

COMPLIANCE PLAN – ABATEMENT ACTIVITIES – FACILITY

1. Enbridge recognizes that abating Greenhouse Gas (“GHG”) emissions from its own operations helps the province reach its GHG emission targets, and can also be a tool to reduce the Company’s overall Cap and Trade compliance obligation.
2. Enbridge is committed to identifying and reviewing opportunities to reduce its operational GHG emissions; however, the Company notes that the facility-related obligations only represent 1% of its total obligation under the Cap and Trade regulation, and therefore the potential abatement opportunities present smaller GHG savings than the customer-related abatement opportunities.
3. Enbridge notes some facility-related GHG abatement activities that it may undertake will reduce overall emissions in Ontario, but may not impact on the Company’s own Cap and Trade compliance obligations. As an example, energy efficiency initiatives that reduce the Company’s use of electricity do not reduce its Cap and Trade obligation, though they do help to reduce provincial emissions on an overall basis. Additionally, initiatives such as natural gas vehicles (“NGV”) may increase the Company’s emissions from natural gas, however, these can lower emissions from use of other types of fuel (in the case of NGV this would be diesel and gasoline).
4. Table 1 below identifies the facility-related abatement initiatives that Enbridge plans to pursue, indicating the stage of the Initiative Funnel that each has reached. The stages of the Initiative Funnel are discussed in Exhibit C, Tab 5, Schedule 1.

Witnesses: J. Murphy
E. Naczynski

Table 1: Abatement Initiatives Summary

Initiative Development Stage	Initiative	2018 OEB Approvals Required
Stage 1: Conceptual	Portable Booster Compressor	Approval for 2 FTEs to support investigation, planning and project management activities, to be funded through the GGEIDA. Approval of funding of up to \$2M starting in 2018 in the Low Carbon Innovation Fund ("LCIF") to advance pilot projects and research throughout stages one to three of the Initiative Funnel that would enable a more complete assessment of promising technologies and opportunities for eventual implementation. The LCIF would be tracked through the GGEIDA.
	High Bleed Pneumatic Devices	
	Building Efficiency Improvements	
	Natural Gas Air Source Heat Pump	
Implementation / Existing Activity	Existing Facility Abatement Initiatives	None

Stage One (Conceptual) Initiatives

5. As outlined in EB-2016-0300 (Exhibit C, Tab 3, Schedule 5), in 2016 Enbridge developed a multi-department team to discuss abatement opportunities for facility-related GHG emissions related to distribution and storage operations. This team developed a list of potential abatement opportunities; however, this work did not include quantifying the emission reduction potential, costs or feasibility of the opportunities identified.

6. Enbridge has undertaken a study in 2017 to review the electricity and natural gas use, and the resulting emissions, from the operations of six of its office buildings. This study has identified potential abatement opportunities and has suggested several initiatives that can be explored over the next five years. The results of any abatement initiatives that are implemented at these six buildings will be evaluated and incorporated as applicable to the Company's other facilities.

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7. In 2018, Enbridge intends to review the following initiatives that were identified by the work conducted in 2016 and 2017. These initiatives have been identified as those that are most likely to assist the Company in achieving GHG reduction on sources of emissions that are covered by Cap and Trade:
- a. Portable booster compressor: Enbridge has previously purchased a portable booster compressor, which is used to transfer natural gas out of a pipeline segment that requires isolation into another pipeline segment. This is done to reduce the amount of natural gas that is vented to the atmosphere. In 2018, the Company will undertake an assessment of the use of this technology in order to identify its current limitations and required improvements, with the goal to maximize its use where possible to avoid venting natural gas. As part of this initiative, Enbridge will do a scan of other technologies that can be used to reduce pipeline venting emissions to determine if alternative solutions exist.
 - b. Pneumatic devices: Enbridge has already removed many high bleed pneumatic devices from its distribution system. In 2018, Enbridge will review the remaining high bleed pneumatic devices to determine if low or no-bleed alternatives could be installed in a cost effective manner.
 - c. Building efficiency improvements: As a result of the study on its energy efficiency and emissions from office buildings, Enbridge will be undertaking a review of operational improvements to ensure current building systems are operated in an efficient manner that reduces natural gas use.

