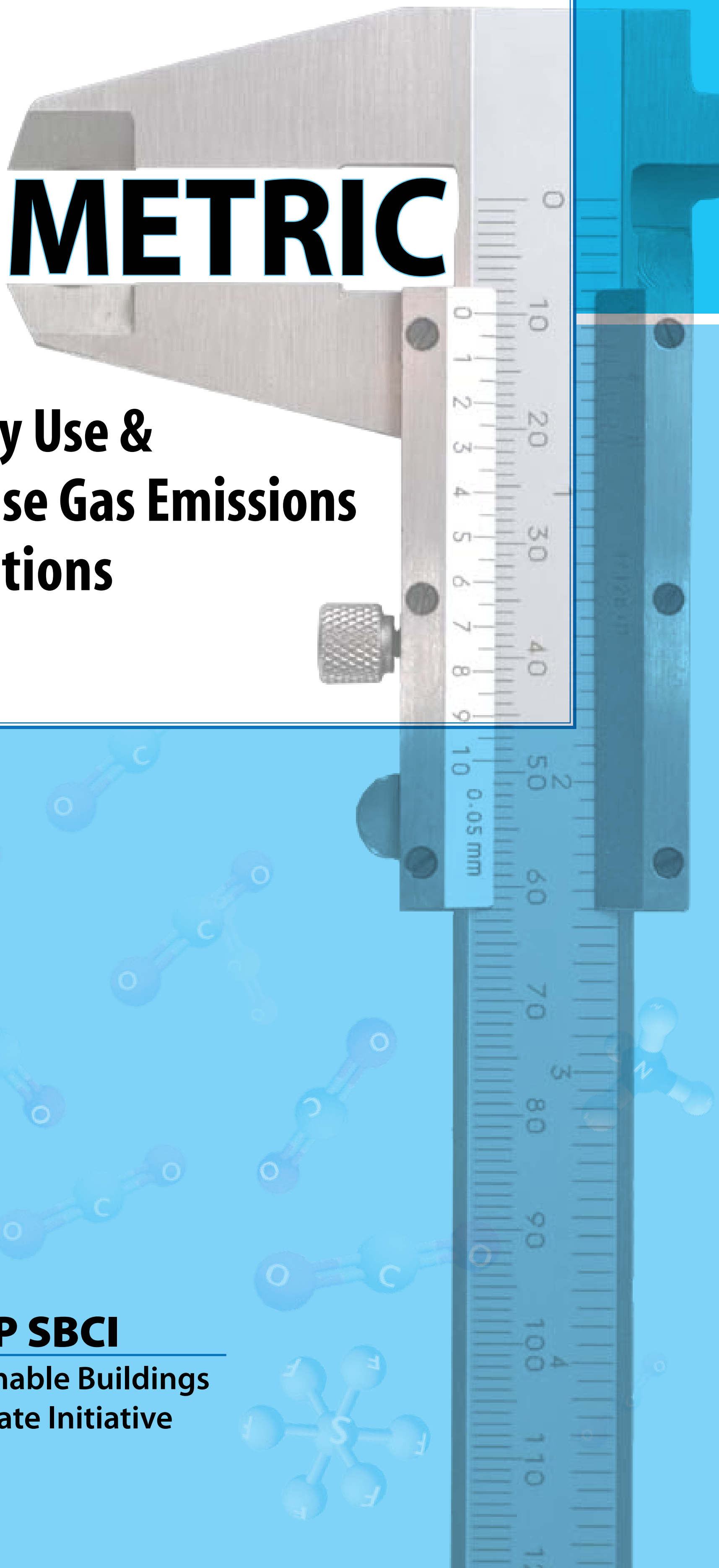
COMMON CARBON METRIC



for Measuring Energy Use & Reporting Greenhouse Gas Emissions from Building Operations

UNEP

UNEP SBCI
Sustainable Buildings
& Climate Initiative

Executive Summary

Leading experts from around the world have, through extensive international cooperation, developed a universal method of measuring a building's carbon footprint.

Supported by the United Nations Environment Program, this new 'Common Carbon Metric' will allow emissions from buildings around the world to be consistently assessed and compared, and improvements measured.

Why buildings?

The purpose of a Common Carbon Metric for buildings is to give the **sector that represents 40% of the world's energy consumption and related 1/3rd of global greenhouse gas (GHG) emissions** a tool that doesn't exist today – a way to measure, report, and verify reductions in a consistent and comparable way. With its high share of emissions the building sector has the responsibility and opportunity to take the global lead in reduction strategies. Awareness of these facts and widespread use of this tool for measuring and reporting **is the key**.

