NEEDS FOR AND ALTERNATIVES TO (NFAT)

Manitoba Hydro Undertaking #69

Manitoba Hydro to file the intensity based GHG emissions for the Development Plans filed in the NFAT (listing per kWh or GWh of electricity produced).

Response:

Table 1 below provides the greenhouse gas (GHG) emission intensity (Tonnes CO_2e/GWh) associated with each of the development plans shown in Appendix 9.1 of the NFAT submission. The emission intensities are consistent with the Cumulative GHG Operating Emissions shown in Appendix 9.1. These emissions are a result of the operation of new and existing fossil fueled generation in Manitoba. For each of the development plan's, the GHG emission intensities shown below reflect the emissions from fossil fueled generation divided by the total generation in Manitoba from all sources. It should be noted that the development plans including Keeyask and Conawapa result in the lowest emission intensities.

It is important to recognize that the emission intensity values are diluted substantially by Manitoba's renewable generation. The GHG emission intensities of fossil fuel generation are shown in Table 2 to provide a clearer representation of the specific technologies contributing to the emissions associated with these development plans. The emission intensities of these technologies are much higher than the emission intensities of the system as a whole or those of Keeyask and Conawapa.

Table 1

Development Plan	1	2	3	4	5	6	7	8
	All Gas	K22/Gas	Wind/Gas	K19/Gas24/250MW	K19/Gas25/750MW (WPS Sale & Inv.)	K19/Gas31/750MW	SCGT/C26	CCGT/C26
Cumulative Generation GHG Intensity (Tonnes CO_2e/GWh)	28.4	18.5	13.3	19.9	13.1	15.0	10.4	13.8

Development Plan	9	10	11	12	13	14	15
	Wind/C26	K22/C29	K19/C31/250MW	K19/C31/750MW	K19/C25/250MW	K19/C25/750MW (WPS Sale & Inv.)	K19/C25/750MW
Cumulative Generation GHG Intensity (Tonnes CO_2e/GWh)	7.7	5.9	9.1	5.6	5.7	5.5	5.5

Table 2

Fossil Fuel Generation Resource	Emission Intensity (Tonnes CO_2e / GWh)
Existing Coal - Brandon 5	1071
Existing Gas - Brandon 6 & 7	657
Existing Gas - Selkirk 1 & 2	601
New Combined Cycle Gas Turbine	333
New Simple Cycle Gas Turbine	506