GHG EMISSIONS FORECASTS

1. This evidence sets out an overview of Enbridge's 2017 forecast of Greenhouse Gas ("GHG") emissions.

2. Under *Ontario Regulation 143/16 "*Quantification, Reporting and Verification of Greenhouse Gas Emissions" ("O.Reg 143/16") and the associated "Guidelines for Quantification, Reporting and Verification of Greenhouse Gas Emissions" ("Guidelines"), Enbridge as a natural gas distributor, is required to report emissions from the distribution of natural gas (ON.400). Enbridge is also required to report emissions from stationary combustion (ON.20) and from the operation of equipment related to natural gas (ON.350). It should be noted that 2016 is the first year that reporting under sections ON. 400 and ON.350 is required for natural gas utilities.

3. Enbridge has prepared 2017 forecasts of GHG emissions related to customers use of natural gas. These are referred to as "Customer-related obligations". It has also prepared forecasts of emissions related to the operation of its distribution, transmission and storage systems. These are referred to as "Facility-related obligations."

4. In order to estimate GHG emissions, forecasted natural gas volumes were converted to GHG emissions in tonnes of carbon dioxide equivalent ("tCO_2e"), using the methodology, emission factors and global warming potentials provided in the O.Reg 143/16 and the Guidelines.

Customer-Related Emissions Forecast

5. The total customer-related emissions for 2017 based on the customer-related volume forecast is 20,907,621 tCO_2e, accounting for approximately 99% of the total

forecasted carbon compliance obligation. The methodology, source and assumptions for the volume forecast can be found in Exhibit B, Tab 2, Schedule 1 and the assumptions and the derivation of customer-related GHG emission forecast is set out in Table 1 and 2 of this exhibit.

Facility-Related Emissions Forecast

6. The total facility-related emissions for 2017 based on the facility-related volume forecast is 230,055 tCO_2e, accounting for approximately 1% of the total forecasted carbon compliance obligation. The methodology, source and assumptions for the volume forecast can be found in Exhibit B, Tab 2, Schedule 1 and the assumptions and derivation of the facility-related GHG emissions forecast is set out in Table 3 and 4 of this exhibit.

Total 2017 GHG Emissions Forecast

7. The total GHG emissions forecast, inclusive of both the customer-related and facility-related volumes is 21,137,676 tCO_2e. A summary of the GHG emissions is included in Table 5 of this evidence.

TABLE 1: 2017 CUSTOMER-RELATED EMISSIONS BY RATE CLASS

		Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
Line	Rate	Net Volumes[1]	CO_2 Emissions[2]	CH_4 Emissions[3]	N_2O Emissions[4]	Net CO_2e Emissions[5]
		(10^3m^3)	(Tonnes CO_2)	(Tonnes CH_4)	(Tonnes N_2O)	(Tonnes CO_2e)
1.1	1	4,911,477.9	9,150,083.3	181.7	171.9	9,207,189.1
1.2	6	4,742,142.3	8,834,611.1	175.5	166.0	8,889,748.0
1.3	9	262.8	489.6	0.0	0.0	492.7
1.4	100	0.0	0.0	0.0	0.0	0.0
1.5	110	458,354.0	853,913.5	17.0	16.0	859,242.8
1.6	115	185,852.4	346,243.0	6.9	6.5	348,403.9
1.7a	125	305,896.4	569,885.0	11.3	10.7	573,441.7
1.7b	125D	325,082.3	605,628.3	12.0	11.4	609,408.1
1.8	135	60,899.0	113,454.8	2.3	2.1	114,162.9
1.9	145	49,227.2	91,710.3	1.8	1.7	92,282.6
1.10	170	113,307.4	211,091.7	4.2	4.0	212,409.1
1.11	200	0.0	0.0	0.0	0.0	0.0
1.12	300	448.4	835.37	0.02	0.02	840.6
1	Total Customer-Related	11,152,950.1	20,777,946.0	412.7	390.4	20,907,621.4

Notes:

(1) Exhibit B, Tab 2, Schedule 1, Table 1, Col. 6

(2) Col. 1 x Table 2, Line 2, Col. 1 x 1000

(3) Col. 1 x Table 2, Line 2, Col. 2 x 1000

(4) Col. 1 x Table 2, Line 2, Col. 3 x 1000

(5) Col. 2 + (Col. 3 x Table 2, Line 3, Col. 2) + (Col. 4 x Table 2, Line 3, Col. 3)

TABLE 2: CONVERSION FACTORS

		Col. 1	Col. 2	Col. 3
Line		CO_2 Emission Factor[6]	CH_4 Emission Factor[7]	N_2O Emission Factor[7]
2	Tonne/m^3	0.001863	0.000000037	0.000000035

Line		Methane[8]	Nitrous Oxide[8]
3	Global Warming Potential for Carbon Dioxide Equivalent	21	310

Notes:

(6) Ontario Ministry of Environment and Climate Change's "Guideline for Quantification, Reporting and Verification for GHG Emissions - January 2016", Table 400-2

