CLEAN DEVELOPMENT MECHANISM

CDM-MP76-A17

Draft Guideline

Establishment of sector specific standardized baselines

Version 04.0

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. At the eighty-ninth meeting of the Executive Board of the clean development mechanism (CDM) (hereafter referred to as Board), the Board requested the Methodologies Panel (MP) to incorporate clarifying elements as previously included in the concept note “Package on further development of a standardized baseline framework” into the "Guidelines for the establishment of sector specific standardized baselines" (hereafter referred to as SB guidelines) without revising any of the existing approaches in the guidelines.

2. The MP 75 agreed to launch a call for public input on draft SB guideline. One input was received during the call for public input.

2. Purpose

3. The purpose of this document is to revise the SB guidelines to incorporate clarifying elements as well as to address relevant comments received during the call for public input.

3. Key issues and proposed solutions

4. At MP76, the Panel took note of a comment received from the public on the relevance of the defined values for Xa, Xb, Ya, Yb. Considering that the SB Guidelines states that these parameters are defined by the Board, the Panel recommended its consideration by the Board at its next meeting.

4. Impacts

5. The revision to the SB guidelines will enhance the clarity and facilitate the application by SB developers.

5. Subsequent work and timelines

6. The guideline is recommended by the MP for consideration by the Board at its hundredth meeting. No further work is envisaged.

6. Recommendations to the Board

7. The MP recommends that the Board adopt this draft guideline.

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1. Introduction

1.1. Background

1. The use of standardized baselines (SB) can potentially reduce transaction costs, enhance transparency, objectivity and predictability, facilitate access to the clean development mechanism (CDM), particularly with regard to under-represented 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.[1]

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 under-represented 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.[2]

2. Scope, applicability, and entry into force

2.1. Scope and applicability

5. Three approaches below may be ~~possibly~~ applied for the development of a SB. The guidance provided in this framework is applicable for the development of SBs using approach 3. This framework may be applicable for approach 1 or 2, especially if relevant requirements and guidance are not provided in the approved methodologies or tools:

   (a) **Approach 1:** A SB may be developed using a methodological approach in the approved CDM methodologies,[3] in particular the approaches for baseline scenario identification, additionality demonstration and baseline emissions;

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

[2] EB 60 paragraph 39a.

[3] For example, AM0070 "Manufacturing of energy efficient domestic refrigerators" can be used to develop a standardized baseline, e.g. the baseline scenario and the baseline emission factor for a particular refrigerator class of a country. If a suitable approved methodology is not available, a new methodology or a revision of an approved methodology may be submitted in accordance with the "Procedure for development, revision and clarification of baseline methodologies and methodological tools".

(b) **Approach 2:** A SB emission factor may be developed using a methodological approach in approved CDM methodological tool;[4]

(c) **Approach 3:** A SB may be developed based on an approach covering three dimensions[5]: performance, market penetration and cost/barrier.

6. This framework is applicable to sectors where project activities are implemented for stationary sources.[6] It provides guidelines for the development and assessment of SBs ~~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.

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

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

2.2. Entry into force

9. The date of entry into force is the date of the publication of the EB XX meeting report on DD Month YYYY.

3. Normative references

10. Relevant provisions from the recent versions of the following documents should be applied when this standard is implemented, which are all available at <http://cdm.unfccc.int/methodologies/standard_base/index.html>:

(a) "Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines": DNAs should ensure that the data quality for the development of SBs is in accordance with the data quality objectives

[4] For example, the "TOOL07: Tool to calculate the emission factor of an electricity system" can be used to determine an emission factor for the grid of a country or region. This emission factor can be used to calculate baseline emissions (and project emissions/leakage emissions) of CDM projects applying a CDM methodology that refers to this tool.

[5] One of these three dimensions might be more influential than the other two. In that case, SB developer should justify in the SB proposal how one of the dimension is more prominent.

