



## Annex 23

# GUIDELINES FOR THE ESTABLISHMENT OF SECTOR SPECIFIC STANDARDIZED BASELINES

(Version 02.0)

## I. Background

1. The use of standardized baselines can potentially reduce transaction costs, enhance transparency, objectivity and predictability, facilitate access to the clean development mechanism (CDM), particularly with regard to underrepresented project types and regions, and scale up the abatement of greenhouse gas (GHG) emissions, while ensuring environmental integrity. At the sixth meeting of the conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP 6) in Cancun, Parties agreed to decision 3/CMP.6 on the implementation of standardized baselines under the CDM.<sup>1</sup>

2. The CMP 6 decided that Parties, project participants, as well as international industry organizations or admitted observer organizations through the host country's designated national authority, may submit proposals for standardized baselines applicable to new or existing methodologies, for consideration by the CDM Executive Board (hereinafter referred to as the Board).

3. CMP 6 also requested the Board to develop standardized baselines, as appropriate, in consultation with relevant designated national authorities (DNAs), prioritizing methodologies that are applicable to least developed countries (LDCs), small island developing states (SIDS), Parties with 10 or fewer registered CDM project activities as of 31 December 2010 and underrepresented project activity types or regions, inter alia, for energy generation in isolate systems, transport and agriculture.

4. In response to the request from the CMP 6, the Board requested the secretariat to develop a general methodological framework for the development and assessment of standardized baselines.<sup>2</sup>

## II. Scope and applicability

5. This framework is applicable to sectors where project activities are implemented for stationary sources.<sup>3</sup> It provides guidelines for the development and assessment of standardized baselines including additionality demonstration, baseline scenario identification and baseline emission determination. Specifically, determination of baseline emission factors and positive lists of additional measures, for a sector or part of a sector, in a country or a group of countries is covered, recognizing that one or several measures for GHG emission reduction may be undertaken within a sector. This framework allows for setting baselines that are not necessarily specific to one type of project activity in a sector, but can be applicable to most of the possible project activities in a sector. Additionality is not to be demonstrated for each individual project activity ex-post (after its formulation) but rather for types of measures and ex-ante.

6. The framework is not exhaustive. It allows for exceptions and it may not be applicable to certain sectors or types of emission reduction activities in its current form (e.g. the transport sector is currently not

<sup>1</sup> <<http://unfccc.int/resource/docs/2010/cmp6/eng/12a02.pdf#page=2>>.

<sup>2</sup> EB 60 paragraph 39a.

<sup>3</sup> These project activities do not include those related to afforestation or reforestation.



covered). Project participants or other stakeholders may propose revisions that further expand its applicability to include other approaches and measures. .

7. In summary, this framework aims to elaborate consistent approaches to several types of measures, however is not mandatory and developers of standardized baselines are free to use other relevant approaches.

### III. Definitions

8. For the purpose of this framework, the following definitions apply:

- (a) **Level of aggregation** - The level of aggregation measures the extent to which consolidation of information from any parts or units to form a collective whole is undertaken. This consolidation is usually done within a common sector, to provide information at a broader level to that at which detailed observations are taken. Information on categories can be grouped or aggregated to provide a broader picture when this does not lead to misrepresentation. It can also be split or disaggregated when finer details are required by too much non-homogeneity;
- (b) **Measure** (for emission reduction activities) - a broad class of GHG emission reduction activities possessing common features. Four types of measures are currently covered in the framework:
  - (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.<sup>4</sup>
- (c) **Output** - goods or services with comparable quality, properties, and application areas (e.g. clinker, lighting, residential cooking);
- (d) **Positive lists** - lists of emission reduction activities that are considered automatically additional under certain conditions (e.g. location, technology / measure, size);
- (e) **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)  $O_i$  it generates;
- (f) **Standardized baseline** - a baseline established for a Party or a group of Parties to facilitate the calculation of emission reduction and removals and/or the determination of additionality for clean development mechanism project activities, while providing assistance for assuring environmental integrity.<sup>5</sup>

<sup>4</sup> An example of methane formation avoidance is the use (e.g. for energy generation) of biomass that would have been left to decay in a solid waste disposal site. The measure prevents the formation of methane.

<sup>5</sup> Decision 3/CMP.6.



