

## A Brief Discussion on Greenhouse Gas Accounting Methods

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Since the concepts of environmental protection and sustainable development were proposed in the 1950s, greenhouse gas (GHG), responsible for global warming, has been put in the world's spotlight. Today, curbing the continued deterioration of climate has become a critical challenge facing the whole world. Accurate measurement of GHG emissions turns out to be a necessary step to realize the goal of “limiting global warming to below 2 degrees Celsius” set out in the Paris Agreement and China's goal to peak carbon emissions before 2030 and achieve carbon neutrality by 2060 (hereinafter referred to as “the dual carbon goal”). The Greenhouse Gas Protocol (GHG Protocol) is currently an internationally accepted standard framework, jointly formulated by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) in 1998. It consists of a series of independent and interlinked standards, systems, and guidelines, the most important ones of which are the Corporate Standard, the Corporate Value Chain (Scope 3) Standard, and the Product Life Cycle Standard. This paper will focus on illustrating the first two standards, which are of great interest to financial institutions, and then explain how financial institutions perform Scope 3 accounting.

### I. Corporate Standard

The GHG Protocol Corporate Accounting and Reporting Standard (Corporate Standard) is a host of standardized methodologies used to quantify and report the GHG emissions (emissions) at the level of enterprise or institution. Also as the first guiding standard established by the GHG Protocol, it sets up an overall framework that covers various aspects of corporate emission accounting such as definitions, rules, scopes, boundaries, principles, and methods. Below is a brief introduction to the major aspects of the Corporate Standard.

#### i. Emissions

GHG emissions are the six major GHGs: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorcarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>), which are covered by the Kyoto Protocol and are included in national lists according to the United Nations Framework Convention on Climate Change. To facilitate accounting, these GHGs are usually converted into CO<sub>2</sub> equivalents.

## **ii. Emission sources**

Emissions of companies typically occur from the following four source categories:

**Stationary combustion:** combustion of fuels in stationary equipment such as boilers, furnaces, burners, turbines, heaters, incinerators, flare towers, etc.

**Mobile combustion:** combustion of fuels in transportation devices such as automobiles, trucks, buses, trains, airplanes, boats, ships, barges, vessels, etc.

**Process emissions:** emissions from physical or chemical processes such as CO<sub>2</sub> from the calcination step in cement manufacturing, CO<sub>2</sub> from catalytic cracking in petrochemical processing, PFC emissions from aluminum smelting, etc.

**Fugitive emissions:** intentional and unintentional releases such as equipment leaks from joints, seals, packing, gaskets, as well as fugitive emissions from coal piles, wastewater treatment, pits, cooling towers, gas processing facilities, etc.

## **iii. Organizational boundaries**

Business operations vary in their legal and organizational structures, including wholly-owned operations, incorporated and non-incorporated joint ventures, subsidiaries, and others. For the purpose of emission accounting, the first thing for a company to do is to draw boundaries of emission-releasing activities, a prerequisite for accounting and reporting the consolidated GHG data. Two approaches are set out in the Corporate Standard.

**The equity share approach:** Under this approach, a company accounts for GHG emissions from an operation according to its share of equity in the operation. Typically, the share of economic risks and rewards in an operation is aligned with the company's percentage ownership of that operation, and the equity share will normally be the same as the ownership percentage.

**The control approach:** Under this approach, a company accounts for 100 percent of

the GHG emissions from operations over which it has control. It does not account for GHG emissions from operations in which it owns an interest but has no control. Control can be further divided into financial control and operational control. **Financial control** means a company has the ability to direct its financial policies or retains the majority of risks and rewards of ownership of the operation's assets. **Operational control** means a company or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation.

Regardless of which form is adopted, the economic substance of the relationship the company has within the operation always overrides the legal ownership form.

#### **iv. Operational boundaries**

After determining the company's organizational boundaries, it is necessary to identify the scope of emissions associated with its activities within the boundaries. In the Corporate Standard, the emissions accounted for and reported are divided into two categories: direct emissions and indirect emissions. On this basis, three scopes are defined according to the emission sources and the value chain of the company that releases emissions.

##### **Scope 1: direct GHG emissions**

Direct emissions come from the sources a company directly controls or owns, such as the GHGs from the combustion of fuels in boilers, furnaces, vehicles, and others owned or controlled by the company. GHG emissions not covered by the Kyoto Protocol, e.g. CFCs, NO<sub>x</sub>, etc. shall not be included in scope 1 but may be reported separately.

##### **Scope 2: electricity indirect GHG emissions**

Indirect emissions come from the purchased and consumed electricity, steam, heating, or cooling services for a company's own use. For many companies, purchased electricity is one of their largest emission sources.