The building sector has more potential to deliver quick, deep and cost effective GHG mitigation than any other. Significantly increasing building energy efficiency can be achieved in the short-term. **Energy consumption in both new and existing buildings could be cut by an estimated 30-50% by 2020** through readily available technologies, design, equipment, management systems, and alternative generation solutions. This can be funded through investments that quickly payback and result in significant environmental, social, and economic benefits. A universal measuring stick for building emissions – a Common Carbon Metric – provides the foundation for accurate performance baselines to be drawn, national targets set, and carbon traded on a level playing field.

> *Success of national carbon reduction targets* relies on the low-hanging fruit offered by the mitigation potential of the building sector to avoid further global warming and severe climate impacts.

What is measured?

While all stages of a building's life-cycle (including construction and demolition) produce carbon emissions, **the building's operational phase accounts for 80-90% of emissions** resulting from energy use mainly for heating, cooling, ventilation, lighting and appliances. Therefore, this is the stage of the building's life-cycle that is the focus of the Common Carbon Metric.

Working in close cooperation, environmental building ratings organisations, local, regional, and national governments, research institutions, industry experts, and private sector stakeholders *(See Acknowledgements)* have developed a common measurement for GHG emissions from building operations that takes two complementary approaches; one assesses performance at the building level (bottom-up), and the other at the regional or national level (top-down).

The actual reporting is done in weight of carbon dioxide equivalent ($kgCO_2e$) emitted per square meter per year = **$kgCO_2e/m^2/year$** (by building type and by climate region).

What happens next?

Stakeholders will continue the development of PROTOCOL to guide implementation of a series of pilot projects to test the Common Carbon Metric. Individual buildings and building stocks will measure emissions from buildings operations over a 12 month period to establish baselines by building type in climate regions.

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Foreword

The Building Sector is:

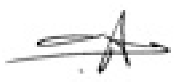
- Collectively responsible for about 30% of total global greenhouse gas (GHG) emissions;
- Collectively has the greatest potential for delivering major reductions in GHG emissions at zero cost or net savings using currently available technology & knowledge; and
- Collectively the largest single industrial employer, with the potential for creating demand for 'green jobs'.

What has been missing is a collective voice from the sector on these issues. Fundamentally we lack a common language for describing the kind of innovation necessary for the building industry to tackle climate change. More specifically we lack a common approach to measuring our baseline GHG emissions and a common approach for reporting on the sector's progress or contribution to achieving emissions reduction targets. Without a common voice, a common language, and a common approach to accounting for emissions, the sector is unable to participate cost effectively in the global carbon market.

UNEP-SBCI is providing a neutral forum for the building sector to come together and develop the common metrics including particularly those stakeholders involved in developing tools and methods for assessing and rating the environmental performance of buildings.

This year is a crucial year for the building sector and the success of the next global protocol on climate change. If we fail to act in a collective and coordinated manner this year, we may indeed fail to effectively address climate change.

UNEP-SBCI will continue to crystallize and amplify the collective voice of the building sector on the need to both further empower the sector, and to promote the sector's demonstrated commitment to lead by example in tackling climate change. UNEP-SBCI will also continue to develop the common ground for measuring emission reductions from buildings. Together we will be more effective in raising awareness and instilling confidence in our national delegations in Copenhagen, that the best chance they have of achieving an effective and profitable global emissions protocol is to seize the opportunity that the building sector can collectively provide.



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Introduction

This paper is offered by the United Nations Environment Program's Sustainable Buildings & Climate Initiative (UNEP-SBCI), a partnership between the UN and public and private stakeholders in the building sector, promoting sustainable building practices globally. The purpose of this proposal for a Common Carbon Metric is to support greenhouse gas (GHG) emissions reductions through accurate measurement of energy efficiency improvements in building operations.

Goal: To provide globally applicable common metrics for measuring and reporting the energy use in and GHG emissions from existing building operations to support international, regional, national, and local policy development and industry initiatives.

Objectives: Develop common metrics for use in gathering consistent data and reporting the climate performance of existing buildings in order to:

- Support policy-making to reduce GHG emissions from buildings, especially in developing countries;
- Provide a framework for how to measure emission reduction in buildings so as to support formulation of Nationally Approved Mitigation Action (NAMA) plans, flexible mechanisms, carbon crediting; and other emission reduction mechanisms and plans; and
- Establish a system of measurable, reportable, and verifiable (MRV) indicators for the follow-up of policy implementation, resulting emission reduction and reporting on building-related GHG emissions.

Users: National, regional, and local governments in developed and developing countries, owners of large building portfolios, and national building rating schemes.

