DRAFT

Annex 11

DRAFT GUIDELINES ON STANDARDIZED APPROACHES FOR DETERMINING BASELINES FOR MEASURE(S)

(Version 01.0)

I. Background

1. The clean development mechanism (CDM) Executive Board (hereinafter referred to as the Board), in paragraph 41 of the report of its sixtieth meeting mandated:

> "The Board considered the summary of the public inputs to the call on the draft "Tool for baseline scenario identification and baseline emission calculations" and the recommendations of the Meth Panel based on the practitioner's workshop on the draft "Tool for baseline scenario identification and baseline emission calculations". The Board requested the secretariat, in consultation with the Meth Panel, if appropriate, to develop a concept note on a general methodological framework for baseline determination for consideration by the Board at its sixty-fourth meeting."

2. The concept note with an outline of the key features and elements for the guidelines on baseline determination was included on the annotated agenda of sixty-fifth meeting of the Board (EB65 annotations to the proposed agenda - Annex 18) and the Board accepted this concept.

II. Objective and scope

3. There is inconsistency in the approaches applied for baseline determination in some of the existing CDM methodologies (see some examples in Appendix II to this document). The use of a standardized approach for baseline determination will help to avoid such inconsistencies in future.

4. The main objective of these guidelines is to ensure consistency of the approaches used in the determination of baselines in the different methodologies, by providing standardized approaches to determine the baseline for different baseline scenarios (investment situations) and measure(s). The proposed guidelines elaborate when and under which circumstances a baseline based on paragraph 48(a), 48(b) or 48(c)[1] of Modalities and procedures for a clean development mechanism (Decision 3/CMP.1) should be used.

5. These guidelines will provide standardized approaches for determining the baseline for a measure or combination of measures in case the project activity consists of multiple measures. These guidelines will guide the methodology developers, the Methodologies Panel (Meth Panel), the Small-Scale Working Group (SSC WG) and other relevant stakeholders to determine the approaches to identify and evaluate the baseline during the development and/or assessment of methodologies.

6. The underlying approach takes lessons from the best practices followed for baseline determination in existing CDM methodologies, and the rationale used by the Board in approving different methodologies and issuing guidance.

[1] 48(a) Existing actual or historical emissions, as applicable,
48(b) Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment
48(c) The average emissions of similar project activities undertaken in the previous five years, in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20 per cent of their category.

DRAFT

7. This document provides the scope, applicability and definitions of key terms used in the guidelines. There are sections providing approaches and steps to be followed to determine baselines and baseline emissions. Appendix-I provides a matrix with key criteria for the determination of the baseline and appendix-II provides examples of inconsistencies in the approaches followed in some of the existing approved methodologies.

8. This document, however, is not exhaustive and may not cover certain (albeit less likely) situations which may have an impact on the approaches to determine the baselines. Therefore if a project participants justify that the specific situation or situations of their proposal are different from those covered under these guidelines or that there are genuine limitations in following the approaches suggested in these guidelines and that an alternative approach to determine the baseline may be conservative enough, they may deviate from these guidelines. The Board will take this into account when considering the PNM.

III. Applicability

9. These guidelines are applicable to non-afforestation and reforestation (non-A/R) sectors.

IV. Definitions

10. For the purpose of these guidelines, the following definitions apply:

(a) **Measure (for emission reduction activities):** Measure is a broad class of greenhouse gas (GHG) emission reduction activities that possess common features. A project activity can include single or multiple measures. The reason to divide the project activity into multiple measures is that the baseline may change depending upon the measures. Four types of measures are currently covered in the guidelines:

(i) Fuel and/or feedstock switch (example: switch from naphtha to natural gas, or switch from limestone to gypsum in cement clinker production);

(ii) Switch of technology with or without change of energy source (example: energy efficiency improvements, power generation based on renewable energy);

(iii) GHG destruction (example: landfill gas flaring, incineration of HFC23 gas vented from HCFC22 production unit);

(iv) GHG formation avoidance (example: use of biomass that would have been left to decay in a solid waste disposal site resulting in the formation and emission of methane, for energy generation.