#### IV. Overview of the approach for standardized baseline and additionality

9. Selecting an appropriate level of aggregation is important to ensuring that the standardized baseline is representative of the applicable projects. Geographical parameters may account for a substantial portion of the differences in GHG intensities and the cost of and potential for emission reductions. Local conditions can have a large influence on the level of baseline emissions and whether a project (type) is additional.<sup>6</sup>

10. Fuel/feedstock switches are conducted for a given technology.

11. The baseline technology and the baseline energy source are to be identified simultaneously and the positive list is a positive list of technologies using given energy sources.

12. For grid connected electricity generation where information on the output (i.e., electricity generated) and the fuels consumed by individual power plants are available, it may be preferable to establish the baseline emission factor for the sector based on the actual emissions of the connected power plants instead of baseline technology under the design conditions, as specified by the “Tool to calculate the emission factor for an electricity system”.

13. According to this framework, additionality may be demonstrated *ex ante* for a variety of measures rather than for each proposed project activity. For project activities that include multiple types of independent measures, the additionality of each measure is demonstrated by checking against the positive list of measures. If the implementation of one measure m<sub>1</sub> (e.g. electricity generation using landfill gas) requires the implementation of another measure m<sub>2</sub> (e.g. destruction of the methane contained in the landfill gas) then the two measures are inherently linked. In this case, the additionality is demonstrated for the group of linked measures collectively as well as for each measure separately e.g. electricity generation from landfill gas and destruction of methane in the landfill gas. If m<sub>1</sub> is not additional, then m<sub>2</sub> cannot be additional.

14. In essence, additionality is not required to be demonstrated for each individual project activity *ex-post* (i.e., after its formulation) but rather for types of measures and *ex-ante*.

#### V. Steps for establishing standardized baselines

15. The following steps should be applied to establish standardized baselines for each of the four measures:

- (a) Step 1: Identify host country(ies), sectors, output(s) and measures;
- (b) Step 2: Establish additionality criteria for the identified measures (e.g. positive lists of fuels /feed stocks and technologies);
- (c) Step 3: Identify the baseline for the measures (e.g. baseline fuel, technology, level of GHG destruction);
- (d) Step 4: Determine the baseline emission factor where relevant.

---

<sup>6</sup> It is recommended that readers consult ‘Chapter 2, Approaches to Data collection, 2006 IPCC Guidelines for National Greenhouse Gas Inventories’.



## A. Measure 1: Fuel and feed stock switch

### *Level of aggregation*

16. The relevant region is the geographical area of the sector producing the output  $O_i$  in a country or a group of countries. If there are fuels/feedstocks that are not available to some regions within the country<sup>7</sup>, further disaggregation is needed and additionality and baseline fuels/feedstocks should be established for regions where the same set of fuels/feedstocks are available.<sup>8</sup> Other levels of aggregation may be proposed to the Board if considered more appropriate.

### *Additionality demonstration*

17. The cumulative percent of output  $O_i$  produced based on the fuels /feedstocks is arranged in descending order of carbon intensity of the fuels /feedstocks (see example 2 below)..

18. Fuels /feedstock with lower carbon intensity than the fuels /feedstock used to produce aggregately, more than  $X_a$  % of the output  $O_i$  of the sector based on technology(ies)  $T_j$ , but facing barriers or that are less commercially attractive, should be included in the positive list of fuels/feedstocks. A switch to any of the fuels/feedstocks in the positive list using technology(ies)  $T_j$  is deemed to be additional.

19. Fuels/feedstock are deemed less commercially attractive if their price per unit of output is higher than that of all fuels/feedstocks used to produce aggregately more than  $X_a$ % of the output(s)  $O_i$  of the sector based on technology(ies)  $T_j$ , and

- (a) There is no national or sub-national enforced regulation mandating use of the fuels/feedstock;
- (b) The Board clarifications on the consideration of national and or sectoral policies and circumstances in baseline scenarios is taken into account.

### *Baseline identification*

20. Identify the fuels with the highest carbon emission factors and contributing to produce in aggregate  $X_b$ % of the output  $O_i$  produced in the sector based on technology(ies)  $T_j$ . The fuel with the lowest carbon emission factor among them is the baseline fuel.