[6] These project activities do not include those related to afforestation or reforestation.

and documentation provisions as well as the stepwise guidance specified in the guidelines;

(b) "Procedure for development, revision, clarification and update of standardized baselines";

(c) "Standard for determining coverage of data and validity of standardized baselines": DNAs should comply with the data coverage and currentness requirements when developing SBs and should update approved SBs in a timely manner in accordance with the requirements specified in this standard;

(d) Standard for "Sampling and surveys for CDM project activities and programme of activities";

(e) "TOOL07: Tool to calculate the emission factor for an electricity system";

(f) "TOOL04: Emissions from solid waste disposal sites";

(g) "TOOL02: Combined tool to identify the baseline scenario and demonstrate additionality";

(h) "TOOL21: Demonstration of additionality of small-scale project activities";

(i) "Guidelines for objective demonstration and assessment of barriers".

4. Definitions

11. The definitions contained in the Glossary of CDM (CDM-EB07-A04-GLOS) terms shall apply.

12. In addition, ~~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;

(b) 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;

(c) **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;[7]

(d) **Output** - goods or services that are delivered/provided to external customers, with comparable quality, properties, and application areas (e.g. clinker, street lighting, residential cooking, milled rice, solid waste collection and disposal, wastewater treatment, etc.);

(e) **Facility** - a set of equipment and associated process to provide the output for which the SB is to be developed. If one plant produces two outputs in two separate processes with separate feedstock and energy inputs and both outputs are for consumption outside the facility, these two processes of the plant are considered to be two separate facilities; for example, one steel production plant would be divided into a cold-rolled steel facility and a hot-rolled steel facility;

(f) **Positive lists** - lists of emission reduction activities that are considered automatically additional under certain conditions (e.g. location, technology / measure, size);

(g) **Sector** - a segment of a national economy, comprising facilities within the defined level of aggregation (e.g. all the power generation facilities connected to the national or regional grid, all the facilities to produce charcoal for consumption in households and facilities of small/medium-sized enterprises in the country or region, all the small/medium-sized rice mill facilities in a country). ~~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 and may also provide a service (in comparison to "goods"). For example, ~~T~~the waste or wastewater management sector provides a service for the collection, treatment and disposal or recycling of solid waste or wastewater, either as a public service (e.g. municipal solid waste or sewage utility or entity), as a service provided to individual customers by an informal/formal sector entity or individuals, or as an internal service within a private entity (e.g. an industry);

(h) **Standardized baseline (SB)** - 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 (CDM) project activities, while providing assistance for assuring environmental integrity.[8]

5. Development of Standardized Baseline

5.1. Overview of the approach for standardized baseline and additionality

13. ~~Selecting an appropriate level of aggregation is important to ensure that the SB standardized baselines is representative of the applicable types of project activities. 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~~

[7] 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.

[8] Decision 3/CMP.6.

~~additional.~~[9] The DNAs may propose the level of aggregation, taking into account the following guidance:

(a) The default level of aggregation may comprise the facilities producing the same output in one country. It may be expanded to a group of countries under similar circumstances with regard to the output.[10] Similarly, the SB could be restricted to a region of a country;

(b) The default group of facilities could be disaggregated if a significantly dissimilar performance exists among groups of the facilities in the country because of differences in criteria such as production scale (or installed capacity) or age of the facilities.[11] In this case, it may be appropriate to disaggregate the facilities according to the criteria, and then propose a SB for each group of similar facilities or for one prioritized group if resources are limited;

(c) The selection of the final level of aggregation may be an iterative process;

(d) Disaggregation should not result in SBs with overlapping applicability (e.g. overlap would occur in the case of an SB for energy efficiency in commercial buildings, and another SB for energy efficient lighting in commercial and residential buildings).

~~14. Fuel/feedstock switches are conducted for a given technology.~~

15. A SB developed under this framework may be for a target measure (e.g. fuel switch, feedstock switch, or technology switch). Depending on the target measure,[~~12~~] the SB may be based on the GHG performance of the fuel (e.g. tCO_2/GJ), feedstock (e.g. $tCO_2/tFeedstock$) or the energy efficiency of technology (e.g. GJ/tOutput) of the facilities of the sector and is applicable to project activities implementing a fuel switch, feedstock switch or technology switch in the sector.