Background

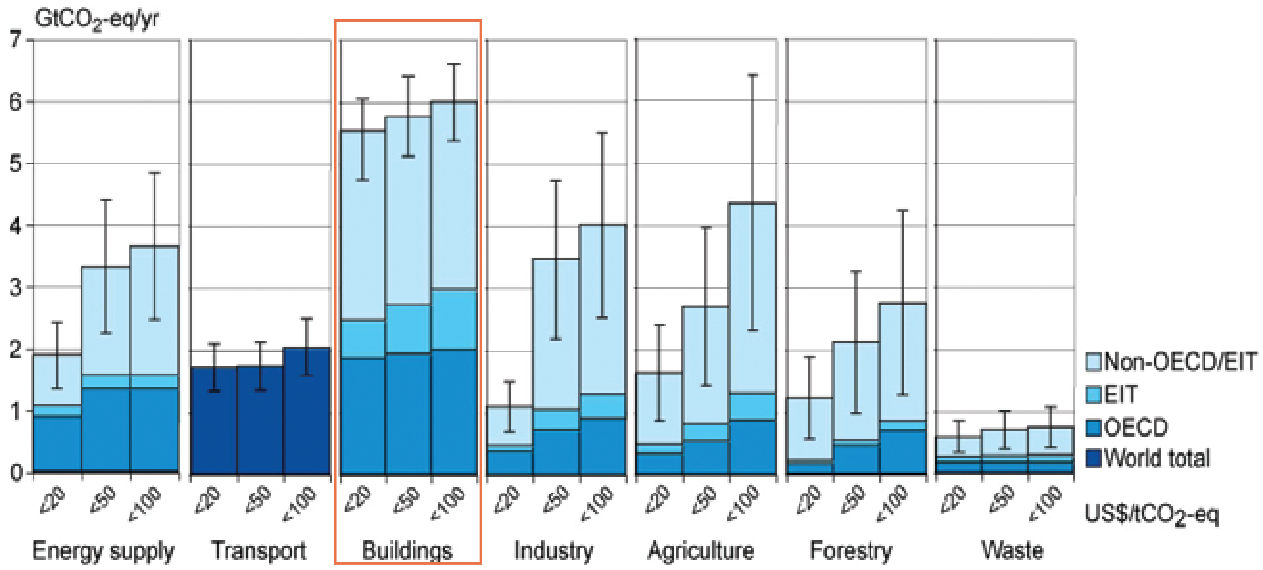
The environmental footprint of the building sector includes; 40% of energy use, 30% raw materials use, 25% of solid waste, 25% water use, and 12% of land use. While this paper focuses on the scope of emissions related to energy use of building operations (See Appendix 1), future metrics are required to address these other impacts in addition to social and financial impacts. **At this time the UN's top priority is climate change and the building sector is responsible for more than one third of global GHG emissions and, in most countries, is the largest emissions source.** While 80-90% of the energy used by the building is consumed during the use (or operational) stage of a building's life-cycle (for heating, cooling, ventilation, lighting, appliances, etc.), the other 10-20% (figure varies according to the life of the building), is consumed during extraction and processing of raw materials, manufacturing of products, construction and demolition. Furthermore, significant energy is used in transporting occupants, goods and services to and from the building.

The Intergovernmental Panel on Climate Change's 4th Assessment Report (IPCC AR-4) estimated that building-related GHG emissions reached 8.6 billion metric tons (t) CO_2equivalent (e) in 2004, and could nearly double by 2030, reaching 15.6 billion tCO_2e under their high-growth scenario. The report further concluded that **the building sector has the largest potential for reducing GHG emissions and is relatively independent of the price of carbon reduction (cost per tCO_2e) applied. With proven and commercially available technologies, the energy consumption in both new and existing buildings can be cut by an estimated 30-50% without significantly increasing investment costs.** Energy savings can be achieved through a range of measures including smart design, improved insulation, low-energy appliances, high efficiency ventilation and heating/cooling systems, and conservation behavior by building occupants.

The diagram from IPCC AR-4 below indicates that the significant potential for energy efficiency improvements and GHG emissions reductions from buildings is common among developed and developing countries, as well as in economies in transition. Regardless of the price placed on carbon, be it US$20, 50, or 100, buildings offer the greatest potential for emissions reductions over all other sectors.

Construction, renovation, and maintenance of buildings are significant economic activities **contributing 10 - 40% of countries' Gross Domestic Product (GDP) and representing on a global average 10% of country-level employment**, 74% of which are in developing countries and 90% of which are with firms of fewer than ten people. The UNEP-International Labor Organization (ILO) report Green Jobs: Towards decent work in a sustainable low-carbon world (2008), reports that measures improving energy efficiency in buildings lead to direct, indirect, and induced jobs created directly in the real-estate and construction sectors.

IPCC AR-4 {WGIII Figure SPM.6}: Estimated economic mitigation potential by sector and region using technologies and practices expected to be available in 2030. The potentials do not include non-technical options such as lifestyle changes. Note: Organization for Economic Cooperation and Development (OECD) and Economies in Transition (EIT).



