E00925		X		X		X	X
1194E00930						X	X
4X81D00068	X	X		X		X	
1194E00922		X			X	X	
5E27E00998				X			X
22L9E01397				X			X
22L9E01266	X			X			
22L9E01396				X			X
22L9E01363				X			X
7M04E00406	X	X		X		X	
7M04E00400			X	X		X	
4M78E02003	X			X		X	X
22L9E01367				X			X
22L9E01221	X		X	X		X	X
22J3E01837		X	X	X			
2277E01500	X					X	
22L9E01205	X			X		X	
4M41E02027	X		X				
22L9E01359	X			X			
22L9E01188				X			X
22L9E01361				X			X
22L9E01402				X			X
22L9E01256	X			X	X	X	X
4M01E02006	X		X	X		X	
4M67E02001	X			X	X	X	X
4M41E02011	X		X				
7M13E00004	X		X				
7M04E00399	X	X		X		X	
5e76e00237		X		X			
5e76e00228	X	X		X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
5e76e00249	X			X		X	
5e76e00239	X	X		X		X	
5e76e00243		X		X		X	X
7M04E00424	X		X	X			
22L9E01185	X			X			X
22L9E01272			X	X		X	
4m01E02005	X	X		X			
22L9E01354			X	X		X	
22L9E01411				X			X
22L9E01404				X			X
22L9E01416				X			X
22L9E01406				X	X		X
22L9E01389	X	X	X	X			
22L9E01274		X		X			X
22L9E01201				X			X
2277E01551	X	X	X	X			
4S21E03701				X	X	X	X
4X81E00076	X	X	X	X			
4X56E00790				X		X	X
4M41E02031	X	X		X			
4M41E02029	X		X				
4X56E00776			X	X			X
4M41E02032	X		X				
7U23E00003			X	X			
5e76e00233	X	X		X	X	X	
7U23E00004		X				X	
4M01E02004			X	X			
4M41E02019	X		X	X			
7U23E0009	X		X				
7U2300010	X		X	X			
22L9E01422				X			X
22L9E01407				X			X
22L9E01373				X			X
22L9E01227				X			X
22L9E01203	X		X	X			
22L9E01200	X		X	X			
7U07E00103	X		X	X			X
7U07E00105	X	X				X	X
22L9E01288	X		X	X			
4XA2E00008		X		X		X	
22J3e01849	X			X	X		X
2277E01535	X		X	X			
22L9E01418				X			X
1194E00931						X	X
4XA2E00013		X		X			

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
4S21E03667			X			X	
22L9E01356				X			X
7U23E00015	X		X				
4M41E02030	X			X			
1190E1380						X	X
2277E01534				X		X	X
22L9E01233				X			X
22L9E01327				X			X
22L9E01409				X			X
22L9E01184				X			X
4S21E03680	X			X		X	X
2277E01531	X	X	X	X			
11H2E00481		X		X		X	
11H2E00477		X		X			
22L9E01399				X			X
22L9E01420				X			X
4M41E02012		X		X		X	
4X81E00070	X	X		X			
2277E01519		X		X	X	X	X
5e76e00265				X	X		X
1151E01016						X	X
22J3e01848		X	X	X			
11H2E00478		X		X			
7M04E00405	X	X				X	
4S21E03691				X	X		X
2277E01563			X	X			
22J3e01843		X	X	X			
2277E01530	X			X	X	X	X
4S21E80019					X		X
22L9E01395				X			X
4M41E02007		X		X	X	X	X
2277E01509	X	X	X	X		X	X
22L9E01339				X			X
4S21E03675			X			X	
4XA2E00011		X	X	X		X	
22J3e01850			X	X		X	
2277E01513		X		X			X
22L9E01426				X			X
2277E01506	X	X	X	X	X	X	
22L9E01388				X			X
2277E01527	X	X		X			
22L9E01398	X			X			
22L9E01423				X			X
4S21E03673		X		X			X
2277E01533	X			X		X	
2277E01529	X	X		X			
22L9E01400				X			X
22L9E01285		X		X		X	
4S21E03685	X	X		X			X
2277E01515	X		X	X			
4S21E03679		X				X	X
7M04E00420	X	X					
7M04E00421	X	X					

