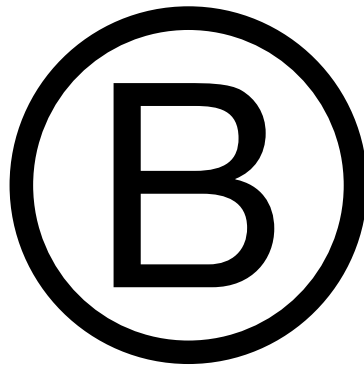


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B Resource Guide:

Calculating Greenhouse Gas Emissions



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What's in this Guide:

- I. Definition: What are Greenhouse Gas (GHG) Emissions?
- II. Why Calculate GHGs?
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I. Definition: What are Greenhouse Gas (GHG) Emissions? ¹

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs). Some GHGs such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are: Carbon dioxide, methane, nitrous oxide and fluorinated gases. ²

II. Why Calculate GHGs? ³

Calculating your GHG's allows you to:

- **Identify opportunities for cost and energy savings.** Greenhouse gas emissions are closely linked to energy use, so measuring emissions can lead to identifying ways to reduce emissions, which can in turn lead to cost savings.
- **Ensure the company is functioning within regulatory requirements.** Accurate measurements, based on commonly agreed-upon standards, are a necessary first step towards such emissions trading and other regulatory changes. As government protocols emerge and develop, it becomes increasingly important for businesses to be aware of their emissions levels. You can read more about regulatory requirements for businesses at the EPA website: <http://www.epa.gov/lawsregs/>.
- **Aid protocol development.** By becoming involved, a company can influence protocol development and become familiar with measuring and reporting methods, processes, and issues.

III. How to Calculate your Company's GHGs ⁴

GHG Protocol Tools

<http://www.ghgprotocol.org/calculation-tools>

Calculating emissions is a multi-step process. The Greenhouse Gas Protocol (GHG Protocol) is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage



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greenhouse gas emissions. The GHG Protocol Initiative provides the accounting framework for nearly every GHG standard and program in the world as well as hundreds of GHG inventories prepared by individual companies.

GHG Protocol's toolset enables companies to develop comprehensive and reliable inventories of their GHG emissions. Each tool comprises an Excel workbook and a PDF guidance document. Each PDF provides step-by-step guidance on the use of a tool. Most companies will need to apply more than one tool to cover their emissions.

Stonyfield Farm's Guide to Offsetting Carbon Dioxide Emissions

http://www.stonyfield.com/images/PDFs/Environmental_Cookbook.pdf

In 1997, Stonyfield Farm self-published this guide using itself as a case study. In the guide, they determined the company's carbon footprint, calculated their emissions, reduced emissions and choose offset partners. The guide includes very useful templates as well.

Torrie Smith Associates' Greenhouse Gas Strategy Software

<http://www.torriesmith.com/>

This firm produces software for businesses and industry to help quantify greenhouse gas emission reductions from efficiency improvements, fuel switching, district heating, business travel, and various other measures.

IV. Outsourcing your GHG Assessment

You may end up deciding to hire a consulting firm to determine your company's GHG emissions. Below are some of the industry leaders that can help you with this process

• Clear Carbon Consulting

<http://www.clearcarbonconsulting.com/>

Clear Carbon Consulting Inc. is the first full-service carbon consulting firm dedicated to creating competitive advantage for companies through measuring, mitigating, and managing their greenhouse gas footprints.

• ClimateCHECK

<http://www.climate-check.com/>

ClimateCHECK offers consulting and management solutions to customers for their climate change activities and assertions, including: validation and verification of GHG emissions.

V. What are the next steps after completing your GHG assessment?

After completing your GHG assessment, you can lessen the environmental impact of your business's greenhouse gas emissions in two ways:

I) Reduce your business's greenhouse gas emissions⁵



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Most emissions are costly to your business, but implementing policies and procedures aimed towards reducing these emissions can minimize such costs while still achieving the same operational results. Some simple actions include increasing equipment efficiency, switching to renewable energy, and reducing paper use. Many opportunities to reduce emissions can be found within the company, such as reducing travel, and these can be taken in increments, requiring little or no upfront investment. Larger projects, such as replacing equipment with more efficient models, may take longer to implement. Actions that yield large benefits often require up-front investment and can have long payback periods -- for example, incorporating energy efficiency, natural lighting and shading, and other "green" elements into new buildings as they are built or retrofitted.

2) Offset your Emissions

Carbon offsets generally refer to voluntary acts by individuals or companies that are arranged by commercial or not-for-profit carbon-offset providers. A variety of offset methods are in use — while tree planting was initially a mainstay of carbon offsetting, renewable energy, energy conservation and methane capture offsets have now become increasingly popular.

VI. Helpful Websites

GREENHOUSE GAS EMISSIONS REPORTING

• The Carbon Disclosure Project

<http://www.cdproject.net/>

CDP is a not-for-profit organization aiming to create a lasting relationship between shareholders and corporations regarding the implications for shareholder value and commercial operations presented by climate change. CDP provides a coordinating secretariat for institutional investors with a combined \$4T trillion of assets under management.

• Global Reporting Initiative (GRI)

<http://www.globalreporting.org/>

The international standard (used by over 1200 companies) for corporate reporting on environmental, social and economic performance.

• Climatebiz.com

The Business Resource for Climate Management is a free, web-based resource to help companies of all sizes and sectors understand and address climate change in a way that aligns environmental responsibility with business success. It provides hands-on tools, action steps, and other resources companies can use to understand the underlying issues, assess their climate footprint, and devise and implement a plan to significantly reduce their climate impacts throughout their operations and supply chains.



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EMISSIONS REDUCTION

• **Rocky Mountain Institute**

<http://www.rmi.org/>

RMI is a nonprofit organization that fosters the efficient and restorative use of resources so that companies, governments and organizations are more efficient, make more money, and do less harm to the environment. For more than two decades, Rocky Mountain Institute has been recognized as one of the world's foremost authorities on energy use, supply, policy, and regulation. Their consultants help clients in a variety of industries develop financially and environmentally superior ways to produce, buy, sell, and save energy.

CARBON OFFSETTING

• Learn more about how to offset your company's GHG emissions by consulting our **B Resource Guide: Carbon Offsetting**.

¹ <http://www.epa.gov/climatechange/emissions/index.html>

² Greenhouse Gases in more detail:

Carbon Dioxide (CO₂): Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

Methane (CH₄): Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Nitrous Oxide (N₂O): Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Fluorinated Gases: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases").

³ http://www.climatebiz.com/sections/toolsresources_detail.cfm?LinkAdvID=41909

⁴ <http://www.ghgprotocol.org/>

⁵ http://www.climatebiz.com/sections/backgrounder_detail.cfm?UseKeyword=Reducing%20Emissions