16. The target measure should be clearly defined. For example, target measure is defined as a technology switch that requires the change of key equipment/technology ~~that~~ governing~~s~~ the technical specification of a facility and determines the GHG performance of the facility (e.g., a new storage tank or pipeline in a cement kiln should not be regarded as technology switch) or it is defined in terms of an input or output ratio.

17. ~~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~~. The SB developed under this framework should result in a country-specific or region-specific positive list of technologies, fuels and/or feedstock, whereby all technologies/fuels/feedstocks, in the positive list are additional. By applying a positive list,

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[9] ~~It is recommended that readers consult 'Chapter 2, Approaches to Data collection, *2006 IPCC Guidelines for National Greenhouse Gas Inventories*'.~~

[10] Refer to the approved standardized baseline ASB0001 for which the level of aggregation comprises power generation facilities from a group of countries.

[11] A DNA may propose other criteria for disaggregation which may demonstrate dissimilar performance.

[12] ~~The target measure should be clearly defined. For example, a technology switch requires the change of key equipment/technology that governs the technical specification of a facility and determines the GHG performance of the facility (e.g., a new storage tank or pipeline in a cement kiln should not be regarded as technology switch).~~

further demonstration of additionality is not required when seeking registration of a project. The development and application of positive lists should take into account the following guidance:

(a) The positive lists should not be limited to technologies/fuels/feedstock available and used in the country/region, and may include other technologies/fuels/feedstock not yet available or used in the country/region that meet all the criteria for positive lists (e.g. performance, and barrier or cost);

(b) For facilities involving one piece of equipment, such as a 1MW wind turbine, the identification of technologies may be relatively straightforward. For facilities involving multiple pieces of equipment and integrated processes, the differentiation of technologies may be based on the technical features of the key equipment of the facilities, their performance and their levelized costs, so that the ranges of performance and costs of one technology do not overlap ~~significantly~~ with those of another technology, thus facilitating the comparison of performance and costs where applicable;

(c) When the target measure involves a combination of technologies/fuels/feedstock, for example installation of both an efficient gas turbine and a waste heat recovery boiler, the positive list also should address eligible combinations (for further guidance, refer to section 5.7 below).

18. The production and manufacturing sectors, as well as the waste and wastewater management sector, may have multiple outputs. Each SB is developed to be applicable to one output, and the emissions and performance data are collected for that output. If multiple outputs (including main product, co-product and by-product) are produced simultaneously with some common feedstock and/or energy inputs at the same facility, it may not be possible to allocate the emissions to each of the multiple outputs and to develop SB for those outputs. Taking into account the circumstances of the country and the production process and equipment of the facility producing multiple outputs, an approach of apportioning or aggregation may be proposed and proper justification for conservativeness should be provided. The following examples may be considered in this regard:

(a) Emissions may be apportioned between sugar production and ethanol production in the sugar sector. The DNA may propose to allocate one part of the feedstock and energy inputs and their emissions to the sugar facility as a facility covered under the sugar sector SB and another part to the ethanol production facility as a facility covered under the ethanol sector SB. If the sugar mill exports electricity based on bagasse or biogas, grid electricity may also be a co-product. In this case, the part of the facility's emissions due to the generation of electricity that is supplied to the grid should be allocated to the facility and considered in the context of the grid electricity SB;

(b) One SB may be developed only for one main output identified in a sector. The DNA may propose a conservative approach to convert the production of other co-products or by-products to the production of the main product, and allocate all the feedstock and energy inputs and their emissions to this facility for the SB of the main output. This option may be applicable to the example case of biodiesel production facilities with glycerine as a by-product.

19. 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 "TOOL07: Tool to calculate the emission factor for an electricity system".