(b) **Output:** goods or services with comparable quality, properties, and application areas (e.g. clinker, lighting, residential cooking, waste disposal);

(c) **Project activity:** A non-A/R operation or action that aims to reduce GHG emissions from sources, whether as a whole project or as a part of a project;

(d) **The investment scenario:** The investment scenario represents the most plausible investment among the alternative investment scenarios available to project participants without the CDM. The investment scenario leads to the determination of the baseline. The investment in the CDM project activity involves either an initial capital outlay or the incremental expenses caused by the project activity (e.g. incremental cost of fuels/feedstocks under a fuel/feedstock switch project activity, requiring no capital outlay). The investment scenario(s) for the measure(s) are determined ex ante and should be valid for the crediting period of 21 years or 10 years. The investment scenario should

DRAFT

be determined for the entity that has or would have emitted a higher amount of greenhouse gases in the absence of the project activity. There is a possibility that the entity that implements the project, either through the initial capital outlay, or paying a project implementer (e.g. Energy Service Company (ESCO), a supplier constructing the project on a Build-Own-Operate-Transfer (BOOT) basis), may be different than the entity that has or would have emitted a higher amount of greenhouse gases in the absence of the project activity. For example, if a waste energy recovery project is supplying electricity to a new consumer, the investment scenario for electricity should be identified for the new consumer.

(e) **Baseline:** Baseline is the scenario that most reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity. The baseline is characterized by three approaches: (i) 48(a) – the existing actual or historical emissions, as applicable; (ii) 48(b) – the emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment; (iii) 48(c) – the average emissions of similar project activities undertaken in the previous five years, in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20 per cent of their category. The baseline should be determined for the entity that has or would have emitted a higher amount of greenhouse gases in the absence of the project activity.

V. Steps for determining the baseline for a measure or combination of measures

11. The following steps should be applied to determine the baseline for a measure:

12. **Step 1: Identify the output:** One project activity can have multiple outputs. For example, cogeneration using biomass has three outputs. Thermal energy for on-site processes, electricity for grid export and potentially waste (biomass residue) disposal.

13. **Step 2: Identify the project activity:** The project activity is a coherent set of interrelated activities, which provides all the outputs identified. The project activity, within the project boundary, includes all the measures resulting in the identified output.

14. **Step 3: Identify the number of measures that the project activity encompasses:** One project activity can include more than one measure. For example, a project activity that involves power generation using biomass and supplying the electricity grid includes two measures. The first measure is the generation of electricity and supplying the grid. The second measure is the GHG formation avoidance from the biomass that would have been left to decay in a solid waste disposal site, if applicable.

15. **Step 4: Determine the relationship between measures (if more than one):** The following differentiation of situations can be made based on the interdependencies of measures taken up under the project activity:

(a) ***Situation 1:*** The measures are independent (the measures can be implemented separately)

(i) The investment scenario and the baseline of each measure should be determined separately.

Example: A boiler is retrofitted and in parallel a demand-side steam saving project is taken up in the plant. These measures are completely independent. The investment scenario for each measure should be identified separately.

(b) ***Situation 2:*** The measures are mutually dependent (the implementation of any of them needs the implementation of the others)

DRAFT

(i) The investment scenario should be identified together for all the measures and the baseline identified separately for each measure.

Example: A power plant changes its sub-critical coal-based technology to open cycle natural gas turbine technology. The project activity involves a technology switch measure and fuel switch measure, which are completely dependent on each other and cannot take place in isolation.[2] The investment scenario for both these measures should be identified together. It should be noted that this situation is already covered by the measure in paragraph 10(a)(ii) above, by ensuring a global definition of the measure itself.

(c) ***Situation 3:*** The implementation of some measures (e.g. type A) requires the implementation of other measures (e.g. type B), but not vice versa.