Purpose

The Bali Action Plan, paragraph 1, calls for measurable, reportable and verifiable NAMAs. All emissions scenarios used by IPCC AR-4 in modeling how to stabilize the concentration of GHG in the atmosphere below 450ppm CO_2e, assumed high levels of energy efficiency across the sectors. Energy efficiency in buildings offers an obvious opportunity for developed and developing countries to cooperate in achieving common but differentiated action to realize significant GHG emissions reductions. **The enabling conditions already exist:**

> A registry of NAMA by all developing countries should be established, supported and enabled by developed countries through the provision of the means of implementation (technology, financing and capacity-building) to developing countries in a MRV manner in order to develop policy packages that promote emissions reductions in buildings under NAMA. ***These policy packages require the development of common indicators and metrics to report on emissions from buildings and to establish national baselines to enable reporting of achieved emission reductions.***
>
> **UNFCCC Bali Action Plan**

- **POTENTIAL for large GHG emissions reductions in buildings *exists* in all countries.**

- **OPPORTUNITY for country-to-country technology sharing agreements and international capacity building support *exists* and is wide spread** because the level of implementation of energy efficiency measures of the building industry is at different stages in different countries.

- **COMMON METRICS now *exist* to facilitate the technology sharing across different building cultures, climate zones and building types. These are needed for consistent, measurable, reportable and verifiable GHG emissions reductions from buildings. These metrics can be applied** to measure energy use in individual buildings or groups of buildings and converted to CO_2e through emission factors. They are also the basis for monitoring emissions mitigation on regional and global scales.

- **TECHNOLOGIES *exist*, are proven and commercially available**. Transfer of technologies is facilitated through greater understanding, accuracy, and consistency of building performance measurements.

- **FINANCING for energy efficiency improvements in buildings *exists* and can, to a large part, be offset by reduced energy costs of building operations.** Additionally, a concerted approach to investments in energy efficient buildings would support a broader shift towards a low carbon society.

- **BENEFITS of energy efficient buildings *exist* and not only reduce GHG emissions but also support other national sustainable development priorities**. Benefits include: employment generation and upgrading of skills in the existing workforce; provision of more sustainable, affordable and healthy buildings; and improved energy security through reduced overall energy demand. **International technology transfer agreements and support to national capacity building would provide additional incentives for developing countries to undertake energy efficiency in the building sector.**

The challenge is therefore to design mechanisms that will redirect the economic savings associated with emissions reductions in buildings to offset the increased investment costs for energy emissions reductions measures. *This may take the form of three basic models:*

1. **Establish an investment fund for energy efficiency in buildings**. This fund would be used to support additional initial investment costs for energy efficiency in buildings and could be financed through levies of energy use above the ***national average or baseline*** for that particular building type in the country. In this way, the fund would provide additional incentive for reductions among high energy users. This fund could also be financed by redirecting investments in increased energy production avoided by reduced energy demand in buildings. Such a fund could also be supported with seed financing provided under NAMA.

2. **Establish national regulation** that makes energy efficiency investments mandatory in new buildings and renovations of existing buildings. Additional investment costs would no longer be optional and would be carried forward from the investment phase to the use phase in the form of increased building costs. These initial costs would be offset by reduced operational costs.

3. **Allow Cap-and-Trade** of emission reductions from buildings. The funds generated by selling Certified Emission Reductions (CER) could be used to finance investments in emission reduction measures. CER are generated from building projects under the Clean Development Mechanism (CDM) but, due to the fragmentation of the sector and the technology specific focus of CDM, only a handful of building projects have generated CER. With common metrics for assessing GHG emissions from buildings, cap and trade schemes, based on the performance of buildings, could be established.

The above actions require active intervention of policy- and decision-makers, as well as defined standards and definitions for energy efficiency in buildings to underpin these actions. Policy instruments/mechanisms and political understanding and will are needed to harness this opportunity, which must rely on measureable, reportable, and verifiable GHG emissions inventories. Therefore nations must include specific accounting of the building sector's energy and carbon intensities.

The Metric

The Metric

The Common Carbon Metric is the calculation used to define measurement, reporting, and verification for GHG emissions associated with the operation of buildings types of particular climate regions. It does not include value-based interpretation of the measurements such as weightings or benchmarking. While it is not a building rating tool, it is consistent with methods for assessing the environmental performance of buildings used globally such as the World Business Council for Sustainable Development (WBCSD), World Resources Institute (WRI) GHG Protocol, and International Standards Organization (ISO) 15392:2008 Sustainability in Building Construction and general principles of ISO 14040/44:2006 on Life Cycle Assessment.

The Common Carbon Metric is applied to the specific inventory of the buildings under study. Such an inventory can be developed from a top-down or bottom-up approach, depending on the scope and goal of the investigation. 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 (*See Appendix 2*).