(7) Ontario Ministry of Environment and Climate Change's "Guidelines for Quantification, Reporting and Verification for GHG Emissions - January 2016", Table 20-4

(8) Ontario Regulation 143/16 "Quantification, Reporting and Verification of Greenhouse Gas Emissions", Schedule 1

TABLE 3: 2017 FACILITY-RELATED EMISSIONS

Line		Col. 1 Volumes[1] (10^3m^3)	Col. 2 CO_2 Emissions[2] (Tonnes CO_2)	Col. 3 CH_4 Emissions[3] (Tonnes CH_4)	Col. 4 N_2O Emissions[4] (Tonnes N_2O)	Col. 5 CO_2e Emissions[5] (Tonnes CO_2e)
1.	Company Use - Buildings	1,505.9	2,805.5	0.1	0.1	2,823.0
2.	Company Use - Boilers	3,930.2	7,262.9	7.3	0.2	7,477.0
3.		5,436.2	10,068.4	7.4	0.2	10,300.1
4.	Company Use - Fleet	1,500.0	2,794.5	0.1	0.1	2,811.9
5.	Total Company Use	6,936.2	12,862.9	7.5	0.3	13,112.0
6.	Unaccounted For Gas (UAF)	98,279.0	183,093.8	3.6	3.4	184,236.5
7.	Compressor Fuel	17,191.8	31,769.4	32.1	0.8	32,706.2
8.	Total Facility-Related	122,407.0	227,726.1	43.2	4.6	230,054.7

Notes:

(1) Exhibit B, Tab 2, Schedule 1, Table 2, Col. 1

(2) Col. 1 x Table 4, Line 1, Col. 1 x 1000 (For Boilers and Compressor Fuel: Col. 1 x Table 4, Line 2, Col. 1 x Table 4, Line 3, Col. 1)

(3) Col. 1 x Table 4, Line 1, Col. 2 x 1000 (For Boilers and Compressor Fuel: Col. 1 x Table 4, Line 2, Col. 2 x Table 4, Line 3, Col. 2)

(4) Col. 1 x Table 4, Line 1, Col. 3 x 1000 (For Boilers and Compressor Fuel: Col. 1 x Table 4, Line 2, Col. 3 x Table 4, Line 3, Col. 3)

(5) Col. 2 + (Col. 3 x Table 4, Line 5, Col. 2) + (Col. 4 x Table 4, Line 5, Col. 3)

TABLE 4: CONVERSION FACTOR

Line		Units	Col. 1 CO_2 Emission Factor[6, 10]	Col. 2 CH_4 Emission Factor[7]	Col. 3 N_2O Emission Factor[7]
1	Fleet, Buildings & Unaccounted For Volumes (UAF)	Tonne/m^3	0.001863	0.000000037	0.000000035
2	Boilers & Compressor Fuel Volumes	Tonne/GJ	0.04903	0.00004958	0.000001305
3	Budget Heat Value[8]	GJ/10^3m^3	37.69	37.69	37.69

Line		Methane[9]	Nitrous Oxide[9]
4	Global Warming Potential for Carbon Dioxide Equivalent	21	310

Notes:

(6) Ontario Ministry of Environment and Climate Change's "Guideline for Quantification, Reporting and Verification for GHG Emissions - January 2016", Table 400-2

(7) Ontario Ministry of Environment and Climate Change's "Guidelines for Quantification, Reporting and Verification for GHG Emissions - January 2016", Table 20-4

(8) Assumed Budget Heat Value = 37.69 GJ/10^3m^3. This value should be assumed as a placeholder. In calculating actual emissions, higher heating value will be used.

(9) Ontario Regulation 143/16 "Quantification, Reporting and Verification of Greenhouse Gas Emissions", Schedule 1

(10) CO_2 Emission Factor for 'Boilers & Compressor Fuel': Ontario Ministry of Environment and Climate Change's "Guidelines for Quantification, Reporting and Verification for GHG Emissions - January 2016", Table 20-3

TABLE 5: 2017 SUMMARY OF CUSTOMER-RELATED AND FACILITY-RELATED FORECAST GHG EMISSIONS

Line	Description	2017 Forecast
	Customer-Related GHG Emissions Forecast	
1	Customer-related Forecast Volume (10^3 m^3)	11,152,950
2	ON.400 Emission Conversion Factor (tonnes CO_2e/m^3)	0.001875
3	**Customer-Related Emissions (tonnes CO2e)**	**20,907,621**
	Facility-Related GHG Emissions Forecast	
4	Facility-related Forecast Volume (10^3 m^3)	122,407
5	ON.20 Emission Conversion Factor (tonnes CO_2e/m^3)	0.001902
6	**Facility-Related Emissions (tonnes CO2e)**	**230,055**
	Total Compliance Obligation	
7	**Total Compliance Obligation (tonnes CO2e)**	**21,137,676**