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
7M04E00418	X		X	X		X	
7M04E00409	X	X		X			
7M13E00010	X	X		X		X	
5EH3E00004	X	X	X	X		X	X
4M41E02039	X			X		X	
5EH3E00003	X	X		X			
5E03E00974				X			X
4M41E02033	X		X	X			X
5e76e00258			X	X		X	
5E87E00552				X		X	X
5EG5E00031		X		X		X	
5EG5E00030		X		X		X	
5EH2E00003	X			X		X	X
5EH2E00008	X	X		X		X	
5EH2E00012				X			X
5EH2E00013					X		X
5EH2E00017				X			X
1194E00923		X		X		X	
5EH3E00001				X			X
1194E00924				X		X	X
5EH3E00002	X	X		X		X	X
4M41E02026	X		X	X			
11R1E00781					X		X
5EH2D00015		X		X			X
5E27E01016				X			X
5E27E01022		X					X
5E27E01032	X			X			
2277E01520	X			X			X
2277E01550	X	X	X	X		X	
14K3e02261	X	X		X			
2277E01548	X	X		X			
2277E01540		X		X		X	
11R1E00778		X		X			
4M41E02024	X	X		X			
7M13E00009	X	X	X				
7M13E00011			X			X	
7M04E00012		X		X		X	X
7M04E00411	X	X	X	X		X	
7M04E00414	X		X			X	
22L9E01220	X			X	X	X	X
22L9E01300	X		X	X		X	
22L9E01322				X			X
22L9E01347	X		X	X			X
22L9E01414				X		X	X
22L9E01349				X			X
11H2E00480		X		X			
4XA2E90002	X		X	X		X	
22L9E01325		X		X		X	
22J3e01853	X	X		X		X	
4XA2E00004	X	X	X	X		X	
22L9E01430				X	X		X
22L9E01319				X			X
22L9E01228	X		X	X			

