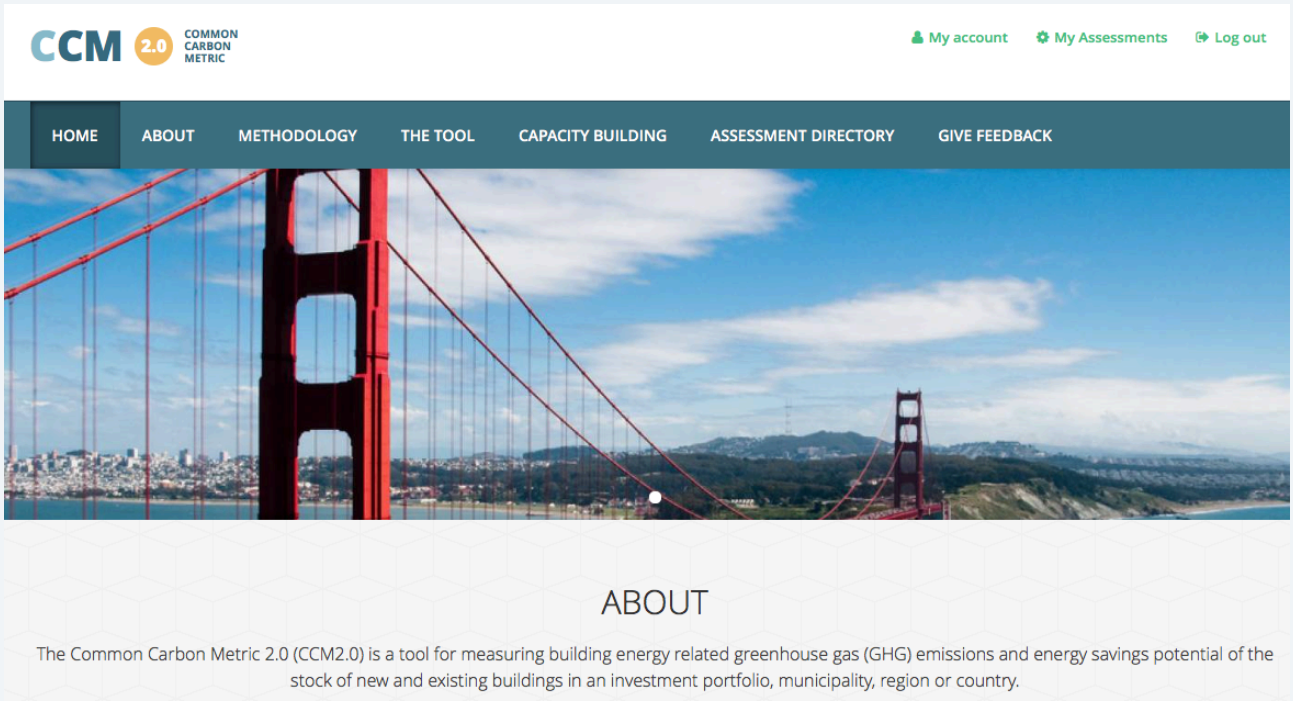
Common Carbon Metric 2.0: CCM2.0

Training Exercises



Joint UN Environment – UNFCCC Workshop on Mitigation in the building sector.

Bonn, Germany August 01 2017

GBPN
Global Buildings Performance Network

Building Policies for a Better World

ACTIVITY 1 - SETTING UP & GETTING FAMILIAR WITH CCM2.0

The CCM 2.0 website is available at http://ccmbuildings.net/. You can log in by clicking on the "Log in" button in the top right corner. If you don't have an account yet, you can register one by using the "Register" button instead, filling in all the mandatory fields in the upcoming form and clicking on "Create new account". Every user is able to create assessments after logging and editing their own assessments.

1a. Register & Log-in (Please write down your user name and password for future use)

1b. Review the Assessment Directory

Open 'Baseline Top-Down' – This is an example of a completed 'top-down' baseline assessment
Explore the results in table and visual view. Note the data required and the units/metrics of outputs.