Bottom-up approach

Each country shall obtain MRV data on GHG emissions for statistically representative samples of building types. These data may be readily accessible through utility and/or fuel providers. A building inventory requires that buildings be cataloged by location (country, region, municipality) and identified by street address. The inventory can be correlated with a climate region by the number of heating and cooling degree days of its location. Building stock is to be quantified by type: 1) residential (a) single-family and (b) multi-family dwellings, and 2) non-residential (including mixed use and excluding industrial buildings). The stock shall additionally be characterized by age (year built), gross floor area, and occupancy (if available).

Where measurable statistical sampling is not possible or feasible, average or generic data can be used if it is representative of the subject building type, technologies, and construction techniques and of systems common to the reporting region. Representative sample data can be scaled up or aggregated to the portfolio at the local, regional, or even national level using relevant statistics of the building stock to verify accuracy of the top-down approach.

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. (See Appendix 2) Green Building Councils have an important role in adopting the metrics and offering 3rd party verification of the top-down approach. It is also critical that other established or newly forming national and international data collections efforts adopt the metrics so that data can be compared easily across the world.

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

Energy Intensity = kWh/m²/year (*kilo Watt hours per square meter per year*)

Scope: Emissions associated with building energy end-use defined in Appendix 1 are included; purchased electricity, purchased coolth/steam/heat, and/or on-site generated power used to support the building operations. **If available**, emissions associated with fugitives and refrigerants used in building operations should be reported **separately**.

If available, occupancy data should be correlated with the building area to allow Energy Intensity per occupant (o) to be calculated = **kWh/o/year.**

Energy Intensity
= kWh/m²/year
= kWh/o/year
Carbon Intensity
= $kgCO_2e/m^2/year$
= $kgCO_2e/o/year$

GHG emissions are calculated by multiplying the above Energy Intensity times the official GHG emission coefficients, for the year of reporting, for each fuel source used (*See Appendix 3*).

Carbon Intensity = $kgCO_2e/m^2/year$ or **$kgCO_2e/o/year$** (*kilograms of carbon dioxide equivalent per square meter or per occupant per year*)

Note: GHG conversion factors for each fuel type shall be the same as those used under national reporting for flexible mechanisms for the Kyoto Protocol for the six GHG (*See Appendix 4*).

This globally harmonized method for MRV energy use and GHG emissions provides the basis for establishing baselines, performance benchmarking, and monitoring building performance improvements. These activities are in turn fundamental to inform international mechanisms for carbon trading, policy development and analysis, and progress reporting on the mitigation of GHG emissions from buildings. Policy- and decision-makers can produce reports from the data collected through these METRICs for jurisdictions, regions, large building stock owners, cities or at a national level to form baselines that can be used to set targets and show improvements in carbon mitigation in the building sector.

Appendices

Appendix 1: Scope of Emissions

The building sector is nested within a larger context of global GHG emissions. (*See Figure 1*)

Total emissions from a building's life-cycle begins with the Before-Use Phase including extraction of raw materials, agriculture or forestry, then continues with manufacturing of building products and equipment and construction ***(See Figure 2)***. Building emissions extend for long periods of time during the Use-Phase of the building including operations, maintenance, and retrofits of the building ***(See Figure 2)***. Finally, emissions conclude with the After-Use phase including demolition, re-use and recycling of material components or energy content, and waste processing ***(See Figure 2)***. All Stages involve transportation of goods, services, and people.

On a global scale, data for Stage I and III are lacking for many regions, generally difficult to quantify, and can lead to double counting of emissions in other sectors such as industry, forestry, agriculture, and transport. **Because over 80% of GHG emissions are emitted during Stage II** and these emissions are measurable, reportable, and verifiable, only this Stage is included in the Common Carbon Metric represented in this paper. The impacts due to maintenance, repair and/or refurbishment and transport, shown in Figure 2, are not included in the Common Carbon Metric.

Furthermore, the Common Carbon Metric is based on a modular approach allowing future expansion to capture a greater scope of emissions from this sector. The modular approach recognizes that responsibility of decision-makers changes over different Stages and time, and that measurement and emissions boundaries will become further defined.

Scope 1: Direct, on-building-site or on-building-stocks, GHG Emissions

Direct on-site emissions result from sources within the boundaries of the building or building stocks under study that can be quantified by the reporting entity, including stationary combustion emissions, process

Figure 2: Description of the three Life Cycle Stages of a building and the different processes allocated to these stages, (Source: SB Alliance)