(i) The investment scenario of measure type A determines the investment scenario of measure type B.

Example: The project activity of grid-based power generation using landfill methane that was vented in the absence of the project activity involves two measures: methane destruction, and greening of the grid by supplying clean fuel power. The measure of power generation requires the destruction of methane, whereas the methane destruction can occur with or without power generation. Therefore, the determination of the investment scenario of power generation will also determine the fate of landfill methane in the absence of power generation.

16. **Step 5: Determine the baseline and baseline emissions:** The following paragraphs describe various approaches to be followed during different situations when determining the baseline for each measure, and the control parameters to be regulated while considering the approaches.

17. *Increase in consumption of output:* The level of output under the project determines the level of output under the baseline. However, in the situation where suppressed demand exists, the baseline level of service should be determined using the approved guidelines on suppressed demand. The baseline is to be determined for the total amount of output delivered by the project activity. In the case of brownfield projects,[3] if the output is increased above the level of maximum capacity of pre-project equipment, the total output of the project activity should be disaggregated into the output up to the level of maximum capacity of pre-project equipment and output exceeding this level. The output up to the level of maximum capacity can be further divided into two parts; the first is equal to the average output of historical years (e.g. one, three or five years), and the second is over and above historical average output but equal to the maximum capacity that the pre-project equipment can deliver. The baseline should be determined for each output separately. For project activities of distributed nature (e.g. distribution of compact fluorescent lamps to consumers) where it is expected that the behaviour of the consumers of the output delivered by the project activity will change due to perverse incentives caused by the certified emission reductions (CERs) of the project activity, an approach to monitor this change is followed by forming a control group of consumers who have similar characteristics as the project consumers but do not benefit from the CDM project.

➤*Control parameters:* The capacity of the pre-project equipment should be determined, taking into account an appropriate equipment load factor. An investment is necessary in order to ensure the increase in output consumption, beyond the maximum capacity of the pre-project equipment.

---

[2] For this example, as the technology and fuel are interlinked in an energy sector, two measures are combined into one (measure (ii) in the definition section).

[3] Brownfield projects are projects undertaken in a facility that has an operational history of at least one year prior to the implementation of the project activity.

DRAFT

18. *Multiple consumers:* If there are several consumers, the total output of the project activity should be disaggregated into outputs sent to each consumer and the baseline is determined for each consumer.

> ➤*Control parameters:* Consumers are divided into two categories: (i) specific consumers (existing or new) for which the baseline can be determined separately; and (ii) aggregated consumers (existing or new) for which the baseline cannot be determined separately.

19. *Technical lifetime of equipment:* As stated earlier, the baseline scenario takes into account the investment for all crediting periods (fixed crediting period of 10 years or renewable crediting period of 21 years). If the technical lifetime of the pre-project equipment that is replaced by new equipment ends during the crediting period(s), a new baseline scenario representing futuristic investment (at the end of the lifetime of the pre-project equipment) and corresponding baseline should be defined ex ante.

> ➤*Control parameters:* The technical lifetime of pre-project equipment(s) should be known. This approach does not apply where pre-project equipment would be retrofitted, and not replaced.

20. *Additionality of emission reductions achieved by the project activity:* The definition of additionality of the "project activity" as per CDM modalities and procedures should be clearly interpreted in terms of additionality of the "emission reductions achieved by the project activity". For example, one project producing one output can lead to emission reductions that are additional (e.g. sent to consumer A to displace its current service provider which is more carbon intensive) and emission reductions that are not additional (sent to consumer B which is a new consumer and would have received the service with the same or lower carbon intensity in the absence of the project). This interpretation of additionality will lead to the change in additionality of emission reductions due to the project activity as a new baseline scenario becomes relevant (as defined ex ante) due to the end of the lifetime of the baseline equipment.

> ➤*Control parameters:* The additionality of emission reductions can change only if there are multiple baseline scenarios defined ex ante during all the crediting periods due to the issue of the end of the lifetime of baseline equipment(s), and these baseline scenarios are different from each other.

