

CDP full GHG emissions dataset

Technical Annex II: Physical Activity Modelling
Primer



Contents

1 Introduction	1
2 Method	2
3 Model framework.....	2
4 Data sources and granularity.....	3

1 Introduction

The Full GHG Emissions Dataset provides CDP's investor members and other stakeholders with the most up-to-date, accurate and comparable corporate GHG emissions and energy-use data. This is one of a series of documents outlining how the raw reported data is enhanced. All are available on [CDP's website](#).

- ▼ CDP Full GHG Emissions Dataset: Summary 2023
- ▼ Technical Annex I: Data Cleaning Approach
- ▼ Technical Annex II: Physical Activity Modelling Primer
- ▼ Technical Annex III: Statistical Framework
- ▼ Technical Annex IV: Scope 3 Overview and Modelling

Physical activity modelled estimation is based on the combination of physical activity measures (tonnes, barrels, etc.) and their associated emission factors. Because such indicators relate directly to the emitting activity, the estimates are expected to have a narrower margin of error than the statistical estimates. Activities and products are accounted for individually, so the method is limited to homogenous sectors. Homogenous sectors are so-called because they are structured around one, or a low number of, processes and products. Such structures are most common in the upstream extraction, production and conversion industries, which is why the method accounts for the most energy- and emissions-intensive sectors. Four homogenous sectors are modelled for emissions estimation, and these are displayed in the table below.

Sector activity	Data input granularity	Estimated data points
Coal mining	Asset-level (mines)	S1, S3c11 (Use of Sold Products)
Oil and gas extraction	Asset-level (fields)	S1, S3c11 (Use of Sold Products)
Petroleum refining	Company production	S1, S3c11 (Use of Sold Products)
Electric power generation	Company production	S1, S3c03 (Fuel- and Energy-Related Activities) Not Included in Scope 1 or Scope 2)

2 Method

The generalized methodological approach is detailed in the IPCC (2006c) 'Guidelines for National Greenhouse Gas Inventories' and is described by Equation (1):

$$\text{Emissions} = \text{Activity data} \cdot \text{Emission factor} \quad (1)$$

The level of methodological complexity is represented by three tiers: tier 1 (basic), tier 2 (intermediate), and tier 3 (advanced). Tier 1 is generally designed for the application of readily available, or aggregate, company activity data with default emission factors, which are available, for example, from IPCC default parameter tables. Tier 2 and tier 3 are designed for the use of more granular activity data and emission factors and for a wider inclusion of process parameters. Tier 2 and tier 3 are referred to as higher tier methods. The analyses undertaken for estimation within the Full GHG Dataset are of tier 1 or tier 2 complexity.

3 Model framework

The physical activity estimates are modelled using either asset- or company-level production data. The data and estimation models, therefore, are built to reflect this (see figure 1 to view the model's general arrangement diagram). As depicted in Figure 1, the model, is divided into a series of sequential steps starting from raw data input and ending in desired estimated output. Preparing and standardizing data inputs before the analysis stage is paramount to enabling modelling coefficients to be applied within sectors.

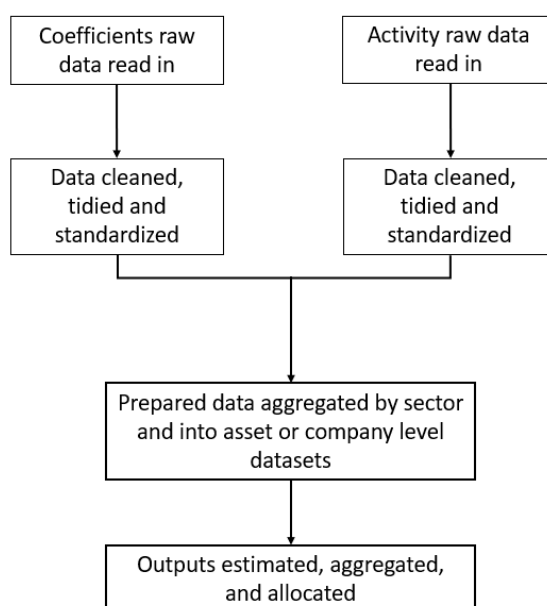


Figure 1 – General process of the physical activity modelling approach

4 Data sources and granularity

Activity data is either purchased from third party data providers, compiled from open-source datasets published by organizations such as GEM and the IEA, or collected from company reports. The collected data is sourced directly from annual, operational, sustainability, and integrated reports published on company websites. Further data is retrieved from public company filings. All sources are updated annually.