20. ~~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_1 (e.g. electricity generation using landfill gas) requires the implementation of another measure m_2 (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_1 is not additional, then m_2 cannot be additional.~~

21. ~~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*.~~

22. ~~The project activities may implement multiple measures, which may be covered by (a) multiple SBs or (b) a combination of SB and CDM methodology.~~ The guidance for the application of a SB to such projects is provided in the context of the following example. Consider a project activity that involves animal manure treatment and biogas-based power generation. In such a case, the waste sector SB may only conclude that the measure of anaerobic digestion of animal manure is additional and one of the following options should be applied for determining the baseline and additionality of the energy component:

    (a) Refer to an existing SB developed for electricity generation, if available;

    (b) If no such SB is available, develop a new SB for electricity generation; or

    (c) Use the applicable CDM methodologies for the emission reduction (and/or additionality) due to displacing more carbon-intensive electricity generation with biogas-based power generation.

23. The facilities considered for establishing standardized baselines should not be older than 25 years. The data and information related to performance and market penetration that will be collected from each of the operational facilities should be collected in line with requirements from the Standard 'Determining coverage of data and validity of standardized baselines' and from the Guidelines 'Quality assurance and quality control of data used in the establishment of standardized baselines'. ~~As for data and information collection, the following performance and market penetration information should be collected for each operational facility (s) of data for the development of the SB.~~ The collection of information should cover either all facilities in the sector or a sample of the facilities as determined by the standard "Sampling and surveys for CDM project activities and programme of activities", according to the defined level of aggregation:

    (a) Activity data, including the actual output (Oi) production and the actual consumptions of fuels, electricity and feedstock by types/sources;

(b) Parameters that describe the properties or characteristics of fuels and feedstocks, such as net calorific values, fuel/electricity/feedstock emission factors;

(c) As an alternative to (a), empirical data on energy and feedstock consumption, design data on specific energy consumption (e.g. GJ/t output, GWh/t output) and/or design data on specific feedstock consumption (e.g. t feedstock/t output);

(d) General information on the facilities such as name, location, year of establishment/upgrading/expansion, design production capacity and description of equipment.

5.2. Steps for establishing standardized baselines

24. The following steps should be applied to establish SBs ~~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.

25. In particular, the following should be taken into account for the development of SBs for Measure 1 or Measure 2:

(a) To rank the performance, the GHG performance of the facilities should be represented, not by overall performance, but by a parameter relevant for the measure, e.g. the GHG performance for fuel switch measure is tCO_2/GJ of the fuels used at the facility;

(b) To demonstrate that fuel/technology/feedstock is/are additional, a positive list may be developed for the relevant measure;

(c) To calculate the baseline emissions of a fuel switch measure, the project participants for each project activity may multiply the following three parameters, unless otherwise specified in the methodology that is used in conjunction with the proposed SB:

(i) The emission factor (tCO_2/GJ) of the baseline fuel;

(ii) The energy efficiency (GJ/~~t~~Output) of the technology at the project facility, for which a fuel switch measure is implemented. If the energy efficiency of the technology varies with the fuel, the energy efficiency corresponding to the baseline fuel should be used;

(iii) The output produced by the project activity.

5.3. Measure 1: Fuel and feed stock switch

5.3.1. Level of aggregation

26. 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,[13] further disaggregation is needed and additionality and baseline fuels/feedstocks should be established for regions where the same set of fuels/feedstocks are available.[14] Other levels of aggregation may be proposed to the Board if considered more appropriate.

5.3.2. Additionality demonstration

27. 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 in Appendix 2 below).

28. Fuels/feedstock with lower carbon intensity than the fuels/feedstock used to produce aggregately, more than Xa % of the output O_i of the sector based on technology(ies) T_j, but facing barriers[15] 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.

29. Fuels/feedstock are deemed less commercially attractive[16] if their price per unit of output is higher than that of all fuels/feedstocks used to produce aggregately more than Xa% 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.

5.3.3. Baseline identification

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

5.3.4. Baseline emission factor

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

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[13] For example, natural gas may only be available to some regions covered by a distribution network for natural gas.

[14] Other means of aggregation may be proposed.

[15] "Guidelines for objective demonstration and assessment of barriers" and guidance given for barrier analysis in "TOOL02: Combined tool to identify the baseline scenario and demonstrate additionality" should be taken into account.

[16] The financial analysis should be based on parameters that are standard in the sector, but not necessarily linked to the costs incurred at an actual facility.