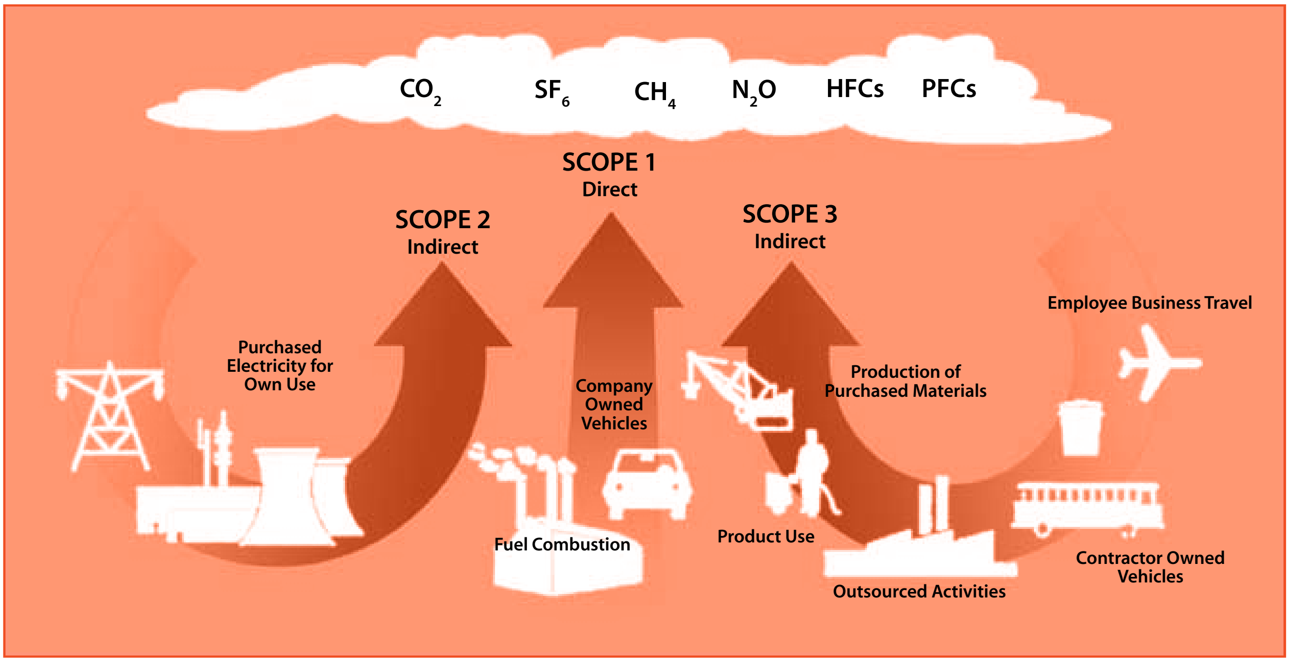
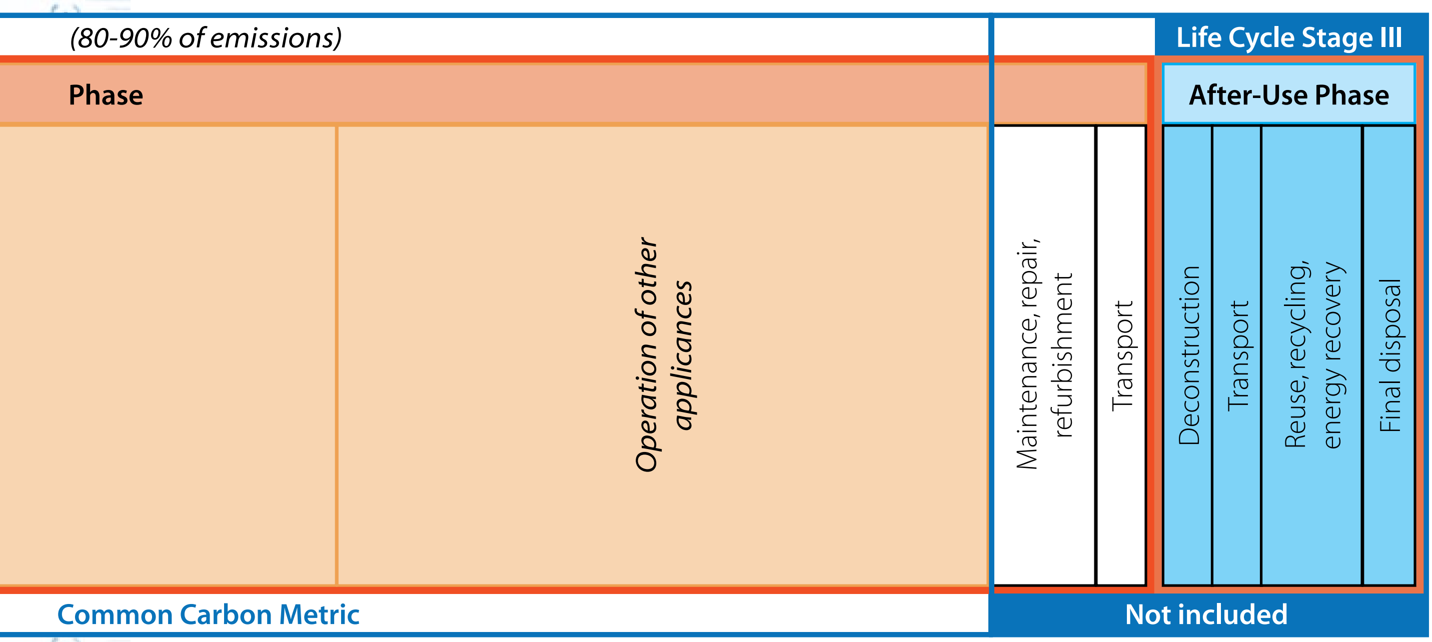