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- d. Natural gas air source heat pumps: The study on energy efficiency and emissions from office buildings has identified natural gas air source heat pumps as a potential abatement opportunity at the Company's office facilities. As discussed in Exhibit C, Tab 5, Schedule 2, Enbridge intends to conduct field tests on natural gas air source heat pumps for residential applications. In 2018, Enbridge will review the outputs from this customer-related abatement initiative to determine the applicability for replacing natural gas boilers at its own office buildings, and other Company owned-facilities.
8. To pursue the initiatives described above, Enbridge will make use of the incremental FTEs and Low Carbon Initiative Fund ("LCIF") that are discussed in Exhibit C, Tab 5, Schedule 1.
 9. The initiatives identified above will be reviewed in 2018 to determine if they can be advanced to either Stage 2 (Formulate) for pilot scale testing or Stage 3 (Proposal) for full scale implementation. The results of these initiatives will be reviewed in future Compliance Plans submissions as appropriate.

Existing Facility Abatement Initiatives

10. Enbridge has previously completed several key projects that have reduced facility-related GHG emissions to 20% below what they were in 1990. This includes the complete replacement of cast iron pipe, replacement of pneumatic controllers, and efforts to reduce fugitive emissions through damage prevention and improved leak survey and leak repair programs.

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11. Enbridge has also undertaken initiatives that, although they do not reduce the Company's Cap and Trade compliance obligation, have led to an overall reduction in its direct and indirect GHG emissions. Examples include Enbridge's fleet of over 600 natural gas vehicles, building and renovating the Company's buildings to LEED certification requirements, energy conservation measures and the installation of a turboexpander to generate clean electricity for the Company's head office.
12. Through ongoing participation in industry committees, such as the Canadian Energy Partnership for Environmental Innovation ("CEPEI"), the Company continues to work to better understand and refine the estimates of fugitive and venting emissions on its gas distribution and gas storage systems. Better estimation methods lead to improved accounting for methane emissions, which are a portion of the Company's unaccounted for gas.
13. As part of Enbridge's asset management program, ongoing asset replacement and upgrade projects are undertaken. Often the projects and programs under consideration have the added benefit of reducing gas loss from distribution assets and therefore reduce GHG emissions. Enbridge has initiated updates to its asset management process to enable the review of the GHG reduction potential of projects and take into account the cost of GHG emissions (using the Board's Long-Term Carbon Price Forecast).
14. Projects that are included in Enbridge's current asset management program that result in the greatest reduction of GHG emissions include:
 - a. AMP fitting replacement program;
 - b. Meter set replacements; and
 - c. Vintage steel replacement program.

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15. Cumulatively, these three projects are estimated to reduce annual GHG emissions by approximately 800 tonnes CO₂e each year.

Abatement Required Under Federal Methane Regulation

16. Enbridge is staying abreast of the evolution and possible requirements from the proposed “Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)” (the “Methane Regulation”), which is still in a consultation phase. Once the final Methane Regulation is posted in Canada Gazette II, Enbridge will work to identify the specific abatement initiatives that are required in order to comply with this complementary climate change regulation by the required timelines. In the interim, the Company is taking the following steps to become ready for the Methane Regulations:
 - a. In late 2017, Enbridge will conduct leak detection surveys at its gas storage compressor stations to identify leaking components, as required under Ontario’s GHG reporting regulation. In 2018, Enbridge will review the results of the survey to determine if any repairs are required. The Company will begin to develop formalized leak detection and repair (“LDAR”) program. This initiative will prepare Enbridge for compliance with the LDAR requirements under the Methane Regulations.
 - b. In late 2017, Enbridge will conduct surveys of the rod packing emissions from each of its reciprocating compressors, as required under Ontario’s GHG reporting regulation. In 2018 the Company will review the results of the survey to determine if any maintenance is required.

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