

**2002/03 GPG Process Guide for Greenhouse Gas Intensity Adjustment**  
**BC Hydro Green Power Generation Program – 2002/03**

**OVERVIEW**

Bid prices will be adjusted according to greenhouse gas (GHG) intensity **for evaluation purposes** in order to determine ranked bid prices. Bids having a GHG intensity lower than a combined cycle gas turbine will be reduced by up to \$3 per MWh. Bids having a GHG intensity higher than a combined cycle gas turbine will not be increased. Projects that fail to achieve the expected GHG intensity will be subject to liquidated damages capped at an amount equal to the bid price adjustment.

BC Hydro retains ownership of all emission reductions associated with any displaced thermal generation of electricity resulting from BC Hydro's purchase of electricity from the Bidder. The Bidder retains responsibility for all environmental liabilities and regulatory costs associated with the Bidder's project, including but not limited to those related to greenhouse gases.

**PROCESS**

**1. Document Submission**

Bidders for biomass and biogas projects must forward the completed 2002/03 GPG Greenhouse Gas Intensity Adjustment Form by the deadline indicated under Tender Closing Time and Schedule, to the BC Hydro – Purchasing Department in accordance with the instructions under Communications and Submission of Forms:

BC Hydro will confirm the applicable GHG Intensity Adjustment to the Bidder on or before the deadline indicated under Tender Closing Time and Schedule.

**2. GHG Intensity Adjustment Formula**

GHG Intensity Adjustment = the greater of zero or  $[3.00 - 8.333 * \text{Project GHG Intensity}]$ , in C\$/MWh (rounded to the nearest cent).

**3. Calculating Project GHG Intensity**

The GHG intensity of the Seller's Plant will be determined as follows:

1. Start with total annual fuel input to the Seller's Plant.
2. If the Seller's Plant cogenerates steam and electricity, estimate the annual fuel input that is attributable to electricity production by estimating the fuel input that would be necessary to meet the facility's annual steam requirement in a non-cogeneration configuration. The difference between this amount and the total annual fuel input to the Seller's Plant is the annual fuel input that is attributable to electricity production.

3. Calculate annual GHG emissions associated with the annual fuel input that is attributable to electricity production in metric tonnes of carbon dioxide equivalent (CO<sub>2</sub>e). Use Environment Canada's GHG emission factors<sup>1</sup>. GHGs include CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. CH<sub>4</sub> and N<sub>2</sub>O are to be converted into CO<sub>2</sub>e using Global Warming Potential factors of 21 and 310 respectively.<sup>2</sup> Also, GHG intensity calculations should not include any emission reductions resulting from the combustion of biomass or biogas.

If the fuel input is biomass (woodwaste) or biogas, note that biomass and biogas are considered CO<sub>2</sub> neutral, but not CH<sub>4</sub> or N<sub>2</sub>O neutral, for GHG accounting purposes, therefore GHG intensity for biomass-fired and biogas-fired electricity should be based only on emissions of CH<sub>4</sub> and N<sub>2</sub>O.

4. Estimate total annual electricity production by the Seller's Plant, whether consumed onsite or sold to BC Hydro or others, in megawatt-hours (MWh).
5. Calculate the ratio of annual GHG emissions to annual electricity production, in tonnes CO<sub>2</sub>e/MWh. This ratio is the GHG intensity.

---

<sup>1</sup> [http://www.ec.gc.ca/pdb/ghg/ghg\\_docs/Emission\\_Factors.pdf](http://www.ec.gc.ca/pdb/ghg/ghg_docs/Emission_Factors.pdf)

<sup>2</sup> So one tonne of CH<sub>4</sub> equals 21 tonnes of CO<sub>2</sub>e and one tonne of N<sub>2</sub>O equals 310 tonnes of CO<sub>2</sub>e.

**2002/03 GPG Greenhouse Gas Intensity Adjustment Form**

BC Hydro Green Power Generation Program – 2002/03

**Applicant Information**

Project Name:

Contact Name for this Form:

Company Name:

Phone:

Address:

Fax:

City:

E-mail:

Province:

Postal Code:

**(a) Brief Description of the Project and Fuel Use**

**Project GHG Intensity Calculation**

Fuel type(s) (if more than one, include percentages):

Total annual fuel input, by fuel:

Units:

If a cogeneration plant, annual fuel input attributable to electricity production, by fuel:

Units:

Emission factors, by fuel:

CO<sub>2</sub>:

Units:

CH<sub>4</sub>:

Units:

N<sub>2</sub>O:

Units:

Annual emissions:

Tonnes

Global Warming Potential Factors

Tonnes CO<sub>2</sub>e

CO<sub>2</sub>:

x 1

CH<sub>4</sub>:

x 21

N<sub>2</sub>O:

x 310

Total

--

Total annual electricity production:

MWh

Project GHG intensity (PGI):

Tonnes CO<sub>2</sub>e/MWh

**(b) GHG Intensity Adjustment (round to whole cents)**

3.00 – 8.333 \* PGI =

\$/MWh

Greater of zero or above value =

\$/MWh

<b>Professional Engineer's Signature and Seal</b>	
I attest that the above information is true and accurate based on project design to date.	
Name:	Date:
Signature:	Sealed <sup>1</sup> :
<b>BC Hydro Use</b>	
Received by:	Date and time received:
Applicable GHG Intensity Adjustment:	\$/MWh

If you need to add other calculations or explanatory information, use the back of this page or attach additional pages.

---

<sup>1</sup> The Professional Engineer must be a practicing member in good standing of the Association of Professional Engineers and Geoscientists of B.C.