Figure 1: Scope of Emissions (Source: GHG Protocol)

emissions (e.g. of typical "small" building operation like refrigeration or use of computers, but not industrial processes like manufacture or assembly of products) and fugitive emissions. Scope 1 emissions included in the Common Carbon Metric are all direct GHG emissions, with the exception of fugitive emissions and direct GHG emissions from biogenic or industrial sources controlled by the reporting entity. Direct emissions are typically produced from the following types of activities:

- Stationary combustion emission from generation of on-site electricity, cooling, heat or steam
- Fugitive emissions from intentional or unintentional releases



Stationary combustion emissions result from the burning of fuels to produce electricity, steam, heat, or power using equipment, such as boilers, furnaces, etc., on the building site.

Fugitive emissions are not physically controlled by the reporting entity, but result from the intentional or unintentional releases of GHGs. They commonly arise from the production, processing, transmission, storage and use of fuels and other chemicals, often through joints, seals, packing, gaskets and so on.

Scope 2: Indirect on-building-site GHG Emissions

Indirect emissions are a consequence of the activities that occur outside the building site, for example activities at a community power plant for providing the energy consumed on-building-site. Scope 2 emissions included in the Common Carbon Metric are all GHG emissions associated with the overall generation of purchased energy such as electricity or steam, for ventilation or heating or the provision of any kind of fuels for heating. Reporting of Scope 2 emissions is a useful tool to help gauge energy usage and identify areas to reduce costs and emissions. By utilizing energy efficient technologies and implementing energy conservation practices, energy use is reduced, which in turn reduces costs and produces less GHG emissions.

Scope 3: Other Indirect GHG Emissions

Scope 3 addresses indirect emissions not covered in Scope 2 activities that are relevant to building performance that are not included in the Common Carbon Metric. Examples of these emissions include:

- Upstream and downstream emissions related to the before-use phase of the buildings, e.g. raw material extraction for metals.
- Transport related activities in vehicles related to all stages of the building life cycle
- After-Use phase activities such as:
  - Re-use, Recycling
  - Thermal recycling
  - Waste disposal processes, such as GHG emissions from final deposits

When accounting Scope 3 emissions, take care to choose activities that have not already been included in Scopes 1 or 2 and be transparent especially with respect to included or omitted processes.

Appendix 2: Bottom-up & Top-down

PROTOCOL	Aggregation (Bottom-up)	National/Regional(Top-down)
Basic Features	• Based on individual building assessment • Results are aggregated based on building type • Aggregation takes place by building type where information is available • Ultimately, when all building types are statistically represented (by climate region), then a global assessment of building stock can be established	• Based on national, regional, or local statistics • Consumption and savings are assessed on general level and correlated by use of model buildings • Typology can be used to disaggregate results further
Typical Applications	• Used for assessment of individual building compared to similar or model building • Emission reduction projects based on individual or a few buildings • Used to improve and qualify a top-down model • Used to create low-level (disaggregated) benchmarks	• Used for assessment of overall or national policies • Emission reduction projects based on national or regional initiatives • Used to calibrate and improve aggregated models • Used to create benchmarks in larger scale
Pros & Cons	• A large number of details can be included in the assessments and the model • A large number of building assessments are needed to establish a model • Further assessment can be used to improve the model • In order to create detailed benchmarks for different types of buildings if the sample of assessments is representative	• Few data are needed to make first assessments • Typology can be simple or complex • Can be established for all countries at present state • Improved statistics and assessments of individual buildings can be used to improve the model • Can be based primarily on existing data

Appendix 3: Data Sources

Purchased electricity

- Source of method: GHG Protocol tool 'Indirect CO_2 emissions from Purchased Electricity, Heat, or Steam'
- Emission factors: International Energy Agency Data Services. 2006. "CO_2 Emissions from Fuel Combustion (2006 Edition)."

Purchased coolth/steam/heat

- Source of method: GHG Protocol tool 'Allocation of GHG emissions from a combined heat and power (CHP) plant'; Version 1.
- Factors: The default factors for the assumed efficiency of electricity and steam production are sourced from the US EPA Climate Leaders program.

Power generation

- Source of method and fuel density data: GHG Protocol Calculation Tool for Direct Emissions from Stationary Combustion, Version 3.1.
- Emission factors: 2006 IPCC Guidelines for National GHG Inventories, Volume 2, Chapters 1 and 2.

