United Nations Framework Convention on Climate Change

Grid emission factor and RCC St. George's support

GEF-UNEP ENERGY FOR SUSTAINABLE DEVELOPMENT IN CARIBBEAN BUILDINGS (ESD) PROJECT

SECOND MEETING OF THE REGIONAL COORDINATION COMMITTEE (RCC)
BUCCAMENT BAY RESORT, ST. VINCENT AND THE GRENADINES
12-13 OCTOBER 2015

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OUTLINE

o Regional Collaboration Centre (RCC) St. George's

o What is the Grid Emission Factor (GEF)

o GEFs in the Caribbean

o Remarks

RCC St. George's

The RCCs are designed to help under-represented regions increase their attractiveness and potential for CDM, by building their capacity and reducing the risk for investors. These centres are intended to support the identification of CDM projects, provide assistance for the design of such projects, address issues identified by validators, and offer opportunities to reduce transaction costs.

Regional Collaboration Centre contact information and reference material from workshops:

RCC	RCC Lomé, Togo	RCC Kampala, Uganda	RCC St. George's, Grenada	RCC Bogotá, Colombia	RCC Bangkok
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Workshops	2013 more 2014 more 2015 more	2013 more 2014 more 2015 more	2013 more 2014 more 2015 more	2013 more 2014 more 2015 more	2015 more

RCC St. George's

RCC St. George's

- Support at different stage in project cycle
    - Prior Consideration
   - Project design document (PDD)
    - CER Issuance

- To prepare the Sustainable Development Co-benefit (SDC) Report
- To prepare and update monitoring reports

- Support in Standardized Baseline Cycle
    - Proposed SB
    - Preparing Submission
    - Validating Submission

What is a grid emission factor?

Measure of CO2 emissions intensity per unit of electricity generation in the grid system (tCO2/MWh)
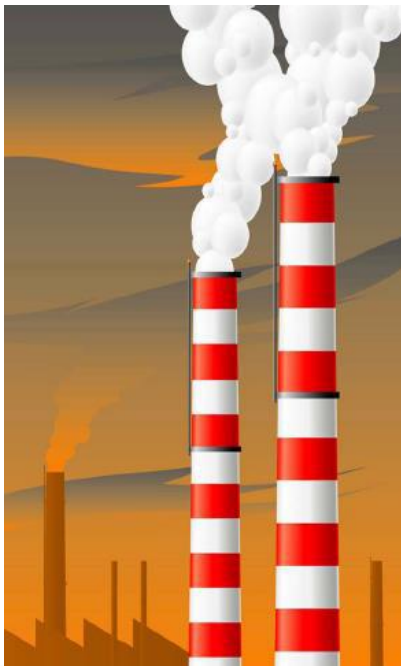
How is a GEF calculated?

• **"Tool to calculate the emission factor for an electricity system", or**

• **"Guidelines for the establishment of sector specific standardized baselines"**

CDM Website

GEF-Calculation

This table is to be repeated as per the number of power generating plants

Site data	Unit or information	2014	2013	2012	2011	2010
Plant Name						
Year of construction						
Contact Information (primary data provider)						
Name of technology used						
Name of Fuel 1 consumed						
Net electricity Production	MWh					
Amount of fuel 1 consumed	m^3					
Net Calorific Value of fuel 1	Gj/ton (if available)					
Emission factor of fuel 1	tCO2/ Gj (if available)					

GEF-SB Proposal Submission

o Data Delivery Protocol

o Quality Control (QC) Report
   (credibility, Transparency & traceability)

o CDM proposed standardized baseline form

o GEF-Excel sheet
"Tool to calculate the emission factor for an electricity system",

GEF – RCC St. George's support

Country	GEF, tCO2/MWh (CDM projects) *	GEF, tCO2/MWh (RCC St. George's) **
Antigua & Barbuda	-	In progress
Bahamas	0.723 (CDM 5620)	-
Belize	-	0.2278 (PSB0006)
Grenada	-	0.585 (PSB0023)
Guyana	0.948 (CDM 1458)	In progress
Jamaica	0.834 (CDM 0239)	Data gathering
St. Lucia	-	In progress (data collection)
St Vincent & the Grenadines	-	**0.7309** (PSB0021)
Trinidad & Tobago	0.666 (CDM 9358)	In progress (Internship)