32. Xa and Xb 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.

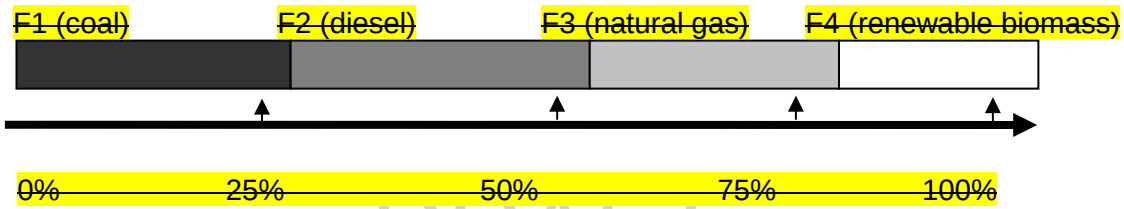
~~**5.3.5 Examples of standardized baselines**~~

~~**5.3.4.1. Example 1**~~

~~33. 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.~~

~~**5.3.4.2. Example 2**~~

~~34. 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).~~



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

5.4.1. Level of aggregation

35. The relevant region is the geographical area of the sector producing the output O in a country or a group of countries.[17] Other levels of aggregation may be proposed to the Board if considered more appropriate.

5.4.2. Additionality demonstration

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

37. 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.

38. 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;

[17] Other means of aggregation may be proposed.

(b) The Board clarifications on the consideration of national and or sectoral policies and circumstances in baseline scenarios is taken into account.

5.4.3. Baseline identification

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

40. Ya and Yb 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.

5.4.4. Baseline emission factor

41. The baseline emission factor ~~shall~~ should be determined based on the baseline technology identified above.

~~**5.4.5. Examples of standardized baselines**~~

~~**5.4.5.1. Example 1**~~

~~42. In country C1, a switch to electricity generation from mini or micro hydro technology is additional:~~

~~43. To displace diesel generation in off-grid locations with corresponding emission factor (EF) of X tCO2/ MWh;~~

~~44. To displace grid electricity in other locations with corresponding grid emission factor.~~

~~**5.4.5.2. Example 2**~~

~~45. In country C2, technology switches to improved cookstoves with efficiency higher than P% are additional. The baseline cook-stove (CSb) is a cookstove with efficiency of Pb%.~~

5.5. Measure 3: Methane destruction

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

5.5.1. Level of aggregation

47. 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.[18]

5.5.2. Additionality demonstration

48. If the level of methane destruction undertaken by a measure is higher than what is mandatory and enforced in the area defined under paragraph 38 above, then that measure of methane destruction is additional.

[18] Other means of aggregation may be proposed.

5.5.3. Baseline identification

49. The baseline level of destruction in the area defined under paragraph 38 above is the percentage of methane formed that is mandated and enforced for destruction.

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

~~**5.5.4. Example of standardized baselinesin**~~

~~51. 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.~~

5.6. Measure 4: Methane formation avoidance

52. 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.

5.6.1. Level of aggregation

53. 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.[19]

5.6.2. Additionality demonstration

54. 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.

5.6.3. Baseline identification

55. The baseline is the most commonly used disposal and treatment method. The corresponding EF is determined from "TOOL04: Emissions from solid waste disposal sites" ~~"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.

5.7. Emission factors for a sector

56. 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 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

[19] Other means of aggregation may be proposed.

information: baseline fuel~~/feed stock~~ and its carbon emission factor and NCV, baseline feed stock and its carbon emission factor, baseline technology particularly its specific fuel/ feed stock/electricity consumption per its design and the grid emission factor of the electricity.

57. 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.[20]

58. 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.

[20] 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 1. ~~Interim~~ ~~v~~Values for Xa, Xb, Ya, Yb

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:

Table 1. ~~Interim~~ V~~v~~alues 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~~.