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
22L9E01428				X			X
22J3e01846		X		X			X
22L9E01242				X		X	X
5EH2E00006				X			X
22L9E01245	X		X	X			
22L9E01415				X			X
22L9E01440				X			X
7U23E00005			X	X		X	
4XA2E00019		X		X			
22L9E01381				X			X
7U23E00013	X			X			
22J3e01861	X		X	X			
22J3e01869		X		X			
22J3e01866				X			X
4M41E02041				X			X
4M41E02037	X		X	X			
4M41E02015	X	X					
22L9E01439				X			X
22L9E01357				X			X
22L9E01323				X	X	X	X
22L9E01265	X			X			
22L9E01401				X			X
22L9E01442				X			X
22L9E01452				X			X
1190E01370	X	X	X	X		X	
2277E01552	X			X		X	
2277E01555		X		X			
2277E01559		X		X			
22L9E01427				X			X
22L9E01351		X	X	X			
22J3e01855		X		X			X
22J3e01863		X	X	X			
22L9E01445				X			X
22L9E01443				X			X
1190E1364					X	X	X
4X81D00072	X	X		X			
4M41E02043	X		X	X			
4M41E02040		X	X				
4M41E02016	X		X	X			
22L9E01284		X	X	X			
22L9E01326			X	X		X	
22L9E01449				X			X
22L9E011458				X			X
22J3e01856		X	X	X			
5EG5E00029	X			X			
2277E01521			X	X			X
2277E01523			X	X		X	
22L9E01435	X	X	X	X			
22L9E01456				X			X
5E03E00971			X	X		X	
2277E01544		X	X	X		X	
22L9E01424				X			X
22L9E01441				X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
4B41E00154	X			X			X
5E87E00553				X	X		X
5e76e00269				X			X
5e76e00268				X			X
22L9E01466				X			X
22L9E01454				X			X
22J3e01857			X	X			X
7M04E00417		X	X	X			
7U20E00005				X			X
22L9E01421	X		X	X			
22L9E01432				X			X
22L9E01448				X			X
22L9E01459				X			X
22L9E01461				X			X
4S21E03677		X	X		X		
4S21E03704	X			X			X
4M67E02006				X			X
2277e01543		X		X		X	
5e76e00259			X	X		X	
5EH2E00021	X	X		X			X
7M04E00423		X	X	X		X	X
2277e01566	X	X		X			
2277e01549		X	X				
22L9E01417	X		X	X		X	X
7M13E00008	X	X	X	X		X	
4L01E00437	X			X		X	
4L01E00437		X	X			X	X
22L9E01473				X			X
2277E01542	X		X	X			
2277E01570				X			X
2277E01528	X	X		X		X	
4XA2E90003	X	X	X	X		X	
22L9E01478				X			X
4S21E03683	X					X	X
4S21E03682				X		X	X
1190E01374		X	X			X	
4S21E03693	X		X			X	X
4S21E03703	X		X				
22L9E01479				X			X
2277E01557		X		X	X		X
2277E01532	X	X		X		X	X
2277E01565	X		X	X			
4M41E02045		X	X				
1190E01377				X			X
4XA2E00017	X		X	X			
4XA2E00009		X	X	X			
4XA2E00022		X		X			
4S21E03706		X		X		X	X
7U20E9001	X						X
22L9E01316	X	X	X	X			X
22L9E01394	X			X		X	
22L9E01431	X		X	X			
22L9E01438				X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
11R1E00777		X		X			
2277E01569	X			X			
22L9E01391	X	X		X	X		X
22L9E01429				X			X
22LE01437				X			X
22L9E01260			X	X			
22L9E01342	X			X		X	X
22L9E01304		X		X			X
22L9E01465				X			X
11H2E00483	X	X		X			
1190E01367		X			X	X	
1197E02209				X		X	X
2277E01546				X			X
22J3e01858			X	X		X	
22L9E01476				X			X
22L9E01480				X			X
22L9E01450				X			X
2277E01538	X		X	X	X		
2277E01537				X	X		X
4M41E02023	X	X		X			
22L9E01436				X			X
4M41E02021		X		X			X
4S21E03688	X			X		X	X
1190E01379		X		X		X	
4S21E03687					X		X
4XA2E00018		X		X			
4XA2D00016		X		X		X	
4X56E00780	X	X		X			
22L9E01321				X			X
22L9E01374				X			X
22L9E01483		X		X			X
22L9E01344				X			X
22L9E01403				X			X
22L9E01484				X			X
22L9E01485				X			X
2277E01536		X		X	X	X	
2277E01541	X		X	X			
22J3e01859	X			X		X	X
4B01E14007				X		X	X
4B40E00080	X			X		X	X
4B40E00083			X	X		X	X
4X56E00806	X	X	X	X		X	X
22L9E01495				X	X		X
2277E01539	X		X	X			
4XA1E00007	X	X		X	X		
22L9E01271	X	X		X		X	
22L9E01314		X		X		X	
22L9E01315	X	X		X			X
22L9E01372	X			X			X
22L9E01455				X			X
22L9E01472				X			X
22L9E01491				X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
22L9E01492				X			X
4M01E02008			X	X			
4M41E02046	X	X					
4S21E03689	X		X				
5e76e00261				X			X
5e76e00263		X	X	X		X	X
5e76e00262				X		X	X
22L9E01497				X			X
22L9E01487				X	X		X
22J3e01860		X		X		X	
2277E01575	X		X	X			
4XA2E00010		X		X			
4XA2E00006	X	X		X			
22L9E01350				X			X
4M41E02054		X	X	X			
4M41E02050	X	X		X			
4XA2E00003	X	X		X		X	
4X56EOO782				X			X
5EG5E90017				X	X		X
4M01E02007	X		X	X		X	
1190E01382		X	X	X			
5E03E00972				X			X
4XA1E00002	X	X	X	X			X
4M41E02035	X	X		X			X
22L9E01413				X			X
22L9E01490				X	X		X
4S21E03678	X			X			X
5EH2E00010				X	X		X
5EH2E00025				X	X		X
4X81E00079	X	X	X	X		X	X
1190E01383	X			X			X
22J3e01865		X		X			
22L9E01471	X		X	X			
4M41E02051	X	X					
4XA1E00005	X	X		X			
4B41E00161		X	X	X			
221ZE00232	X			X		X	
22J3e01862		X		X		X	X
22L9E01392				X	X		X
5EH2E00016				X			X
22L9E01419	X			X			X
22L9E01468				X			X
22L9E01382		X		X		X	X
22L9E01362	X			X		X	
5e76e00275				X	X		X
5EH3E00008	X			X			X
5E0300980				X			X
5e03e00976				X			X
5E03E00973				X			X
4S21E03698	X			X			X
7U23E00008	X	X		X			
7U23E00011	X		X				
7U23E00012	X		X	X			