### *Baseline emission factor*

21. The baseline emission factor shall be determined based on the baseline fuel /feedstock identified above.

22.  $X_a$  and  $X_b$  are sector specific and should be defined by the Board starting with the sectors considered as priority sectors. The vintage for the calculation as well as the frequency of the update of the percentage of output produced based on the different fuels are also sector specific and should be defined by the Board.

---

<sup>7</sup> For example natural gas may only be available to some regions covered by a distribution network for natural gas.

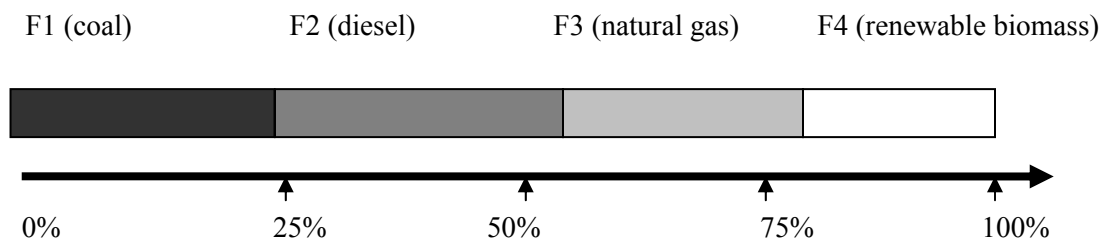
<sup>8</sup> Other means of aggregation may be proposed.

*Examples of standardized baselines*

23. Example 1. In country C, fuel switches to diesel, natural gas or biomass for the production of clinker are additional. The baseline fuel for clinker production in country C is coal.

24. Example 2.

Fuel is arranged in descending order of carbon intensity from F1 to F4. Based on the following Figure, if Xa % is set by the Board at 75% then fuel F4 is additional. If Xb is set by the Board at 50% then the baseline fuel is F2 (diesel).



**B. Measure 2: Switch of technology with or without change of energy sources  
(including energy efficiency improvement)**

*Level of aggregation*

25. The relevant region is the geographical area of the sector producing the output O in a country or a group of countries.<sup>9</sup> Other levels of aggregation may be proposed to the Board if considered more appropriate.

*Additionality demonstration*

26. The cumulative percent of output  $O_i$ , produced based on technologies is arranged in descending order of carbon intensity of the technologies.

27. Technologies that have lower greenhouse gas intensity than any of the technologies used to produce aggregately more than Ya % of the output(s)  $O_i$  of the sector and are less commercially attractive than any of these technologies, are deemed additional.

28. Technologies are deemed less commercially attractive if their cost per unit of output is higher than that of all technologies used to produce aggregately more than Ya % of the output(s)  $O_i$  of the sector, and

- (a) There is no national or sub-national enforced regulation mandating the use of these technologies;
- (b) The Board clarifications on the consideration of national and or sectoral policies and circumstances in baseline scenarios is taken into account.

<sup>9</sup> Other means of aggregation may be proposed.

*Baseline identification*

29. Identify the technologies with the highest emission factors and contributing to produce in aggregate  $Y_b\%$  of the output  $O_i$  produced in the sector. The technology with the lowest carbon emission factor among them is the baseline technology.

30.  $Y_a$  and  $Y_b$  are sector specific and should be defined by the Board starting with the sectors considered as priority sectors. The vintage for the calculation as well as the frequency of the update of the percent of output produced based on the different technologies are also sector specific and should be defined by the Board.

*Baseline emission factor*

31. The baseline emission factor shall be determined based on the baseline technology identified above.

*Examples of standardized baselines*Example 1

32. In country C1, a switch to electricity generation from mini or micro hydro technology is additional:

- (a) To displace diesel generation in off-grid locations with corresponding emission factor (EF) of  $X \text{ tCO}_2/\text{MWh}$ ;
- (b) To displace grid electricity in other locations with corresponding grid emission factor.

Example 2

33. In country C2, technology switches to improved cook-stoves with efficiency higher than  $P\%$  are additional. The baseline cook-stove (CSb) is a cook-stove with efficiency of  $P_b\%$ .

**C. Measure 3: Methane destruction**

34. This measure may include methane destruction in landfill, biogas digesters to treat manure or wastewater including recovery, flaring, and use of methane captured.

*Level of aggregation*

35. The level of aggregation is a region (within a country), a country, or a group of countries where the required level of methane destruction is the same.<sup>10</sup>

*Additionality demonstration*

36. If the level of methane destruction undertaken by a measure is higher than what is mandatory and enforced in the area defined under paragraph 34 above, then that measure of methane destruction is additional.

