United Nations Climate Change
Clean Development Mechanism


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# Standardized baseline for electricity sector

This is a sample of how to develop an electricity sector standardized baseline in accordance with the guidelines for establishing sector specific standardized baselines. This standardized baseline will allow to: (1) demonstrate additionality, (2) identify default baseline, and/or (3) establish a baseline emission factor. The standardized baseline is to be used in conjunction with methodology ACM0002: Grid-connected electricity generation from renewable sources.

## Step 1: Identify host country(ies), sectors, output(s) and measures

Country: Moonland
Sector: Electricity sector
Output: Net electricity generation (GWh)
Measure: Measure 2 - Switch of technology with or without change of energy sources (including energy-efficiency improvement).

Moonland energy agency has provided grid data to establish the standardized baseline. Please refer to the table below.

| Plant | Type of power generation arranged in descending order of carbon intensity | Capacity | Default IPCC $CO_2$ emission factor | Power generation | Emissions | Emission Factor |
|---|---|---|---|---|---|---|
| | | MW | $tCO_2/TJ$ | GWh/year | $tCO_2$/year | $tCO_2/GWh$ |
| A | Coal-based | 25 | 94.6 | 186 | 264,147 | 1,419.0 |
| B | Coal-based | 25 | 94.6 | 186 | 243,828 | 1,309.8 |
| C | Diesel generator | 8 | 74.1 | 63 | 44,277 | 702.0 |
| D | Diesel generator | 5 | 74.1 | 37 | 23,938 | 650.6 |
| E | Natural gas turbine | 12 | 56.1 | 44 | 27,864 | 631.1 |
| F | Natural gas turbine | 16 | 56.1 | 98 | 58,279 | 594.0 |
| G | Natural gas turbine | 30 | 56.1 | 210 | 121,314 | 577.0 |
| H | Natural gas based engine | 8 | 56.1 | 62 | 27,678 | 448.8 |
| I | Natural gas based engine | 6 | 56.1 | 44 | 19,153 | 439.0 |
| J | Solar PV | 8 | 0 | 70 | - | - |
| **Total** | | | | **1,000** | | |

## Step 2: Establish additionality criteria for the identified measures

As per paragraph 26 of the guidelines, the cumulative percent of output Oi (1,000 GWh/year, produced based on technologies is arranged in descending order of carbon intensity of the technologies. The following graph is derived.

Glossary:

1. Standardized baseline (SB):
SBs allow a baseline to be calculated only once for an entire class of industry sector as opposed to being calculated separately for each CDM project. Once an SB is approved, project participants can apply this ready-made baseline to their own similar projects.

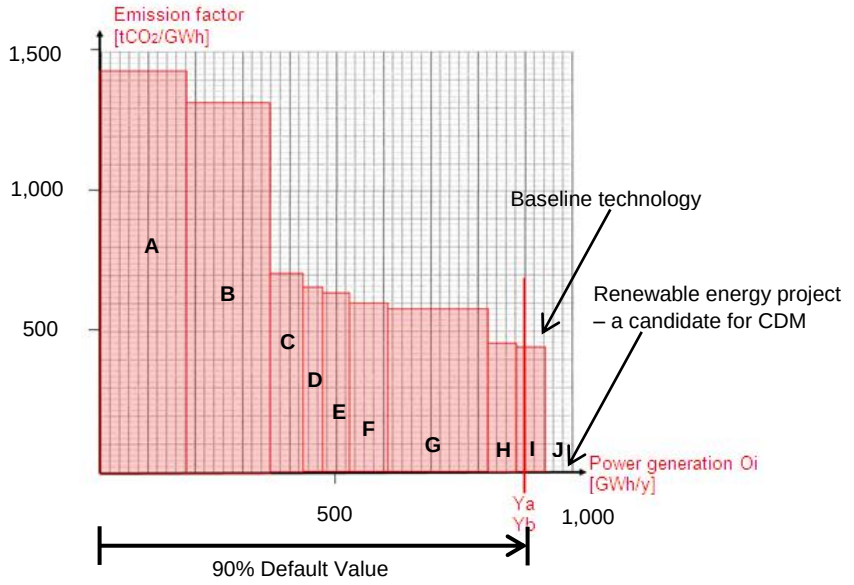
2. Measure:
A broad class of greenhouse gas emission reduction activities with common features. Four types of measures are currently covered in the guidelines issues by the CDM executive board:
   (i) Fuel and feedstock switch;
   (ii) Switch of technology with or without change of energy source (including energy efficiency improvement);
   (iii) Methane destruction;
   (iv) Methane formation avoidance.

3. Output:
A good or service with comparable quality, properties, and application areas (e.g. clinker, lighting, residential cooking).

4. Sector:
A segment of a national economy that delivers defined output(s) (e.g. clinker manufacturing, domestic / household energy supply). The sector is characterized by the output(s) it generates.

5. Ya = Cumulative percent of output Oi for the sector to determine additionality

6. Yb = Cumulative percent of output Oi for the sector to determine baseline




As per Appendix I of the guidelines, Ya is set at 90% of the cumulated output of the sector. Therefore, Ya = 1,000*90% = 900GWh/year. Appendix I also provides a value of three years for the frequency of updates and the three most recent years for the data vintage.

To be deemed additional, technologies need to (1) emit less than 439 tCO2/GWh (e.g. renewable energy), (2) be less commercially attractive, (3) be voluntary by national or sub-national regulation, and (4) consider relevant CDM executive board clarifications.

**Step 3: Identify the baseline for the measures**

As per the Appendix I, Yb is set at 90% of the cumulated output of the sector. Therefore, Yb = 1,000*90% = 900GWh/year. The baseline is a natural-gas-based engine. Emission reduction of CDM projects that replace grid electricity (e.g. a wind farm) can be calculated with reference to this baseline.

**Step 4: Establish a baseline emission factor**

By applying guidelines, the deemed baseline emission factor for the sector (Yb%) would be 439 tCO2/GWh. CDM projects that replace grid electricity (e.g. a wind farm) can calculate their emissions credits (CERs) on the basis of the difference between the emission factor of the electricity grid (439 tCO2/GWh) and the project emission factor, multiplied by the amount of electricity produced.

For details please visit:
https://cdm.unfccc.int/methodologies/standard_base/index.html