Open 'Baseline Bottom-Up' – This is an example of a completed 'bottom-up' baseline assessment
Explore the results in table and visual view. Note the data required and the units/metrics of outputs.

ACTIVITY 2 - CONDUCTING A BASELINE ASSESSMENT

To conduct an assessment, go to 'The Tool' tab. The tool is based on a calculation methodology that conforms to 'measurable, reportable and verifiable (MRV)' data standards. It offers three ways of generating energy use and GHG emissions base lines for a stock of buildings (top-down, bottom-up and hybrid).

Top-Down:
This approach is useful if you only have access to aggregated building energy use data such as national, regional or municipal statistics on residential and/or non-residential energy-use. This approach requires information on the total building stock, total energy use and shares of different building types in the total energy use of the building sector. This approach is mostly useful, when the assessment has to be done on a large scale (e.g. country) and there is a lack of detailed data on that level. The tool guides you through a simple step-by-step process to disaggregate this data to generate MRV emissions base line by building type.

2a: Calculate an Energy & Emissions Baseline using the Top-Down approach.

Using the online version of the tool, select 'baseline' assessment.

Enter the Name of the Assessment:
'(Your Family Name) Bonn August 2017 Top-Down'

Description:
Bonn CCM Training Workshop 1 August 2017 – Top Down Baseline Test.

Next: Select 'Top Down' Assessment.

Thailand Building Energy Base-Line Data Set

Table 1:Fuels used for Electricity Generation in 2016

Fuel type	GWh/yr	%
Natural Gas	128 525,00	66,87
Coal&Lignite	34 582,11	17,99
oil	922,61	0,48
Hydro	3 760,73	1,96
Renewable	9 984,55	5,20
Imported	14 414,49	7,50
total	192 189,49	100

From :EPPO ENERGY STATISTIC

Table2:Electricity used by Sectors in 2016

Sector	GWh/yr	%
Residential	41 286	23,61
Commercial	52 987	30,31
Industrials	74 773	42,77
Others	5 787	3,31
total	174 833	100,00

From :EPPO ENERGY STATISTIC

Table3:Fuel used in residential sector in 2016

Sector	kWh/yr	ktoe/yr
LPG	21 631 800 000	1860,00
Total	21 631 800 000	1860,00

From :EPPO ENERGY STATISTIC

no. of houses in 2016

Sector	value	units
Houses	19 801 917	units

From:PEA,MEA Statistic

Estimation of utilization area of all residential sector

Sector	value	units
Area	1 089 105 435	m2

From:KMUTT

Emission Factor

Sector	value	units
Electricity	0,5813	kgCO2/kWh
LPG	0,22736	kgCO2/kWh

From : TGO

Building Type: Total Residential

Total Net Floor Area: 1089105435 m^2

Total No. Occupants: 60000000 persons (est. 3 per house)

Emission Factors (Thailand): Refer to table above.

Bottom-Up:

This approach is useful if you have more detailed measured energy use data from a representative sample of buildings in your building stock. You will be able to build-up an MRV baseline by entering more detailed energy data from individual buildings in different categories of building types – such as single or multi-family residential, commercial, hospitals etc. This approach focuses on (one or several) individual buildings and requires information on floor area and, total energy consumption in kWh and fuel mix for each particular building. Bottom-up approach can be applied as well, if all required data can be found for representative case studies, typical buildings or assumed averages. It also allows for utilizing experts' judgments (e.g. regarding specific energy consumption values) in case measured data are impossible to obtain.

The Bottom-up approach is very useful for a certain (limited) group of buildings and/or for a concrete mitigation project, but can be less useful for establishment of a national baseline or Business as Usual (BAU).

2b: Calculate an Energy & Emissions Baseline using the Bottom Up Approach

In this example the following energy data, collected by KMUTT from the NHA Project household sample data, is required.