21. ***Sub-step 5.1: Identify the baseline for an applicable investment scenario:*** Identify the following four investment scenarios based on options available to the project participants (PPs) to deliver the same output(s) as in the case of the project activity:

(a) *Investment scenario: PPs would invest in another technology/fuel /feedstock in the absence of the CDM.* This decision of PPs is governed by the fact that regardless of the CDM they are facing an imminent investment decision at present in order to supply the desired output. A third party does not have the ability to supply the output. The choice of technology/fuel/feedstock will change in the absence of the CDM. Examples of such projects include the replacement of a pre-project boiler with a more energy-efficient boiler, or a switch to a cleaner fuel. Such decisions are governed by financial attractiveness and therefore the most attractive course of action will be taken in the absence of the CDM. If the most attractive course of action is the continuation of current practice, and there is no expansion of capacity resulting from the installation of new equipment, the baseline for historical emissions should be based on the average output delivered by the pre-project equipment in historical years (e.g. one, three or five years). If an expansion of capacity results in increased output consumption, the historical output should be further divided into two categories. The first is equal to the average of historical years (e.g. one, thee or five years), and the second is over and above the historical average but lower than the maximum capacity that the pre-project equipment can deliver. The baseline should be determined for each output separately.

DRAFT

➤*Control parameters:* The list of project alternatives available to PPs should be realistic, credible and exhaustive. The project alternatives should deliver the same output that is delivered by the project activity. The project alternatives should first be processed through a barrier test in accordance with the tool for demonstration of additionality, and only the remaining alternatives should undergo investment comparison analysis.

(b) *Investment scenario: PPs would not invest in the absence of the CDM and nobody would invest to deliver the same output as the project activity.* This investment scenario applies to a specific category of projects taken up for GHG destruction. This investment decision is governed by the fact that the PPs gain no benefit by investing in the project, and therefore they will not invest without the CDM. No one other than the PPs have control over the source of emissions to be able to implement the GHG abatement project activity. An example of such a project is HFC23 destruction in an HCFC22 production plant, where the destruction of HFC23 is neither required by law in the host country, nor does it result in any benefit other than CER revenues. The baseline is determined by actual emissions, which is the combination of historical/actual emissions and the factor of continuous improvement in the sector, determined and applied at an appropriate interval.

➤*Control parameters:* It needs to be clearly ascertained that PPs have no direct or indirect benefits other than CERs earned by CDM projects, and also that the CDM project activity is not mandatory as per regulations.

(c) *Investment scenario: PPs would not invest but a third party would invest in the absence of the CDM.* This investment decision is governed by the fact that the output is delivered to an unspecified consumer or to an open market, and therefore it could be supplied by a third party. An example of such projects is a wind power project supplying renewable energy to the grid. Since it is uncertain what the output of the CDM project activity displaces, the baseline can be set at a conservative benchmark (e.g. emission factor) either using approved standardized baselines if applicable or benchmark (48 (c)). If the technology of the sector is changing rapidly (e.g. new technologies outweigh old ones every year due to substantial improvements in performance), the baseline should be adjusted using autonomous improvement of the sector.

➤*Control parameters:* The conservativeness of the benchmark and quality of data required to determine the benchmark should be ensured.

(d) *Investment scenario: PPs would invest without the CDM at a later time in the future.* This investment decision is governed by the fact that the PPs, regardless of the CDM, will be facing an imminent investment decision at a foreseeable point in the future. For example, the investment certainly takes place at the end of the technical lifetime of equipment that would have been used in the absence of the CDM project activity. A third party will not have the ability to supply the output, as this output is required specifically by the PPs. If an imminent investment decision to invest in future before the end of the entire crediting period is foreseen, the baselines for the entire crediting period are determined ex ante including the baseline for the investment scenario at the beginning of the crediting period and for the future investment scenario. An example of such a project is a boiler that is replaced under a CDM project activity having a crediting period of seven years which can be renewed two times; however, the technical lifetime of the pre-project boiler ends at the fifth year. The baseline for the project activity is the historical or actual emissions until the technical lifetime of the pre-project equipment ends. After the end of the technical lifetime of the pre-project equipment, the baseline is the minimum of the benchmark (using either an approved standardized baseline if applicable or 48(c)) and the most attractive course of action.