Optional emissions

- Source of CFC and HCFC emission Factors: IPCC Special Report on Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons, Special Report of the IPCC, Cambridge, England, 2005.

Refrigeration and air-conditioning equipment

- Source of method: GHG Protocol tool 'Calculating HFC and PFC Emissions from the Manufacturing, Servicing, and/or Disposal of Refrigeration and Air-Conditioning Equipment'; Version 1.0.
- Emission factors: 2006 IPCC Guidelines for National GHG Inventories; Volume 3, Chapter 3.

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- ISO 15392:2008, Sustainability in building construction -- General principles
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- ISO 14040:2006, Environmental management -- Life cycle assessment -- Principles and framework

Appendix 4: Glossary of Terms

Activity Data	Data on the magnitude of a human activity resulting in GHG emissions. Data on energy use, miles travelled, input material flow and product output are all examples of activity data that might be used to compute GHG emissions.
Average Weather	Average weather may include average temperature, precipitation and wind patterns.
Building	Construction works that has the provision of shelter for its occupants or contents as one of its main purposes; usually partially or totally enclosed and designed to stand permanently in one place.
CH_4	Methane. A Kyoto Protocol greenhouse gas.
Climate Change	Climate change is any long-term significant change in the average weather of a region or the earth as a whole. For more information, see average weather.
Climate Neutrality	Climate neutrality is a term that refers to an entity with no net GHG emissions. Achieved by reducing greenhouse gas emissions as much as possible and by using carbon offsets to neutralize the remaining emissions.
CO_2	Carbon dioxide. A Kyoto Protocol GHG.
Combined Heat and Power (CHP)	An energy conversion process in which more than one useful product, such as electricity and heat or steam, is generated from the same energy input stream (cogeneration).
CO_2 Equivalent (CO_2e)	The universal unit for comparing emissions of different GHGs, expressed in terms of the global warming potential (GWP) of one unit of carbon dioxide. For more information, see GWP.
Emissions	See Appendix 1.
Emission Factor	GHG emissions expressed on a per unit activity basis. For example, metric tons of CO_2 emitted per million Btus of coal combusted or metric tons of CO_2 emitted per kWh of electricity consumed.
Greenhouse Gas (GHG)	The earth receives energy from the sun and returns the energy by reflecting light and emitting heat. Part of the outgoing heat flow is absorbed by greenhouse gases and re-irradiated back to the earth. While carbon dioxide is the greatest contributor to global warming, there are several reasons for opting to include the six gases covered by the Kyoto Protocol (Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydro-fluorocarbons (HFC's), Per-fluorocarbons (PFC's), and Sulfur Hexafluoride (SF_6)).

Gross Floor Area (GFA)	Total floor area contained within a building, including the horizontal area of external walls.
GHG Inventory	A quantified list of an organization's GHG emissions sources.
Global Warming Potential (GWP)	The ratio of radiative forcing that would result from the emission of one unit of a given GHG compared to one unit of carbon dioxide (CO_2).
HFCs	Hydrofluorocarbons. HFCs are Kyoto Protocol greenhouse gases.
Index	A framework for tracking & reporting building performance over time.
Intergovernmental Panel on Climate Change (IPCC)	International body of climate change scientists. The role of the IPCC is to assess the scientific, technical and socio-economic factors relevant to understanding the risk of human-induced climate change (www.ipcc.ch).
Metric	A method of measuring building performance indicators
NAMA (Nationally Approved Mitigation Action)	Unlike the commitments made by developed countries, which are specific, mandated, measurable commitment, NAMAs are voluntary actions supported by technological and capacity assistance from the developed world.
N_2O	Nitrous oxide. A Kyoto Protocol greenhouse gas.
Energy Performance	Delivered Energy use for building operations, and scope one and two greenhouse gas emissions
PFCs	Perfluorocarbons. PFCs are Kyoto Protocol GHGs.

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About the Sustainable Buildings and Climate Initiative

Launched in 2006 by the United Nations Environment Program (UNEP), the Sustainable Buildings and Climate Initiative (SBCI), formerly the Sustainable Buildings and Construction Initiative, is a partnership between the private sector, government, non-government and research organizations formed to promote sustainable building and construction globally.

UNEP SBCI
Sustainable Buildings & Climate Initiative

SBCI harnesses UNEP's unique capacity to provide a convening and 'harmonizing' role to present a common voice from the building sector on climate change issues. More specifically UNEP-SBCI aims to:

1. Provide a common platform for and with all building and construction stakeholders to collectively address sustainability issues such as climate change;
2. Establish globally consistent climate-related building performance baselines and metrics for monitoring and reporting practices based on a life cycle approach;
3. Develop tools and strategies for achieving a wide acceptance and adoption of sustainable building practices throughout the world;
4. Implementation - Promote adoption of the above tools & strategies by key stakeholders.

For more information,
see **www.unepsbci.org**

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