Start a new assessment

Enter the Name of the Assessment:
'(Your Family Name)_Bonn August 2017 Bottom Up'

Description:
Bonn CCM Training Workshop 1 August 2017 – Bottom Up Baseline Test.
Next: Select 'Bottom Up' Assessment.

Floor Area, Electricity & Occupancy Data

Area,Occupancy and Electricity use

NHA sample projects	BLDG. Type	Construction year	Floor area per unit (m2)	Unit surveyed	Area surveyed	no. of occuplants	Total occuplants surveyed	Total monthly consumption(kWh)	Average monthly consumption(kWh)
LADLUMKEAW	single house	2010	61,97	315	19 520,55	5	1 575	65 094,70	206,65
BANGKEAW	twin house	2009	54,835	158	8 663,93	4	632	36 024,47	228,00
RANGSIT	row house	2012	55,22	350	19 327,00	4	1 400	50 404,74	144,01
SARAYA	flat	2006	47,14	334	15 743,65	3	1 002	56 858,68	170,24
total	all			1157					

Share of Energy use in household

Equipment	lighting	air conditioners	electric appliances
share of Energy use	15%	50%	35%

Energy Consumption by Fuel Type

Fuel use

NHA sample projects	BLDG. Type	average monthly LPG use(kWh)
LADLUMKEAW	single house	158
BANGKEAW	twin house	137
RANGSIT	row house	120
SARAYA	flat	0
total	all	

Number of all NHA project in 2016

BLDG. Type	no. of units
single house	3152
twin house	1092
row house	635
flat	2176
total	7055

Hybrid Approach:
This approach requires information on total floor area and, most importantly, specific energy consumption in kWh/m2, which allows for calculating total energy use for different end-uses, building types, climate zones, etc. at the level of a region, country or city. The Hybrid approach can be use on a smaller scale, when it is important to analyze different influences on energy use and GHG emissions (e.g. in different building types or climate zones), or in cases where there is a lack of data and need for detailed assessment on larger scales (country, region, etc.).

2c: Calculate an Energy & Emissions Baseline using the Hybrid Approach

Start a new assessment

Enter the Name of the Assessment:
'(Your Family Name)_Bonn August 2017 Hybrid'

Description:
Bonn CCM Training Workshop 1 August 2017 – Hybrid Baseline Test.

Next: Select 'Hybrid' Assessment.

Based on the Bottom-Up Case Studies Total Floor Areas calculate the energy intensity in kWh/m^2 (or use the average of results from the Bottom-Up and top down baselines) – *note any discrepancy in the final energy intensity results*.

ACTIVITY 3: ESABLISH A FUTURE LINE SCENARIO

'Futureline' analysis follows the same steps to make estimations for the first ('base') year, however, as future-line analysis also includes estimations for the future, it requires data for more parameters such as renovation rates, changes in occupancy, new construction rates, and includes additional calculations to enable projection of future energy demand and emissions.

The CCM2.0 Tool will guide you through the input date required in the futurelines sections. The data requirements for futurelines change depending on whether you are working in top-down, bottom-up or hybrid modes. You must calculate a baseline before you can begin working on futurelines for a particular project or jurisdiction.

Start a new assessment

Enter the Name of the Assessment:
'(Your Family Name)_Bonn August 2017 Future Line 1'

Description:
Bonn CCM Training Workshop 1 August 2017 – Future Line 1.

Upload a saved top-down baseline assessment

Data:

Period of Analysis:	Base year: 2016 – 2030
Renovation Rate:	Fixed at 2%/yr
Demolition Rate:	Fixed at 20%/yr
Construction Rate:	Fixed at 30%/yr
Occupancy Rate:	Fixed at 10%/yr
Electricity Use Change Rate:	Fixed at 30%/yr
LPG Change Rate:	Fixed at 20%/yr

Note: You can also select variable for any of the above criteria if you want to model changes in specific years or periods.

Analyse and Compare

Once you have established a baseline, you can generate comparisons of base-line and futureline scenarios and generate results in graphic or table formats. These outputs can be used to support policy recommendations, roadmaps and applications for climate finance.

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