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
7M04E00429	X		X	X			
7M04E00430		X	X	X		X	
22L9E01463				X			X
22L9E01462				X			X
22L9E01318		X		X		X	X
22L9E01412				X			X
11H2E00487		X		X		X	
22L9E01385			X	X		X	
4S21D03690	X	X		X		X	X
4S21E80023	X	X		X		X	
228HE00003	X	X		X		X	
2277E01564	X		X	X			
4S21E03696	X	X			X		
22J3e01867		X	X	X			
22J3e01872	X	X		X			
4S21E80022		X		X		X	
2277E01578	X	X		X			
2277E01560		X	X	X			
4M67E02002				X		X	X
2277E01547		X		X	X	X	
2277E01545		X		X			X
22L9E01467	X		X	X			
4M41E02028		X					X
4L01E00440	X		X	X		X	X
4S21E03697	X	X				X	X
4S21E03700				X		X	X
2277E01554	X	X		X		X	
2277E01553	X	X	X	X		X	
2277E01583	X	X		X			
2277E01581		X		X			
1190E01391	X	X	X	X	X		X
22L9E01276				X			X
22L9E01453				X			X
22L9E01353	X		X	X		X	
22L9E01375			X	X			X
4M41E02053	X	X		X			
4XA2E00028		X		X			
4X56E00814	X			X			X
4XA2E90004		X		X			X
4XA2E00030		X		X			
4XA2E00015		X		X		X	
22L9E01348		X		X		X	
22L9E01371			X	X		X	X
22L9E01425				X	X		X
4L01E00441	X	X	X				
22L9E01386				X			X
22L9E01405				X			X
5E27E01048	X			X			X
5e03e00975				X			X
5EH3E00010				X			X
5e76e00273	X			X			X
7U23E00020	X	X					
22L9E01457		X		X			X

File #	Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
2277E01556			X	X		X	
22L9E01475	X			X			
22L9E01489		X		X			
2277E01592		X		X			
5e03e00977	X			X			X
5e03e00983				X			X
5EH2E00001				X			X
5EH2E00020				X			X
5EH2E00023				X	X	X	X
4XA2E00025		X		X			X
4XA2E00001	X		X	X		X	X
22L9E01379		X		X		X	
22L9E01488				X			X
4B45E00005	X	X		X	X	X	X
4B45E00010	X			X			X
22J3e01864			X	X			X
2277E01561			X	X		X	
4S21E03702	X		X			X	
4S21E03718	X					X	X
4S21E03712	X					X	X
4M41E02036	X						X
11H2E00484	X	X	X		X	X	
11H2E00485	X			X			X
4XA2E00024	X		X	X			
4M67E02003	X	X		X			X
7M14E00002	X		X				
4M41E02042	X		X				
7U23E00014	X	X					
4S21E03711				X		X	X
5e03e00981				X			X
5e03e00982				X			X
5EH2E00024				X			X
5e76e00264	X	X		X		X	
7U23E00021	X		X				
2277E01585		X		X	X		
7M04E00426	X	X					X
4X56E00802	X			X		X	X
4M41E02047	X		X	X			X
4X56E00805	X			X			X
2277E01580		X		X			
2277E01568	X	X		X		X	
7U21E90001	X	X		X			
4S21E03707				X			X
2277E01587		X		X		X	
1151E01014						X	X
5e76e00266		X		X			X
1151E01000		X				X	X
22L9E01106				X			X
4L01E00435				X		X	
4S21E03663	X			X		X	X

Total Homes: 1000

Total Count:

Attic/Ceiling	Basement/Header	Exterior Wall	Air Sealing	Water Heater	Window/Door	Furnace/Boiler
406	349	289	888	70	292	537

UNION GAS LIMITED

Undertaking of Mr. Goulden

To Mr. Shepherd

To provide the reference in the runsmart program where “non-participation” is defined as 24 months of non-participation.

Response:

Union provided this clarification verbally at the Stakeholder Consultation session on March 4, 2015 but it was not provided in evidence until the discussion referenced at this undertaking.

UNION GAS LIMITED

Undertaking of Mr. Tetreault
To Mr. Shepherd

To calculate on a best-efforts basis weather-adjusted figures for 2014 average residential consumption.

Response:

Please see the table below. Given the residential normalized average consumption has decreased from 2010 to 2014, Union did not provide any further analysis on why average use is increasing despite DSM.

Table 1

<u>Year</u>	Residential Actual Consumption <u>m³</u>	Residential Normalized Average Consumption <u>m³</u>
2010	2,256	2,322
2014	2,583	2,300

Notes:

Weather normalization at 2014 weather factors.

2010 actual usage as per Exhibit K2.4, page 73 (2,256).

2014 actual usage as per Exhibit B.T13.Union.GEC.9 (2,583).

UNION GAS LIMITED

Undertaking of Mr. Goulden

To Mr. Mondrow

To produce any data on what percentage on average of the budget for an efficiency project is defrayed for large industrial customers in the T1 rate class by DSM programming.

Response:

The average defrayed incremental cost for Rate T1 custom projects in 2013 was 7% , and 11% in 2014.

