Evolution of Global Common Carbon Metric approach

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The Common Carbon Metric (CCM)

- Measuring Energy Use & Reporting GHG Emissions from Building Operations
- CCM protocol and Excel based tool
- Developed by UNEP: SBCI
- Meets the requirements that reporting is measurable, reportable and verifiable (MRV)
- Phase 1 pilot: 2010-2011
- Phase 2 pilot: 2011-2012
- Energy: \( \text{kWh/m}^2/\text{yr} \)
  \( \text{kWh/occupant/yr} \)
- Emissions (equivalent (e)): \( \text{kgCO}_2e/\text{m}^2/\text{yr} \)
  \( \text{kgCO}_2e/\text{occupant/yr} \)
CCM methodology

- **Top-down approach:** Performance of the whole (regional, city or national level) is characterized at a coarse level using *estimated* data on fuel and electricity consumption.

- **Bottom-up approach:** Performance of individual case-study buildings is characterized at a fine level using *measured* data on fuel and electricity consumption.
  - Ideally sample size will be statistically valid, enabling verification of the whole.
Top-down approach: data requirements

- **Area** of the Whole (m²).

- **Total occupancy** of the whole (number of occupants, or number of residents where information on occupancy is limited).

- Information on the percentage of the Whole’s occupants and building area attributable to different categories of building stocks (%).
  - At a minimum for: residential and non-residential buildings.

- Information on the **total amount of electricity** consumed by the Whole and on the amounts of **different types of fuels** used.

- Information on the percentage of the Whole’s electricity and fuel use that is attributable to different categories of building stocks (%).

- **Custom emission factors** may optionally be provided in place of the default emission factors for electricity and fuel use.
Bottom-up approach: data requirements

- **Descriptive information**, including **building name**, **building category**, year of construction and year of last major retrofit, and address.

- **Occupancy** (number of occupants) and **area** (m²).

- Data on the **total amount** of purchased and **metered electricity** (in kWh).

- Data on the **total amount of different fuels** consumed (various measurement units).

- Custom emission factors may optionally be provided in place of the default emission factors for electricity and fuel use.

- Users may optionally report the **amount of purchased green power** or the **amount of renewable energy that has been generated on-site** and **returned to the grid**.
CCM Phase I Pilot: key outcomes

• Performance metrics computed for a total of:
  - 49 individual buildings (total area: 1.48 km²)
  - 5 larger stocks (or Wholes) (total area: 176.60 km²)

• Submissions spanned multiple climate regions in Australia, Asia, Europe, India, N. America, and Africa.

• Consensus-based definitions added about building area, building occupancy.
CCM Phase II Pilot: Technical enhancements in CCM

- Performance metrics being computed for:
  - >150 individual buildings (total area: 7.4 km²)
  - 7 larger stocks (or Wholes) (total area: 177 km²)

- Expanded list of **residential** and **non-residential building** types based on UNFCCC’s building categorizations.

- Normalize building performance by degree day.

- Input fuel consumption data by month through the top-down and bottom-up approaches.

- Input information on multiple fuels for the same building.

- Record amount of purchased green power or amount of renewable energy generated on-site and returned to the grid.

- kWh / m² / year
- kgCO₂e / m² / year
- kWh / occupant / year
- kg CO₂e / occupant / year
- kWh / m² / year / DD
- kWh / occupant / year / DD
CCM 2.0 – Web-based version

Ongoing development/testing
CCM 2.0 – Web-based version

THE CCM TOOL

Use the online tool to vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet

START USING THE TOOL

DOWNLOAD THE TOOL

Use the online tool to vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est Lorem ipsum dolor sit amet

Supported by:

This project is part of the International Climate Initiative. The Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety supports the initiative on the basis of a decision adopted by the German Bundestag.

UNEP

Based on a decision of the German Bundestag
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The Common Carbon Metric Tool allows you to...
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1. Basic Information

Name of your Assessment

Type a name

Description

Please, select the approach you would like to use for your assessment

- Top-down
- Bottom-up
- Hybrid

Would you like to conduct baseline or future-lines assessment?

- Baseline
- Futureline(s)

Select a baseline

Baseline one

CREATE A NEW BASELINE

Specify the start and end year of your futureline

2014 to 2020

Type the name of your futureline

futureline 1

Please, indicate the level you would like to make the assessment for

- Region
- Country
- City
- District
- Portfolio of individual buildings

Notes

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# CCM 2.0 – Web-based version

![Image](https://via.placeholder.com/150)

## 2. Overall data

<table>
<thead>
<tr>
<th>No</th>
<th>Building ID / name (if applicable)</th>
<th>Building type</th>
<th>Building vintage</th>
<th>Data type</th>
<th>Fuel use (kWh)</th>
<th>Electricity use (kWh)</th>
<th>Floor area (m²)</th>
<th>Occupancy (person)</th>
<th>Source of data</th>
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<td>Existing</td>
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</tbody>
</table>

2.1. Please, provide data for each building in the project according to the data requirements indicated in the table.
CCM 2.0 – Web-based version

3. Electricity use

3.1. Is it possible to provide data on electricity use for different end-uses?

- Yes
- No

Notes

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3. Electricity use

3.3. Please, provide data on electricity use for different end-uses in each building (if the end-use is not applicable for the building, please, put zero) ☝

<table>
<thead>
<tr>
<th>No</th>
<th>Building ID / name (if applicable)</th>
<th>Unit</th>
<th>Data type</th>
<th>Space cooling</th>
<th>Space heating</th>
<th>Hot water</th>
<th>Lighting</th>
<th>Appliances</th>
<th>Source of data</th>
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<td></td>
</tr>
</tbody>
</table>

Add a building
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4. Fuel use & GHG Emissions

4.1. Is it possible to provide data on fuel use for different end-uses?

- [ ] Yes
- [x] No

Notes

SAVE & NEXT
## CCM 2.0 – Web-based version

### RESULT

<table>
<thead>
<tr>
<th>No</th>
<th>Building ID / name</th>
<th>Energy use (electricity + fuel)</th>
<th>GHG emissions</th>
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</thead>
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<td>kWh/m²</td>
<td>CO₂e/m²</td>
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<tr>
<td></td>
<td></td>
<td>This building</td>
<td>Average for this type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kWh/occupant</td>
<td>This building</td>
</tr>
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<td>Building 1</td>
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<td>300</td>
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<td>Minimum</td>
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</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>400</td>
<td>300</td>
</tr>
</tbody>
</table>
Wider application of CCM

• CCM has helped to establish a system of **MRV** indicators for the follow-up of policy implementation and reporting on building-related GHG emissions, so as to support energy efficiency work in the building sector.

**Nationally Appropriate Mitigation Actions (NAMAs)**

• NAMAs refer to any action that reduces emissions in developing countries and is prepared under the umbrella of a national governmental initiative.

• To facilitate NAMAs, a globally consistent MRV methodology is essential to measure and track energy use and energy reductions from buildings.

• **CCM is able to support the establishment of baselines from the sector or sub-sector** (residential, commercial, etc.), thus allowing measurement over time of increased efficiency and GHG reductions from a particular building stock. (UNEP DTIE project -NAMAs for the Building Sector in Asia)

**ISO standard**

• CCM has informed the development of an ISO standard on carbon metric of buildings (ISO/TC59/SC17).
Thank you!