DRAFT

➤*Control parameters:* The ex ante determination of the baseline at the end of the lifetime is only possible where the exact technical lifetime of the pre-project equipment is known.

22. ***Sub-step 5.2: Determine the emissions for the identified baseline***: The following paragraphs explain what approaches should be followed for the determination of emissions for each identified baseline above.

23. *Emissions for the baseline of the most attractive course of action (if other than the continuation of current practice):* The baseline emissions should be calculated by formulating the reference plant (or equipment) based on manufacturer's specifications and conservative efficiency and/or emission factor should be used for the reference plant (or equipment). If the lifetime of the most attractive baseline plant/equipment is smaller than the crediting period, the autonomous improvement factor of the sector should be included at the end of the lifetime of the baseline plant/equipment.

➤*Control parameters:* The specifications of reference plant (or equipment) should be collected from most reputed suppliers and the most conservative efficiency or emission factor should be chosen to calculate baseline emissions. The lifetime of all the alternatives considered to determine the most attractive course of action should be the same. The lifetime of the most attractive technology should be known.

24. *Emissions for the baseline based on historical or actual data:* The following rationale should be applied to distinguish the various approaches based on historical and actual emissions.

(a) *Average of historical years or historical campaign:* Historical data should be used to calculate the baseline emissions where it is likely that in absence of the CDM, the current practice will continue without change in the conditions. For example, the data on average performance of a boiler is required for historical years if under the CDM project activity the boiler is retrofitted to improve efficiency, but in the absence of the CDM project the boiler would have continued its current operation. Where historical data are available the average efficiency (or emission factor) of the appropriate number of years that can represent historical data accurately should be used to calculate the baseline emissions. For example, in the case of a boiler, the efficiency value of the previous three years is normally available. Where the data for three years are not available they can be collected by running an actual campaign operated under optimal operating conditions and calculating the efficiency/emission factor based on actual measured values. For example, in the case of a nitric acid plant, the data on N_2O emissions from the N_2O waste stream, in the absence of a secondary/tertiary catalyst that is installed as a part of a CDM project activity, are not available. As per methodology AM0028 and AM0034, an average value of a few baseline campaigns is calculated to be the baseline N_2O emission factor. For some cases, such as landfill gas destruction, the baseline emissions are calculated using actual measurement of the gas emitted in the project year *y*. For all GHG destruction projects, baseline emissions should be calculated based on actual emissions using either of the above approaches in combination with the factor of continuous improvement in the sector, determined and applied at an appropriate interval.

(b) *Capacity expansion:* As stated earlier, if there is an increase in consumption of output the baseline is to be determined for the total amount of output delivered by the project activity. The total output of the project activity should be disaggregated into the output up to the level of maximum capacity of pre-project equipment and output exceeding this level. The output up to the level of maximum capacity can be further divided into two parts. The first is equal to the average output of historical years (e.g. one, three or five years), and the second is over and above the historical average output but equal to the maximum capacity that the pre-project equipment can deliver. The baseline emissions for

DRAFT

the output equal to the average of historical years should be equal to historical performance (e.g. emission factor, efficiency). However the baseline emissions for the output between historical average and maximum capacity of pre-project equipment should be calculated as the minimum of historical performance and the benchmark calculated using approved standardized baselines or 48(c).