*) https://cdm.unfccc.int/Projects/projsearch.html
**) https://cdm.unfccc.int/methodologies/standard_base/new/sb8_index.html

Methodology

Small Scale
https://cdm.unfccc.int/Reference/Documents/AnnexII/English/annexII.pdf

A. <u>Type (i) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 megawatts</u>

B. <u>Type (ii) project activities: energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15 gigawatt hours per year</u>

Methodology

AMS-II.E. Energy efficiency and fuel switching measures for buildings

Women and children

| Typical project(s)	Installation of, or replacement or retrofit of, existing equipment with energy efficiency (e.g. efficient appliances, better insulation) and optional fuel switching (e.g. switch from oil to gas) measures in residential, commercial or institutional buildings.
Type of GHG emissions mitigation action	· Energy efficiency. Electricity and/or fuel savings through energy efficiency improvement. Optionally, use of less-carbon-intensive fuel.
Important conditions under which the methodology is applicable	· Energy use within the project boundary shall be directly measured; · The impact of the implemented measures (improvements in energy efficiency) can be clearly distinguished from changes in energy use due to other variables not influenced by the project.
Important parameters	At validation: · Energy use of buildings before the project implementation; · If grid electricity is consumed: grid emission factor (can also be monitored ex post).
	Monitored: · Specifications of the equipment replaced or retrofitted (only for replacement or retrofit projects); · Energy use of buildings after the project implementation.

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Methodology

BASELINE SCENARIO
Use of less-efficient and/or more-carbon-intensive equipment in buildings.
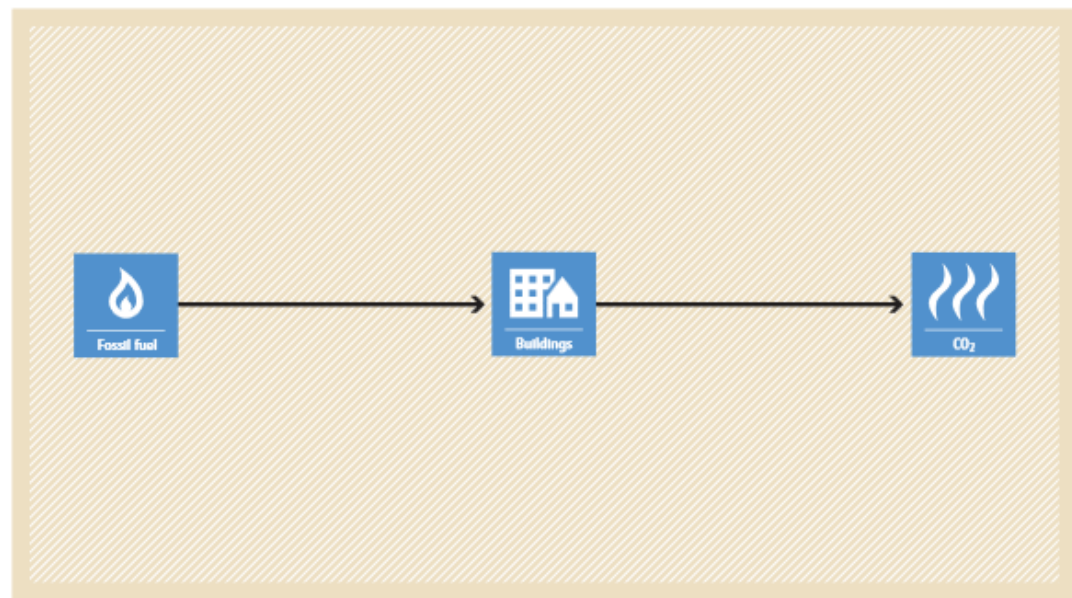
PROJECT SCENARIO
Use of more-efficient and/or less-carbon-intensive equipment in buildings.
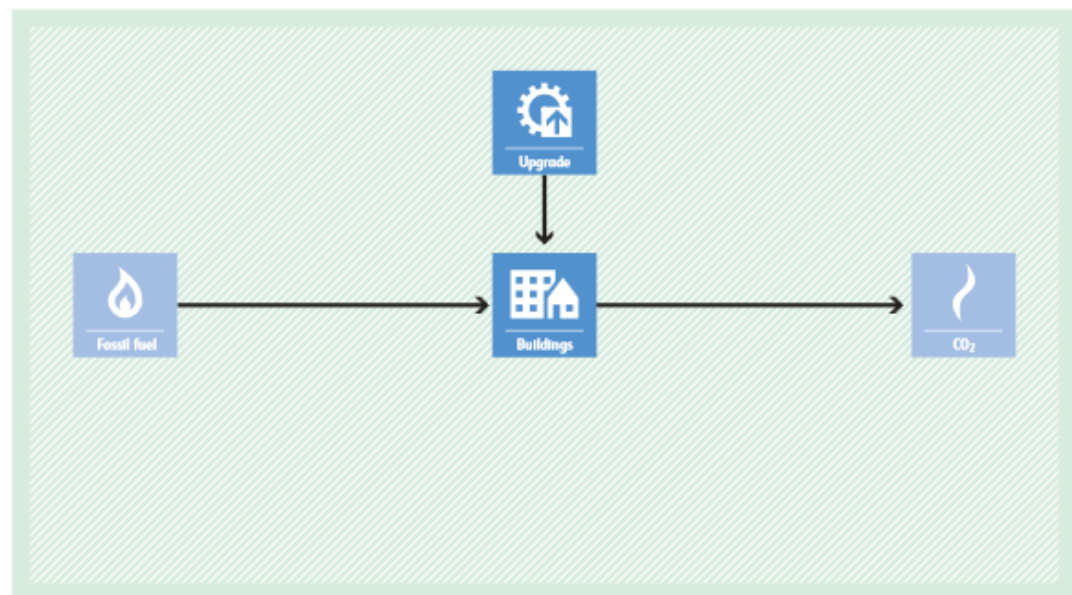
GEF – Example project activity (Meth. AMS II J)

