



# Discussing greenhouse gas emissions in Environmental Review

## What is the purpose of this document?

This document gives guidance to project proposers who are required to provide information on greenhouse gas (GHG) emissions in an Environmental Assessment Worksheet (EAW) or an Environmental Impact Statement (EIS). This document only applies to projects where the Minnesota Pollution Control Agency (MPCA) is the responsible governmental unit for the EAW or EIS.

## Who is required to respond to GHG questions in an EAW or EIS?

If your project requires an EAW, or an EIS, as well as an air emission permit from the MPCA, then you must provide information regarding GHG emissions.

## What are GHGs?

The following six pollutants are the GHGs for the purpose of environmental review and air emissions permitting: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

## What types of projects emit GHGs?

Greenhouse gas emissions are typically associated with burning fossil fuels, but can be generated through many other processes (e.g. ammonia production, nitric acid production, refrigerator and air conditioner production, semiconductor production, etc.).

The following table shows common types of projects and their associated GHG emissions. This table is not all inclusive and does not take the place of analyzing your specific project for its GHG emissions.

### Common sources of GHG emissions

Emission source type	Typical GHG emitted
Animal feedlots	CH <sub>4</sub> , N <sub>2</sub> O
Electricity or steam production	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O
Ethanol plants	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O
Petroleum refineries	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O
Paper or pulp processing	CO <sub>2</sub>
Solid waste incineration	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O
Solid waste landfills	CH <sub>4</sub>
Wastewater treatment	N <sub>2</sub> O, CH <sub>4</sub>

## What are my GHG information requirements for environmental review?

The requirements for an EAW and an EIS are usually not the same. The rest of this document is split into two parts. Part one applies to EAW projects and Part two applies to EIS projects. More information on MPCA's Environmental Review Program can be found at:

[www.pca.state.mn.us/index.php/topics/environmental-review/environmental-review.html](http://www.pca.state.mn.us/index.php/topics/environmental-review/environmental-review.html).

### Part 1 - Environmental Assessment Worksheets

## Where do I provide GHG information in an EAW?

Provide your GHG information in question 23 of the EAW form.

## What information do I provide?

Indicate the project's potential-to-emit (PTE) for each of the six GHGs, using the same data that you used in your project's air emissions permit application. The following MPCA webpage provides guidance on how to calculate your GHG emissions: [www.pca.state.mn.us/index.php/emission-calculations.html](http://www.pca.state.mn.us/index.php/emission-calculations.html).

The next step in the process is to convert your project's potential GHG emissions into carbon dioxide equivalents (CO<sub>2</sub>e) as explained below. Use the following table to report your project's GHG data in your EAW. Be sure to replace the example data in the table, with the data from your specific project.

### Example project's GHG emissions

Pollutant	PTE <sup>1</sup> (tons/year)	CO <sub>2</sub> e conversion <sup>2</sup>	CO <sub>2</sub> e <sup>3</sup> (tons/year)
CO <sub>2</sub>	200	1	200
CH <sub>4</sub>	1	21	21
N <sub>2</sub> O	1	310	310
SF <sub>6</sub>	0	23,900	0
HFCs	0	See 40CFR98 <sup>4</sup>	0
PFCs	0	See 40CFR98 <sup>4</sup>	0
GHG Pollutants Total =			531

<sup>1</sup> Project's PTE for each GHG pollutant (use air emissions permit application data)

<sup>2</sup> Pollutant's global warming potential conversion factor (from 40CFR 98, Subp. A, Table A-1)

<sup>3</sup> CO<sub>2</sub>e = Project's PTE for the pollutant multiplied by the pollutant's CO<sub>2</sub>e conversion factor

<sup>4</sup> HFCs and PFCs are classes of chemicals composed of many constituents. To determine the conversion factor for a specific HFC or PFC, go to 40CFR98, Subp. A, Table A-1 (<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=95cee6c84de680777f0378e758db0acb&rgn=div9&view=text&node=40:21.0.1.1.3.1.1.10.11&idno=40>)

## What is a carbon dioxide equivalent?

Greenhouse gases do not all affect the atmosphere to the same extent since each individual GHG has a different potential to warm the environment. To account for this difference, each GHG is normalized against CO<sub>2</sub> using a global warming conversion factor. A one ton CO<sub>2</sub>e emission of a substance is an emission with the same global warming potential over 100 years as the emission of one ton of CO<sub>2</sub> derived from fossil fuel.

## Do I have to report biogenic GHG emissions in the EAW?

Yes, all biogenic (meaning that it was recently contained in living organic matter) GHG emissions must be reported in the EAW. However, if you were allowed to exclude biogenic GHG emissions from your air permit applicability analysis, you can list these GHG emissions separate from the GHG table in the EAW.

## Part 2 - Environmental Impact Statements

### What GHG information goes in an EIS?

The content of an EIS is case specific and may require a more detailed GHG emissions analysis than an EAW. It is not possible to pre-determine what GHG information may be required in an EIS. Before an EIS is prepared, it goes through a scoping process to ensure that the EIS only addresses impacts which are relevant and important for a project. The scoping process determines what GHG information is required for your project's EIS.

The following list provides examples of the types of information that *might be* in an EIS:

- **Direct GHG emissions** – The same GHG emissions information that is required for projects going through the EAW process (see Part 1 of this document).
- **Indirect GHG emissions from energy consumption** – Information on the mass of GHG emissions that are associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.
- **Other indirect GHG emissions** – Information on such as upstream and downstream emissions, emissions resulting from the extraction and production of purchased materials and fuels, transport related activities in vehicles not owned or controlled by the reporting entity (e.g., employee commuting and business travel), use of sold products and services, outsourced activities, recycling of used products, waste disposal, etc.).
- **Alternatives analysis** – Information on the amount of GHG emissions from the project for several alternatives (e.g. alternative energy source, alternative process technology, etc.).

### Where can I find additional information regarding GHGs?

The Climate Registry, of which the state of Minnesota is a founding member, has a GHG reporting protocol document which contains information on reporting GHG gases. This document can be found at: [www.theclimateregistry.org/downloads/GRP.pdf](http://www.theclimateregistry.org/downloads/GRP.pdf).