---

<sup>10</sup> Other means of aggregation may be proposed.

*Baseline identification*

37. The baseline level of destruction in the area defined under paragraph 34 above is the percentage of methane formed that is mandated and enforced for destruction.

38. Baseline emissions may be determined based on the monitoring of the actual amount of methane captured.

*Example of standardized baselines*

39. In country C1, the regulation requires the capture and destruction of A1% of the landfill gas and is enforced. Any capture and destruction of methane emitted from landfill above A1% is additional.

**D. Measure 4: Methane formation avoidance**

40. This measure may include landfill aeration to avoid anaerobic conditions, composting, and use of agriculture residues that would have been left to decay in a solid waste disposal site.

*Level of aggregation*

41. The level of aggregation is a region (within a country), a country, or a group of countries where the sources forming methane are disposed and treated with similar methods.<sup>11</sup>

*Additionality demonstration*

42. If the proposed disposal and treatment method is either not mandatory or not enforced, but faces barriers or is not financially attractive, then the measure is additional.

*Baseline identification*

43. The baseline is the most commonly used disposal and treatment method. The corresponding EF is determined from the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site” or relevant IPCC methods, or from peer reviewed literature.

*Example of standardized baselines*

44. In country C, avoiding methane emissions through composting of green waste is additional.

45. The baseline disposal and treatment method for green waste is landfilling. The related methane EF is determined from first order decay model of IPCC.

**VI. Emission factors for a sector**

46. When multiple measures are simultaneously applied in a sector or in a section of the sector it is necessary to derive a baseline emission factor that integrates the combined effect of all the measures applied and other influencing factors e.g. fuel/feed stock and respective Net Calorific Values (NCV), baseline technology and its design features such as electricity/heat consumption/generation capacity, grid emission factor of electricity consumed. For example in the cement sector there can be several GHG emission reduction actions associated with cement production such as: a) substitution of fossil fuels with alternative fuels, b) use of alternative raw materials, c) decrease of the clinker content in the cement

---

<sup>11</sup> Other means of aggregation may be proposed.



production mix, d) energy efficiency improvements and e) electricity generation from waste heat and renewable energy. A baseline emission factor for this sector in a region may be determined through a calculation based on the following information: baseline fuel/feed stock and its carbon emission factor and NCV, baseline technology particularly its specific fuel/ feed stock/electricity consumption per its design and the grid emission factor of the electricity.

47. When applying one or more of the measures described in preceding sections in a sector, one may encounter a situation where the sector as a whole may not be homogenous however it is possible to disaggregate the sector into homogenous sections. In such instances separate emission factors are established for each of the homogenous section depending on the level of aggregation used in the identification of the baseline fuel /feed-stock, technology etc.<sup>12</sup>

48. Notwithstanding the above, in cases where data from the operations of units in the sector needed to calculate the current emission factor of output  $O_i$  is available and easily accessible, then the emission factor may be calculated using these data instead of the approach proposed above.

---

<sup>12</sup> For example, if for fuel switch the sector at the country level has to be further disaggregated into two parts (e.g. the country is divided into two sub-regions).



## Appendix I

1. The following interim values shall be used in these Guidelines for the data vintage, the frequency of update and for Xa, Xb, Ya, Yb

Sectors	Xa	Xb	Ya	Yb	Data vintage	Frequency of updates
Energy for household; Energy generation in isolated systems; Agriculture	80%	80%	80%	80%	Most recent 3 years	3 years
Other sectors	90%	90%	90%	90%	Most recent 3 years	3 years

2. All the standardized baselines developed based on these interim values shall have an identification code in their version number.

3. The baseline of CDM projects using standardized baselines developed based on these interim values shall be updated after three years, using the most recent standardized baselines with updated values of X and Y.

-----

## History of the document

Version	Date	Nature of revision(s)
02.0	EB 65, Annex 23 25 November 2011	Revision to incorporate an appendix defining the vintage of data and the frequency of update, Xa, Xb, Ya and Yb.
01.0	EB 62, Annex 8 15 July 2011	Initial adoption.

**Decision Class:** Regulatory  
**Document Type:** Guideline  
**Business Function:** Methodology