Clean Development Mechanism (CDM) and Climate Finance

Training Workshop and Public Consultation on Developing Standardized Baseline-Grid Emission Factor
Paris Agreement

Increased ambition of the long term goal

- Implementation of NDCs
- Higher ambitions by Parties
- Collaborative actions

2°C  1.5°C  zero

168 out of 197 Parties have ratified the Paris Agreement
Greenhouse gas emissions (GtCO₂eq/yr GWP-100 AR4)

- **Pre-INDC scenarios**
- **INDCs**
- **Least-cost 2°C scenarios**
- **1.5°C scenarios**

Ranges:
- **1**: High Cancun pledge scenarios until 2030 with const. policy thereafter (n = 31; Ampere HST P3 in IPCC AR5 scenario database)
- **2**: Min/max of conditional & unconditional INDC ranges, globally aggregated
- **3**: Delay-2030 (P3) scenarios with >50% likelihood of staying below 2°C (n=21 from IPCC AR5 scenario database)
- **4**: ‘Immediate’ onset mitigation (P1) scenarios with >66% likelihood of staying below 2°C (n=14 from IPCC AR5 scenario database)
- **5**: Delay-2030 (P3) scenarios with >50% likelihood of staying below 2°C (n=21 from IPCC AR5 scenario database)
- **6**: Reductions below reference scenarios due to INDCs (median)
- **7**: Illustrative difference between INDCs and 2°C mitigation scenarios (P1P2)
- **8**: Delay-2020 (P2) scenarios with >50% likelihood of staying below 1.5°C by 2100 (median) (n=6 from scientific literature)
Context: Post Paris Agreement

- **Significant increase** in the number of countries taking climate action, often within the **national scope**

- However, the emission levels **do not fall within 2°C or 1.5 °C scenarios**

- Achieving 2°C or 1.5 °C depends on enhanced reductions **before and after 2030** and on **long-term changes** in key social, economic and technology drivers

- **Carbon finances** will be the main driver of the mitigation activities needed to be implemented to fill the gap
Linking CDM with Green Climate Fund

GCF
• GCF offers funding opportunities to **transformative projects** targeting mitigation and adaptation to climate change

CDM
• CDM rewards **emissions reduction projects/programmes** with carbon credits based on actual performance.
Baseline setting for evaluation of GHG mitigation projects

Training Workshop and Public Consultation on Developing Standardized Baseline-Grid Emission Factor

Paramaribo, Suriname
26-27 October 2017
What is baseline?

• **Baseline Scenario/emissions:**
  a) describe future GHG emissions in the absence of defined mitigation efforts and policies
  b) Counterfactual emissions scenario against which emission reductions are counted

• **Why robust/credible baseline**
  a) To ensure a project will result in real GHG emissions reductions that would not have occurred in the absence of the project.
  b) Serves as a reference level to define national mitigation goals and targets
  c) Provide a benchmark for mitigation targets
  d) Support national climate change policy preparation
  e) Estimate the mitigation impact and assess progress in implementation

- Baselines are constructed and/or depend on the type of mitigation goals
Example of a baseline-scenario goal

A. The ex-ante baseline scenario: Most likely to occur in the absence of policies or measures to meet a mitigation goal.

Investments analysis - with/without climate finance

Choose an appropriate financial indicator, such as IRR, NPV or benefit-cost ratio, to demonstrate additionality.

Concessionality/Carbon revenue makes the project worthwhile.

Project without additional support - unviable.

Project with additional support.

Break-even point.

Revenue / NPV / IRR.
Financing models for GHG mitigation projects linking CDM

**Grant financing**
- where grant disbursements are linked to GHG impacts via upfront or results-based payments.

**Debt funding**
- where the Fund pegs its debt terms and conditions to greenhouse gas mitigation results tracked under the CDM.

**Equity financing**
- where the Fund pegs its equity terms and conditions to greenhouse gas mitigation results tracked under the CDM.

**Guarantees**
- where the Fund offers revenue support through price guarantees linked to issued carbon credits.
Climate finance under the Paris Agreement

Public benefits

GHG mitigation projects (e.g., RETs, EE)

Debt finance / Grants / Subsidy / Conditional finance

Climate finance / Carbon funds

MFIs

Host Party commitments

CERs

ITMOs

CERs cancelled

Host Party approvals

Annex I Party approval

Annex I Party compliance buyer
Why Standardized Baseline

• Moving away from project by project baseline determination

• Sector-specific standards (regional, national, or sub-national)

• Either calculates baseline emission factor for broad class of mitigation activities (measures) taken up in the sector, or baseline emission factor for entire sector

• Reduce transaction costs
Why Standardized baseline

• Addresses the environmental integrity and transparency issues
• Payment for performance to ensure delivery
• Provide visibility to the contribution of institutional investors in mitigating climate change

• Robustly setting baseline matters!
Why Standardized baseline?

- Baseline, baseline factors developed using SBs can be used for wider mitigation actions including **NAMAs and NDCs**, to calculate impact of an mitigation intervention (emission reduction).