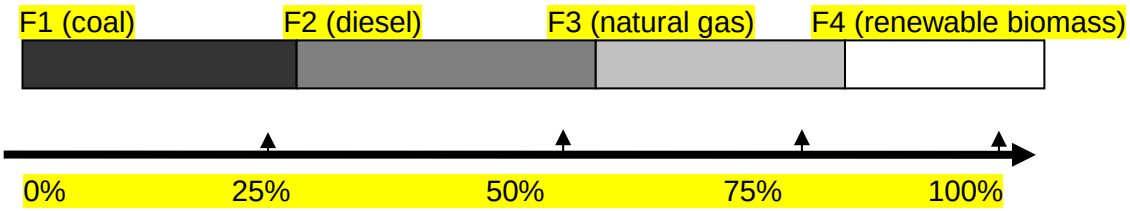
~~3. The baseline of CDM projects using standardized baselines developed based on these interim values shall be updated after three years, using the most recent standardized baselines with updated values of X and Y.~~

Appendix 2. ~~Two e~~Examples for development of standardized baselines

1. ~~Example 1~~Fuel and feed stock switch

1. 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.

2. 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).



2. Switch of technology

3. Example 1 - 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 tCO2/ MWh;

(b) To displace grid electricity in other locations with corresponding grid emission factor.

4. Example 2 - In country C2, technology switches to improved cookstoves with efficiency higher than P% are additional. The baseline cook-stove (CSb) is a cookstove with efficiency of Pb%.

5. Example 3 - An SB is to be developed for the technology switch measure for the residential interior lighting sector. The output of interior lighting for residential buildings can be measured in lumen-hours.

6. The default level of aggregation includes all the interior lighting installations of residential buildings of country A.

7. The following data are collected from each of a sample of 200 interior lighting installations (referred to as lamps) in country A:

(a) One year of activity data: annual usage hours;

(b) Information on whether the lamp consumes the electricity from the grid or an off-grid generator;

(c) The design-specific energy consumption (i.e. the reciprocal of the luminous efficacy) in watts per lumen and the lamp power in watts, as the actual electricity consumption of the individual lamps is not monitored;

(d) The type of lamp, address and year of installation.

8. As the positive list may be developed based on "TOOL21: Demonstration of additionality of small-scale project activities" (version 12), cost and barrier information is not needed in this case.

9. If further disaggregation is to be proposed, information related to the possible criteria for disaggregation (such as socioeconomic status of the residents) also needs to be collected and may need to be considered in determining the sampling plan. In this example, no further disaggregation is expected.

10. As all residential buildings in country A are connected to the national grid, the following were considered while deciding to develop a SB for the technology switch measure:

(a) A technology switch from incandescent lamps to light-emitting diodes (LEDs) does not require a switch of the electricity source;

(b) Design-specific energy consumption of the lamps allows distinguishing the impacts of the technology from the impact of energy source (electricity) on the performance of the lamps;

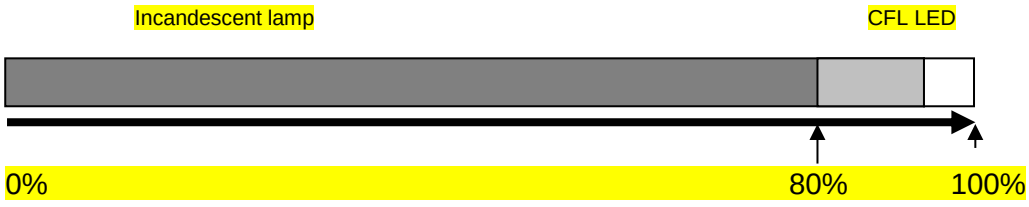
(c) All the lamps can use the electricity provided by the national grid;

(d) The ranking of the energy efficiency of the lamps does not depend on the source of the electricity.

11. In this example, all the lamps are connected to the same national grid. Therefore, the ranking in tCO_2/lumen-hour can be substituted by the ranking in watts per lumen.

12. For each lamp, the output of each lamp (lumen-hours/year) is calculated as the lamp power (watts) x luminous efficacy (lumens/watt) x annual usage hours (hour/year).

13. The 200 lamps are ranked in a bar chart according to their design-specific energy consumption (watts per lumen) and the bar length of each lamp is represented by its output. To simplify the bar chart, the incandescent lamps, the compact fluorescent lamps (CFLs) and the LEDs are grouped together and represented by the total output from each group.