##### **Scope 3: other indirect GHG emissions**

Scope 3 covers all other indirect emissions of a company outside of Scope 2, which can be broken down into upstream emissions that occur along the supply chain (e.g., extraction, production, and transportation of raw materials) and downstream emissions that occur as a result of the products or services used.

## **II. Corporate Value Chain (Scope 3) Standard**

Reporting Scope 3 emissions is optional, because these emissions come from sources not under the direct control of companies. But this does not mean reporting Scope 3 emissions is unnecessary. Upstream and downstream emissions are likely to be greater compared to those within Scope 1 and Scope 2.

The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (Scope 3 Standard) was released in 2011. As an important supplement to the Corporate Standard, it provides a standardized methodology to account for Scope 3 emissions. It explicitly divides the emissions along the value chain into 15 categories.

**Upstream emissions (8 categories):** purchased goods and services, capital goods, fuel- and energy-related activities, upstream transportation and distribution, waste generated in operations, business travel, employee commuting, and upstream leased assets.

**Downstream emissions (7 categories):** downstream transportation and distribution, processing of sold products, use of sold products, end-of-life treatment of sold products, downstream leased assets, franchises, and investments.

### III. Methods Used by Financial Institutions for Accounting for Scope 3 Emissions

For financial institutions, category 15 within Scope 3 covers the emissions of loans and investments (hereinafter referred to as “financed emissions” collectively). It usually takes up the most important part of their list of GHG emissions. In 2020, the Partnership for Carbon Accounting Financials (PCAF) published the Global GHG Accounting and Reporting Standard for the Financial Industry, which provides a transparent and consistent way for financial institutions to account for their financed emissions.

#### i. Emission categories

Financial institutions can measure emissions according to the following three categories.

**Absolute emissions:** Total institutional and financed emissions in an absolute term are commonly referred to as absolute emissions. This is an emission category that financial institutions are required to report.

**Emission removals:** Some loans and investments may be accompanied by emission reduction activities, and the CO<sub>2</sub> absorbed can be considered as emission removals.

**Avoided emissions:** Project-specific loans and investments in renewable energy projects can result in emissions being avoided as they displace the emissions that normally would

have been accessed without the project's implementation.

Reporting on emission removals and avoided emissions, capable of contributing to decarbonization, shall always be done separately from the financial institutions' Scopes 1, 2, and 3 GHG inventories.

## **ii. Reporting requirements**

### **1. Adopt the control approach**

As financial institutions' investments in equity or debt are typically not intended to hold a controlling interest, they are required to measure and report their GHG emissions using the control approach.

### **2. Track capital flows**

Financial institutions shall track the flows of funds in loans and investments to the extent possible in order to understand and account for the climate impact of project-specific emissions in the real economy.

### **3. Six asset classes**

Financial institutions shall disclose the absolute emissions from each of six asset classes, including listed equity and corporate bonds, business loans and unlisted equity, project finance, commercial real estate, mortgages, and motor vehicle loans, as well as the percentage of total loans and investments covered in their financed emissions inventories for each asset class.

## **iii. Accounting approaches**

### **1. Attribution factor**

Emissions from loans and investments should be allocated to the reporting financial institutions based on the proportional share of lending or investment in the borrower or investee. The allocation ratio is defined as the attribution factor, and it is the share of the outstanding amount of loans or investments of a financial institution over the total equity and debt of enterprises, projects, etc. By using the correct attribution method, financial institutions can reduce double counting of emissions since upstream and downstream enterprises account for the same activity within different scopes.

### **2. Key metrics measuring emissions intensity**

Given that financial institutions may vary in terms of size, product portfolios, industries, regional risk exposures, etc., absolute emissions need to be converted into emissions intensity metrics (i.e. emissions per specific unit) in order to maintain comparability and benchmark setting. Below are some commonly used key metrics.

**Economic emissions intensity:** absolute emissions divided by the loan and investment volume; to understand how emissions intensities of different portfolios compare to each monetary unit.

**Physical emissions intensity:** absolute emissions divided by an output value; to understand the efficiency of a portfolio in terms of total emissions per unit of a common output.

**Weighted average carbon intensity (WACI):** absolute emissions divided by a company's revenues; to understand a portfolio's risk exposure to carbon-intensive companies.

### **3. Data quality**

There is often a lag between financial reporting and required data. In these instances, financial institutions should use the most recent data available even if it is representative of different years. For example, it would be expected and appropriate that a financial institution's reporting in 2021 for its 2020 financial year would use 2020 financial data along with 2019 emissions data. Financial institutions need to be clear about the sources, types, timeliness, assumptions, and interpretations of the data, which is the prerequisite for reviewing the accuracy of emissions accounting.

(Published by the *CCB Journal* on November 12, 2021)