

GUIDELINES FOR THE GREENHOUSE GAS EMISSIONS INVENTORY

The greenhouse gas (GHG) emissions inventory is a way to identify emission sources and quantify them for a specific activity. If measured regularly, the inventory can be used as a management tool, allowing the company to have visibility & control of their GHG emissions. According to the GHG Protocol Corporate Standard, a global reference on the subject:

“A well-designed and maintained corporate GHG inventory can serve several business goals, including:

- *Managing GHG risks and identifying reduction opportunities*
- *Public reporting and participation in voluntary GHG programs*
- *Participating in mandatory reporting programs*
- *Participating in GHG markets*
- *Recognition for early voluntary action”*

The GHG inventories may include, in addition to GHG emissions, removals by carbon sinks - such as carbon capture and storage (CCS).

Today, the internationally used methodology to quantify GHG emissions is the GHG Protocol¹. This methodology is consistent with the norms of the International Organization for Standardization (ISO) and the Intergovernmental Panel on Climate Change (IPCC)². The guidelines set by IPCC, "IPCC Guidelines for National Greenhouse Gas Inventories", provide estimations & methodologies for GHG emissions and removal. The document IPCC Guidelines 2006 is the most current version available, at this moment.

The GHG Protocol's methodology establishes the guidelines for: the inventory development; identification of emission sources and greenhouse gases that should be measured and reported³ and defines the principles of relevance, completeness, consistency, transparency and accuracy that an inventory should contain.

This methodology also includes setting the boundaries for GHG emissions accountability, considering geographical, organizational and operational limits.

Regarding organizational boundaries on the GHG Protocol:

“For corporate reporting, two distinct approaches can be used to consolidate GHG emissions: the equity share and the control approaches.

Under the equity share approach, a company accounts for GHG emissions from operations according to its share of equity in the operation.

Under the control approach, a company accounts for 100 percent of the GHG emissions from operations over which it has control.”

After a company has determined its organizational boundaries in terms of the operations that it owns or controls, it then sets its operational boundaries. This involves identifying emissions associated with its operations, categorizing them as direct and indirect emissions, and choosing the scope of accounting and reporting for indirect emissions.

¹ The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard was launched in 1998 by World Resources Institute (WRI) associated with World Business Council for Sustainable Development (WBCSD).

² O IPCC, Intergovernmental Panel on Climate Change, is a scientific organization leader in climatic subjects, established by United Nations Environment Program – UNEP – and by World Meteorological Organization – WMO. IPCC aims to provide a scientific view based on the review of climate change's reports and its potential environmental and socioeconomic consequences.

³ Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Sulfur hexafluoride (SF₆), Hidrofluorcarbons (HFCs), Perfluorcarbons (PFCs). For more details, access: <http://www.ghgprotocol.org/standards/corporate-standard>

The concepts of scopes 1, 2 and 3 are explained below:

a) **Scope 1 – Direct emissions:** GHG emissions from owned (Shareholding approach) or controlled (Operational control approach) sources by the company. The quantification of Scope 1 emissions is considered mandatory by the GHG Protocol.

b) **Scope 2 – Indirect Emissions:** GHG emissions derived from the purchase of electricity (Electrical network or Steam). As the company does not hold the operational control over the generation of energy, such emissions, allocated under the scope 2, are considered indirect. The quantification of Scope 2 emissions is also considered mandatory by the GHG Protocol.

c) **Scope 3 – Other indirect emissions:** GHG emissions that occur along the value chain. More specifically, this scope cover the emission of extraction and production of raw materials, transportation of employees, emissions related to end use of products, employee travel, freight etc. The quantification of Scope 3 emissions considered voluntary by the GHG Protocol.

Together the three scopes provide a comprehensive accounting framework for managing and reducing direct and indirect emissions.

In order to minimize the discrepancies between the scopes of corporate inventories, the GHG Protocol, launched in October 2011, a new documents aimed to standardize emissions' calculation for the companies' value chain, "The Corporate Value Chain (Scope 3) Accounting and Reporting Standard" which allows the companies to understand the emissions of their value chain, identifying the best way to reduce them, and finally establishes criteria for inclusion or exclusion of certain sources.

References:

GHG Standard Protocol: <http://www.ghgprotocol.org/standards/corporate-standard>

Corporate Value Chain (Scope 3) Accounting and Reporting Standard:
<http://www.ghgprotocol.org/standards/scope-3-standard>

IPCC: <http://www.ipcc.ch/>

IPCC Guidelines 2006: <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>