14. The difference in GHG performance is mostly attributed to the difference in technologies and is not found to be correlated with other factors, such as installation year. Therefore, the default level of aggregation was considered as appropriate.

15. The baseline threshold is set at the 80th percentile for this priority sector, i.e. energy for households.

16. CFLs and LEDs are more efficient than the lamp at the 80th percentile and they are considered automatically additional according to "TOOL21: Demonstration of additionality of small-scale project activities" (version 12), and therefore the positive list may consist of CFLs and LEDs.

17. The baseline emissions of a project lamp should be calculated by multiplying the design-specific energy consumption (watts per lumen) of the lamp at the 80th percentile, the annual usage hours of the project lamp, the grid emission factor, the project lamp power (watts) and the luminous efficacy of the project lamp (lumens/watt).

~~18. Example 2~~

19. Example 4 - an SB is to be developed for the cement clinker producing sector in country B.

20. ~~In this example, an SB is to be developed for the cement clinker producing sector in country B.~~

21. The default level of aggregation includes all the clinker producing facilities of country B.

22. The following data are collected from each of the 20 clinker facilities in country B:

    (a) Three years of activity data: the actual clinker production and the actual consumption of fuels and feedstocks;

    (b) Net calorific values and emission factors of fuels from IPCC, emission factors of feedstocks;

    (c) The name, location, year of establishment/upgrading, production capacity and description of equipment (e.g. rotary kilns).

23. In addition, cost information of the fuels, feedstocks and technologies used in the sector is needed.

24. For each facility, the three-year total emissions are calculated from the emission factors and consumption of the fuels and feedstocks. Then all the facilities are ranked in average tCO_2/tClinker from the three years.

25. It is observed that the facilities built in the past five years installed vertical shaft kilns while older facilities installed the more efficient rotary kilns. In such a context, the sector is disaggregated into the 9 facilities built in the past five years and the 11 older facilities, and it was decided that the SB is to be developed based on the newer facilities only.

26. The performances of the 9 newer facilities are ranked by tCO_2/tClinker.

27. The baseline threshold is set at the 90th percentile for this sector, and Facility 8 at the baseline threshold uses pet coke as the fuel, 95%lime+5%clay as the feedstock, and a vertical shaft kiln. There is a Facility 9 above the baseline threshold which uses heavy fuel oil as the fuel, lime as the feedstock and a vertical shaft kiln.

28. The baseline alternative represented by Facility 8 at the 90th percentile is identified as the baseline scenario.

29. Heavy fuel oils and biomass facing barriers are less carbon-intensive than the pet coke used at Facility 8, and both are included in the positive list of fuels.

30. All rotary kiln technologies are less carbon-intensive than the vertical shaft kiln used at the facility at the baseline threshold, and therefore all rotary kiln technologies are included in the positive list of technologies.

31. No positive list of feedstocks is developed in this case.

32. The baseline emissions of a project clinker facility should be calculated by multiplying the emission factor (tCO_2/tClinker) of Facility 8 (baseline scenario) and the annual clinker production of the project clinker facility.

3. Methane destruction

33. Example 1 - 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.

4. Methane formation avoidance

34. Example 1 - In country C, avoiding methane emissions through composting of green waste is additional.

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

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Document information

Version	*Date*	*Description*
04.0	20 June 2018	MP 76, Annex 17 To be considered by the Board at EB100. The draft version of this document (CDM-MP75-A09) was available for public input from 6 April to 20 April 2018. It received one input. Revision to incorporate the guidance from the Board (EB96).
03.0	28 July 2017	MP 73, Annex 16 To be considered by the Board at EB 96. The draft version of this document (CDM-MP72-A15) was available for public input from 7 April to 5 May 2017. It received one input. Revision to incorporate clarifying elements and to improve the overall clarity of this guideline.
02.0	25 November 2011	EB 65, Annex 23 Revision to incorporate an appendix defining the vintage of data and the frequency of update, Xa, Xb, Ya and Yb.
01.0	15 July 2011	EB 62, Annex 8 Initial adoption.

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