UNION GAS LIMITED

Undertaking of Mr. Dent
To Mr. Mondrow

To give its expert view on the opinions quoted at page 42, at page 55, and the two-paragraph section on page 23 of the IGUA compendium.

Response:

In Canada, integrated (blast furnace-based) steel making is located entirely within Ontario, and electric arc furnace (EAF) capacity represents only 26% of Ontario steelmaking capacity (tons/y)¹. Direct comparison between the U.S. steel industry and the Ontario steel industry on energy intensity or savings potential cannot therefore be made since there are more opportunities to carry out natural gas efficiency projects in an integrated steel plant than an EAF-based steel plant. This is because of the greater diversity of energy sources (coal, coke oven gas, blast furnace gas, natural gas and electricity) used at an integrated steel plant compared with an EAF plant (typically only electricity and natural gas).

An in-depth study² published by Natural Resources Canada's Office of Energy Efficiency with the Canadian Steel Producers Association in 2007 compares the actual reported energy performance of Canadian steel plant process equipment with upgraded plant considered by the International Iron & Steel Institute (IISI) to be both commercially available and economically attractive. Page 80 of this Report shows that the fuel use efficiency of slab reheat furnaces varies widely, and none of these furnaces are able to achieve the IISI base performance. Page 79 shows that the integrated steel plants have widely varying levels of flaring of site generated fuels. Reduction of flaring at an integrated steel plant can be directly associated with reduced natural gas consumption.

Additionally, Union participated through its Large Volume DSM Program in 57 efficiency projects and studies in the steel sector in 2012 through 2014, indicating that there continue to be opportunities to improve the efficiency of natural gas use in this sector. For example, a suite of slab reheat furnace upgrade projects at ArcelorMittal Dofasco received a Leadership Award from the Canadian Industry Program for Energy Conservation (CIPEC). The projects are highlighted in CIPEC's 2012 Annual Report³.

Union therefore concludes that the passages cited in the IGUA Compendium do not accurately describe the status of energy efficiency opportunities in the Ontario steel industry.

Reference

1. Association for Iron & Steel Technology 2012 Directory of Iron and Steel Plants
2. Benchmarking Energy Intensity in the Canadian Steel Industry, Natural Resources Canada, 2007 <http://www.nrcan.gc.ca/energy/efficiency/industry/technical-info/benchmarking/canadian-steel-industry/5181>

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EB-2015-0029

Exhibit J4.4

Page 101

3. 2012 Annual Report, Canadian Industry Program for Energy Conservation.
<https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/oeefiles/pdf/CIPEC-AR-2012-eng-accessible.pdf>

UNION GAS LIMITED

Undertaking of Mr. Dent
To Mr. Brett

To advise how many of the gas-fired generator customers are in Rate class T2 and 100 and how many are co-generators.

Response:

Currently, Union has eight customers operating 13 plants in the Rate T2 and Rate 100 large volume classes. Of these 13 plants, five are co-generators owned by four customers.

UNION GAS LIMITED

Undertaking of Mr. Dent
To Mr. Brett

To identify the number of power producers that are contained in the survey in Attachment A.

Response:

There are eight power producers that are contained in the survey at Exhibit A, Tab 3, Appendix A, Attachment A.

UNION GAS LIMITED

Undertaking of Mr. Goulden
To Mr. Poch

To advise the sum of the first full year annual savings from the last ten years of your DSM programs in cubic metres as compared to 2014 throughput.

Response:

Please see the table below.

Net Annual Natural Gas Savings
as a Percentage of 2014 Throughput

Year	Net Annual Natural Gas Savings (10 ³ m ³) ¹ (a)	2014 Total Throughput for Rate Classes that DSM will be Developed For and Offered To (10 ³ m ³) ² (b)	Net Annual Natural Gas Savings as a Percentage of 2014 Throughput (c)=(a)/(b)
2004	60,003	14,204,104	0.42%
2005	71,807	14,204,104	0.51%
2006	90,475	14,204,104	0.64%
2007	55,852	14,204,104	0.39%
2008	61,852	14,204,104	0.44%
2009	92,604	14,204,104	0.65%
2010	121,116	14,204,104	0.85%
2011	139,027	14,204,104	0.98%
2012	137,438	14,204,104	0.97%
2013	179,967	14,204,104	1.27%
2014 (Pre-Audit)	149,764	14,204,104	1.05%

Notes:

- 1 Exhibit B.T13.Union.VECC.2.
- 2 Exhibit A, Tab 1, Appendix A, Schedule 4.