

Carbon Footprint Basics for Safe and Secure Truck Parking Areas (SSTPAs) (According to GHG Protocol)

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1 Introduction

Combating global warming and climate change are key to sustainable development. Thus, companies and truck parking areas need to understand and manage their risks and opportunities in connection to greenhouse gases to ensure their long-term success and be prepared for future developments and to take adequate measures to improve their green credentials and performances.

A carbon footprint summarizes the greenhouse gas emissions of a company, in this case truck parking areas. The document outlines the methodical approach to achieve a carbon footprint. In this case, only the operating phase of the parking area is looked at, not the construction of a parking.

A carbon footprint according to the Greenhouse Gas (GHG) Protocol¹ covers greenhouse gases that are part of the Kyoto Protocol². These gases are converted into CO₂ equivalents (CO₂e) (see also Glossary, p. 4).

1.1 Process Description to calculate the carbon footprint of a truck parking area

To generate the carbon footprint of a parking area, the following steps are conducted:

I. Goal definition

Definition of the carbon footprint calculation boundary and the approach to include subsidiaries while taking the different emissions scopes into account and selecting which scope categories to include into the definition (e.g. only scope 1 and 2 or additional scope 3 categories).

II. Data collection

Joint definition of necessary data, collecting all data bases and screening data containing documents.

III. Emission Calculation

Calculation of carbon footprint including documentation of methodology and data sources used.

1.2 Background: The Greenhouse Gas (GHG) Protocol

The Greenhouse Gas Protocol¹ defines

The Greenhouse Gas (GHG) Protocol Initiative is a multi-stakeholder partnership, which brought together governments, NGOs, and businesses. These stakeholders were convened in 1998 by the World Resources Institute (WRI), a U.S.-based environmental NGO, and the World Business Council for sustainable development (WBCSD). The initiative established a greenhouse gas accounting and reporting standard for businesses, which is today broadly applied and internationally accepted.

three scopes, along which greenhouse gas emissions can be categorized. This is done to differentiate direct and indirect emissions from each other and to allocate them to their sources. Furthermore, this way of greenhouse gas accounting improves transparency for stakeholders. There are three so-called “scopes” in which we categorize emissions: Scope 1 includes all direct greenhouse gas emissions, while Scope 2 and 3 cover different types of indirect greenhouse gas emissions.

1.2.1 Scope 1

Scope 1 emissions cover all direct greenhouse gas emissions, which are

emitted due to the company's own business, i.e., due to the usage of primary energy sources, and emissions, which result from the upkeep of a building (heating with natural gas or oil, use of refrigerants). Also, emissions from the parking's owned cars belong to Scope 1. Thus, in practice, the following emission sources shall be accounted in Scope 1:

- Buildings (e.g., heating systems),
- Vehicle fleet (fuel-powered vehicles – owned or leased),
- Refrigerants

If there is no building and no owned or leased vehicles, there might not be any emissions to be accounted for in this scope.

1.2.2 Scope 2

Scope 2 emissions cover all indirect greenhouse gas emissions, which result from purchased energy that is generated off-site, e.g., electricity or heat. Some examples for emissions, which are covered by Scope 2 are:

- Power supply (e.g., electricity),
- District heating,
- Vehicle fleet (electric vehicles – owned or leased).

1.2.3 Scope 3

Scope 3 emissions cover all other indirect emissions, which are caused during business conduct and the life cycles of the produced goods or services offered. These indirect emissions can be assigned to upstream and downstream processes. Some examples of these emission sources are listed below:

- Waste,
- Water consumption,
- Purchased goods and services, e.g., cleaning services

- Use of sold products (e.g. fuel sold at petrol station belonging to the truck parking area).

2 Calculating the Truck Parking Area Carbon Footprint

2.1 Methodology

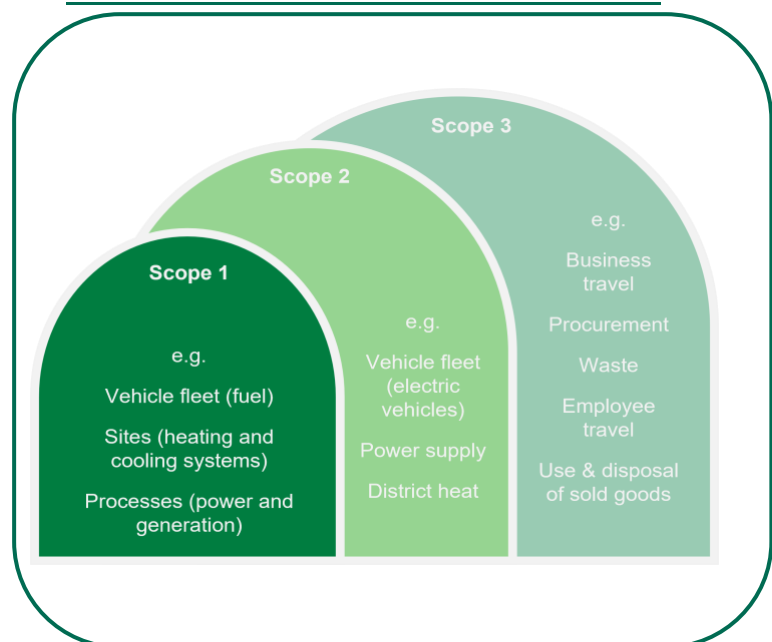


Figure 1: The three scopes of the Greenhouse Gas Protocol incl. examples

The greenhouse gas emissions associated with a truck parking area are determined in accordance with the Greenhouse Gas Protocol¹, "A Corporate Accounting and Reporting Standard".

To calculate the emissions, the data collected on electricity consumption and other activities are multiplied by specific emission factors. The respective emission factors depend on the carbon content of the purchased electricity, or the action conducted.

Example: $15,056 \text{ kWh} \times 0.267 \text{ gCO}_2\text{e/kWh} = 4,02 \text{ gCO}_2\text{e}$.

The emissions are assigned to the three defined scopes. In this way, it is possible to

subsequently analyze in which part of the truck parking area related activities the emissions occur.

2.2 Data Base

In general, data can be divided into primary and secondary sources. Primary sources are all source data provided directly by the parking, e.g. invoice from electricity purchase including the annual energy consumption. Secondary information, on the other hand, usually refers to recognized statistics and are usually not used for scope 1 and 2 calculation. The emission factors used must always be based on a recognized and verifiable database with local or factual reference data.

3 Glossary

CO₂ equivalent or CO₂e is the universal unit of measurement for indicating the global warming potential of greenhouse gases, expressed as the global warming potential of one unit of carbon dioxide. This conversion is made because there are several greenhouse gases that contribute to climate change. The Kyoto Protocol greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).

4 References

¹ World Resources Institute and World Business Council on Sustainable Development (2004). *The Greenhouse Gas Protocol - A Corporate Accounting and Reporting Standard (revised edition)*. Available at: <https://ghgprotocol.org/corporate-standard>

² United Nations (1998). *Kyoto Protocol to the United Nations Framework Convention on Climate Change*. Available at: <https://unfccc.int/resource/docs/convkp/kpeng.pdf>



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