- SBs are not only used for an offsetting mechanism, but also for **wider mitigation outcomes** including those for:
  a) Carbon finance
  b) Climate finance
  c) Result based finance
  d) NAMAs and NDCs

- SB is a **reliable, UN-recognized tool** that offers a **transparent means** to develop **baseline or baseline factors** for monitoring, reporting and verification purpose of mitigation outcomes.
Baseline in the context of power sector (RE and EE)

Grid Connected Projects
• What would have happened in the absence of project intervention:
  a) the baseline scenario is the operation of grid-connected power plants and the addition of new generation sources – in the absence of intervention
  b) Emission factor (tCO2/MWh) serving as a performance indicator applicable to multi-project

Off-grid projects
• What would have happened in the absence of project intervention
  a) Operation of existing Mini-grid
  b) For users who didn’t have access to electricity prior to project implementation, BL depends upon type of technology and consumption level of users
Present Status

• **About 30 SBs** are approved

• **12 bottom up** and **8 top down** submissions are under processing

• Sectors covered are:
  ✓ Electricity generation
  ✓ Rural electrification
  ✓ Cement
  ✓ Charcoal
  ✓ Waste (LFG flaring and electricity/power generation)
  ✓ Rice mill
  ✓ Rice cultivation
  ✓ Cook stoves
  ✓ Forestry
Approach to derive baseline emission factor for off-grid projects
Provisions under CDM Methodologies
## Standardized Methodologies for off-grid

<table>
<thead>
<tr>
<th>Meths.</th>
<th>Title</th>
<th>Default Baseline EF tCO₂/MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMS-I.A.</td>
<td>Electricity generation by the user</td>
<td>0.8</td>
</tr>
<tr>
<td>AMS-I.B.</td>
<td>Mechanical energy for the user with or without electrical energy</td>
<td>0.8</td>
</tr>
<tr>
<td>AMS-I.F.</td>
<td>Renewable electricity generation for captive use and mini-grid</td>
<td>0.8</td>
</tr>
<tr>
<td>AMS-I.L</td>
<td>Electrification of rural communities using renewable energy</td>
<td>6.8/1.3/1.0</td>
</tr>
<tr>
<td>AMS-III.AW</td>
<td>Electrification of rural communities by grid extension</td>
<td>0.8</td>
</tr>
<tr>
<td>AMS-III.BB</td>
<td>Electrification of communities through grid extension or construction of new mini-grids</td>
<td>6.8/1.3/1.0</td>
</tr>
<tr>
<td>AMS-III.BL</td>
<td>Integrated methodology for electrification of communities (covers the scope of all above methodologies)</td>
<td>6.8/1.3/1.0</td>
</tr>
</tbody>
</table>
AMS-III.BL. Electrification of communities

**BASELINE SCENARIO**
In the absence of the project activity, the end users would have used fossil fuel based lighting, stand-alone diesel electricity generators for appliances other than lighting (e.g. TV) or would have been supplied by carbon-intensive mini-grid.
AMS-III.BL. Electrification of communities

PROJECT SCENARIO
Consumers are supplied with electricity by new construction of renewable energy system or hybrid energy system or rehabilitation/refurbishment of renewable energy system or connection to a national or regional or mini-grid.
AMS-III.BL: Scope

- Displacement of fossil based lighting system, standalone DGs or DG-mini-grid

- Consumers [partly or fully]
  - Not connected to national/regional grid
  - supplied with fossil fuel systems

- Technology/measures:
  - New construction / Rehabilitation or refurbishment (renewable energy system, hybrid energy system)
  - Hybridization of existing fossil-fuel mini-grids
  - Installation, extension of a mini-grid
  - Extension of a grid
Default Emission factor for DG mini-grid

<table>
<thead>
<tr>
<th>Type of grid</th>
<th>Mini-grid with 24-hour service</th>
<th>i) Mini-grid with 4- to 6-hour service</th>
<th>ii) Productive applications</th>
<th>iii) Water pumps</th>
<th>Mini-grid with storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load factor</td>
<td>25%</td>
<td>50%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 15 kW</td>
<td>2.4</td>
<td>1.4</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;= 15 to &lt; 35 kW</td>
<td>1.9</td>
<td>1.3</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;= 35 to &lt; 135 kW</td>
<td>1.3</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;= 135 to &lt; 200 kW</td>
<td>0.9</td>
<td>0.8</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;= 200 kW ***</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
BE_{T3,y} = \sum_{w=1}^{P} \left( EC_{T3,w,y} \times EF_{CO2,T3} \right)
\]
Baseline emissions using default factors (for consumers without prior access to electricity)

- Displacement of carbon intensive lighting and electricity sources
- Default EF using tiered approach based on consumption level and type of consumers

Tiered emission factors:

Tranche 1: \([EC_x < 55 \text{ kWh/year}] = 6.8 \text{ kg CO}_2/\text{kWh};\)

Tranche 2: \([55 < EC_y < 250] = 1.3 \text{ kg CO}_2/\text{kWh};\)

Tranche 3: \([EC_z > 250] = 1.0 \text{ kg CO}_2/\text{kWh}.\)

For \(EC_k > 500\text{kWh/y} \rightarrow 1.0 \text{ kg CO}_2/\text{kWh}\) and no tranche applies.
**Table 1. Grid emission factors for the central grid of The Gambia**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>SI unit</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{EF}_{\text{grid,CM,y}}$</td>
<td>tCO$_2$/MWh</td>
<td>Combined margin CO$_2$ emission factor for the electricity system applicable to wind and solar power generation project activities.</td>
<td>0.697</td>
</tr>
<tr>
<td>$\text{EF}_{\text{grid,CM,y}}$</td>
<td>tCO$_2$/MWh</td>
<td>Combined margin CO$_2$ emission factor for the electricity system applicable to all project activities other than wind and solar for the first crediting period.</td>
<td>0.682</td>
</tr>
</tbody>
</table>

**Table 1. Emission factor for the six independent regional mini-grids of The Gambia**

<table>
<thead>
<tr>
<th>Mini-grids</th>
<th>Emission factor tCO$_2$/MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essau</td>
<td>0.8</td>
</tr>
<tr>
<td>Kerewan</td>
<td></td>
</tr>
<tr>
<td>Farafenni</td>
<td></td>
</tr>
<tr>
<td>Kaur</td>
<td></td>
</tr>
<tr>
<td>Bansang</td>
<td></td>
</tr>
<tr>
<td>Basse</td>
<td></td>
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