



Sustainability Inside Siemens

Creating a Carbon Emissions Inventory

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Understanding and measuring an organization's environmental impact – measured through carbon emissions – is a key step in creating an actionable sustainability program and plan. This article addresses the critical steps necessary to develop an emissions inventory and track information over time, as well key lessons learned from Siemens experience in creating, managing and reporting our emissions footprint over the past four years.

Today energy efficiency and environmental responsibility have become strategic imperatives for business, government and educational leaders alike. This is being driven by increasing environmental awareness, leadership by colleges and universities and significant action in the government sector.

Measuring carbon emissions allows an organization to understand its environmental impact of its operations and in the community across a range of activities – from electricity use in buildings to airline travel, waste, and transportation. The most common and accepted method is to equate greenhouse gases in terms of carbon dioxide equivalents (CO₂e) for each activity. This ensures that we understand our environmental footprint, but that we also quantify the benefits of emissions reductions through energy efficiency or the use of renewable resources.

Creating an emissions inventory starts with a thorough understanding of both your organization's activities, and how emissions are calculated and classified. Greenhouse gas emissions are classified into three different scopes:

- Scope 1: Direct emissions from activities including onsite generation, use of natural gas, gasoline use from a fleet of vehicles and refrigerants
- Scope 2: Indirect emissions from purchased electricity or district heating and cooling
- Scope 3: Indirect emissions from additional sources associated with transportation (commuting, airline travel), product use and other outsourced activities such as waste disposal or shipping.

Creating a comprehensive inventory requires a significant amount of data and research, especially if the goal is to include Scope 3 emissions. The most critical aspect is to determine how far and how deep any inventory should - and needs - to go. While creating a complete inventory is important, this goal can often over-shadow focusing on emissions reductions from the largest contributors in favor of reporting details. In addition, methodologies for calculating emissions are widely available, including the Greenhouse Gas Protocol for the most wide-ranging calculations, and ENERGY STAR Portfolio Manager to not only benchmark building energy performance, but to calculate emissions based on energy use.

The first step that the Building Technologies Division took to begin our emissions inventory was to assess what the largest components of our emissions were, and to investigate the availability of data for a range of Scope 3 elements. We determined the boundaries of our emissions inventory to include our fleet of vehicles, the energy use from our facilities, whether owned or leased, employee airline travel and emissions associated with parcel shipping. Because of the size of our fleet, we recognized that nearly two-thirds of our emissions were associated with fuel consumption, and one-quarter was associated with energy use in our facilities. In addition, we determined that we would exclude certain Scope 3 emissions such as employee commuting, and include others based on both data availability and importance to our business model.

There are a number of key lessons learned from our experience as we set out to create a relevant and lasting emissions inventory. Some of these include:

- Set organizational boundaries and scope that best reflect your organization's business.
- Do not spend significant time or resources tracking down scope three emissions where data is challenging to obtain and ongoing measurement is difficult, as long as the expected emissions contribution is not significant.
- Set in place a process to continually gather information and track progress. If information is not available for potentially large contributions, spend the time to develop the methodology and put the tracking and data gathering mechanisms in place.
- Focus on emissions reductions and measuring the impact. This can include energy efficiency efforts, but also renewable energy and Renewable Energy Credits (RECs).

Finally, remember that sustainability is a journey, and that the ability to develop, maintain and report your emissions inventory is the cornerstone of any successful program.