COMMON CARBON METRIC

Global Measurement and Reporting of Energy Use and Greenhouse Gas Emissions

About

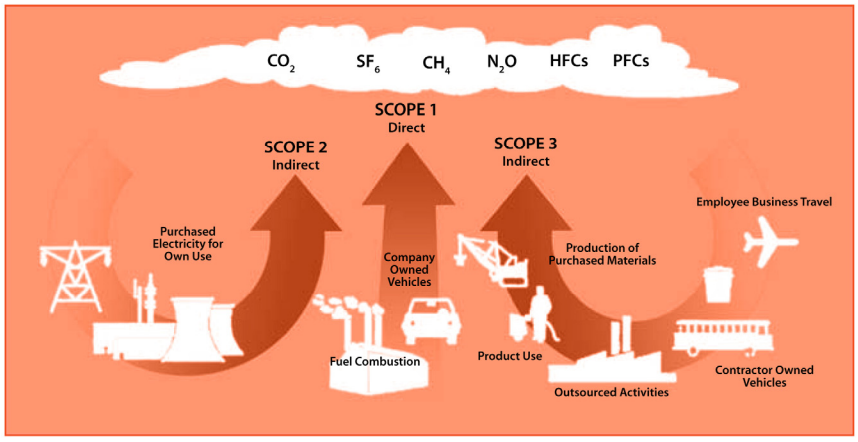
The Common Carbon Metric was officially launched at COP15 in Copenhagen in December 2009. Recognized by the United Nations Environment Program's Sustainable Building and Climate Initiative (UNEP-SBCI), the Common Carbon Metric was introduced to provide globally applicable common metrics for measuring and reporting the energy use in and greenhouse gas (GHG) emissions from existing building operations.

Purpose

Energy efficiency in buildings offers an obvious opportunity for developed and developing countries to partner in achieving significant GHG emissions reductions. Although implementation of energy-efficiency measures in the building industry varies by country, there is an opportunity for country-to-country technology sharing agreements and international capacity building support. To facilitate this technology sharing across different building cultures, climate zones and building types, common metrics are needed for consistent, measurable, reportable and verifiable GHG emissions reductions from buildings.

The Metric

The Common Carbon Metric is the calculation used to define measurement, reporting and verification for GHG emissions associated with the operation of building types in particular climate regions. It does not include value-based interpretation of the measurements, such as weighting or benchmarking. While it is not a building rating tool, it is consistent with methods for assessing the environmental performance of buildings used globally. The Common Carbon Metric focuses on the scope of emissions related to energy use of building operations. Future metrics are required to address other impacts in addition to social and financial impacts.



Scope of Emissions

The Common Carbon Metric may be applied through a top-down or bottom-up approach. Monitoring carbon mitigation measures on a regional or national scale would require a top-down approach while assessing individual building projects would require a bottom-up approach.

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Bottom-Up Approach

Each country shall obtain MRV data on GHG emissions for statistically representative samples of building types. This data may be readily accessible through utility and/or fuel providers. A building inventory requires that buildings be cataloged by location (country, region and municipality) and identified by street address. The inventory can be correlated with a climate region by the number of heating and cooling degree days at its location. Building stock is to be quantified by type:

Residential

- Single family
- Multi-family dwellings

Non-Residential

- Mixed use, excluding industrial buildings

The stock shall additionally be characterized by age (year built), gross floor area and occupancy (if available).

Top-Down Approach

Where GHG emissions reports are required at a regional or national level, estimated performance data for subsets or total building stock should be used and coupled with estimates of building stock characterized by age, building type, gross floor area and occupancy (if available). Where relevant, such aggregated performance data shall be compared with a statistically representative sample set of building performance data (bottom-up) from the same area to verify the accuracy of both data sets. Green Building Councils have an important role in adopting the metrics and offering third-party verification of the top-down approach. It is also critical that other established or newly formed national and international data collections efforts adopt the metrics so that data can be compared easily across the world.

Data Compilation

From the above building performance data, the following metrics should be used to compile consistent and comparable data:

Energy Intensity = $kWh/m^2/year$

Emissions associated with building energy end-use are included, such as purchased electricity, purchased cool/steam/heat and/or on-site generated power used to support building operations. If available, emissions associated with fugitives and refrigerants used in building operations should be reported separately. Additionally, occupancy data should be correlated with the building area to allow Energy Intensity per occupant (o) to be calculated (kWh/o/year).

GHG emissions are calculated by multiplying Energy Intensity by the official GHG emission coefficients for the year of reporting and each fuel source used.

Energy Intensity

$=kWh/m^2/year$

$=kWh/o/year$

Carbon Intensity

$=kgCO_2e/m^2/year$

$=kgCO_2e/o/year$

Carbon Intensity = $kgCO_2e/m^2/year$

GHG conversion factors for each fuel type shall be the same as those under national reporting for flexible mechanisms for the Kyoto Protocol for the six GHG.

This globally harmonized method for energy use and GHG emissions provides the basis for establishing baselines, performance benchmarking and monitoring building performance improvements. These activities are fundamental to inform international mechanisms for carbon trading, policy development and analysis, and progress reporting on the mitigation of GHG emissions from buildings. The data collected through these metrics forms baselines that can be used to set targets and show improvements in carbon mitigation in the building sector.

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