Project activity installed about 600,000 CFLs (100W and 60W incandescent light bulbs with self-ballasted CFL 350,000 -20W and 250,000 -12W respectively)

$$NES_y = \sum_{i=1}^{n} Q_{PJ,i} \times (1 - LFR_{i,y}) \times ES_i \times \frac{1}{(1 - TD_y)} \times NTG$$

$NES = NES12 + NES20$ (KWh/year)

$NES = 16316560.9 + 40102391.3 = 56418952.2$ (KWh/year)

GEF – Example project activity (Meth. AMS II J)

The emission reduction for the year

$$ER_y = NES_y \times EF_{CO2,ELEC,y}$$

= 56,400MWh x 0.7309 tCO2/MWh

= 41,200 tCO2 / year

GEF-Benefits

o Facilitate reporting

  o National Communications

  o Mitigation and Adaptation Strategies

  o Intended National Determined Contribution (INDC)

GEF-Benefits

o Facilitate revenue generation
    o Sale of CER
        o Climate Nuetral (22 September 2015)
            http://www.climateneutralnow.org/SitePages/Home.aspx

    o Carbon Market

= 56,400MWh x 0.7309 tCO2/MWh

= 41,200 tCO2 / year

Possible Revenue generation
USD$5/tCO2

=41,200 tCO2 x USD$5/tCO2   **= 206,000 USD$/year**

GEF-Benefits

Remarks

1. Accurate GEF values supports (part of) the **decision making process** to achieve renewable energy targets under country or regional plans by
   o **Selecting** type/size of interventions based on emission reductions

2. GEF is used to calculate the emission reduction from **renewable energy**

3. GEF is also used to estimate carbon reductions for any type of intervention that **reduces electricity consumption** e.g. energy efficiency

4. RCC St George's provides *in-kind* **assistance** to regional stakeholders in
   o Carbon accounting for electricity sector interventions; e.g. renewable energy and energy efficiency technologies
   o Estimating/updating GEFs

THANK YOU!

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