(c) *Control group:* This approach applies to projects of a distributed nature where it is expected that the behaviour of the consumers of the output delivered by the project activity will change due to perverse incentives caused by CERs of the project activity. An approach to monitor this change is followed by forming a control group of consumers who have similar characteristics as the project consumers but do not benefit from the CDM project. The level of output for the consideration of baseline emissions should be the minimum of the output of the project activity and that of the control group. Alternatively, the level of output for the consideration of baseline emissions can be the minimum of default value of output from a recognized source (e.g. in the case of a water purifier, the consumption of drinking water per capita established by the World Health Organisation) and the output of the project activity.

(d) *Manufacturer's efficiency values*: For cases such as chillers, where the efficiency of equipment depends on several factors (e.g. seasonal factors, load etc.) and where the equipment performance is not recorded in historical years displaying the impact of each factor, it is possible to use historical efficiency based on the equipment manufacturer's data (e.g. curve) depicting efficiency values based on several combinations of input parameters. The manufacturer's efficiency values can be used even if the required historical data is available, bearing in mind that it is more conservative compared to actual performance.

(e) *Allocation of baseline emissions:* In cases where multiple units of equipment are replaced by fewer units of equipment and the baseline is based on historical performance, the allocation of baseline emissions among the pre-project equipment should be done in order to achieve conservativeness. For example, the output of project equipment can be divided among the pre-project equipment using the priority order based on the descending order of their performance.

(f) *Use of actual data to determine baseline emissions:* Actual data should be used to calculate the baseline emissions where it is likely that in the absence of the CDM, the current practice will continue but the baseline emission factor/efficiency is subject to change due to: (i) change in various conditions such as operating conditions and raw material condition and quality to such a level that the baseline and project conditions become incomparable; (ii) rapid pace of autonomous improvement in the sector, with a likely impact on the pre-project technology. Case (i) is possible where the pre-project plant/equipment is retrofitted, and for such a case the baseline emission factor should be calculated based on retrievable campaigns, by setting the plant/equipment on the pre-project mode and running the baseline campaign under new conditions (operating conditions, raw material). An example of such a case is an arc furnace retrofitted for improved energy efficiency. This furnace receives a completely new blend of raw materials in terms of mix of scrap, iron ore and sponge iron, which causes a change in temperature, heat timings and other operating parameters, for which no historical experience exists. To calculate an accurate baseline emission factor, the furnace should be operated without the retrofit (as in the pre-project scenario) under new conditions and new data on production and energy consumption should be collected. For calculating the baseline emission factor for case (ii) it is necessary to adjust the baseline emission factor,

DRAFT

which is calculated based on historical data, for the autonomous improvement in the sector.

➤*Control parameters:* Based on the above, in order to calculate the emission factor based on historical or actual data, the following control parameters should be used: (i) whether or not the project affects the baseline conditions; (ii) the pace of autonomous improvement in the baseline emission factor; (iii) the possibility of keeping operating conditions comparable to those during the campaign (e.g. heat exchangers and catalysts with decreasing performance), or the possibility of conducting a baseline campaign under optimal conditions; (iv) the possibility of retrieving the baseline condition after implementation of project; (v) whether the CDM project activity is of a distributed nature which requires a control group.

25. *Emissions for the baseline based on a benchmark using approved standardized baselines if applicable or using (48(c)):* The conservativeness of a benchmark determined using 48(c) should be based on the top 20 per cent performing technologies in the same category to which the CDM project belongs. The benchmark is either based on the average performance of the top 20 per cent least carbon-intensive technologies built in the five years prior to the implementation of the CDM project activity, or based on the average performance of the least carbon-intensive technologies contributing to the production of 20 per cent of output in the sector. For the sectors where technology changes take place at a fast pace, the factor of autonomous improvements in the sector should be brought in to adjust the baseline emission factor at an appropriate regular interval, subject to a minimum interval of one year. This factor can be determined based on the following: (i) the historical trend of autonomous improvement in the sector in a specific country and applied in the methodology ex ante; (ii) the autonomous improvement determined in project year *y* and applied ex post; (iii) a fixed value recommended in the methodology or any combinations..

➤*Control parameters:* An appropriate level of aggregation should be selected for the benchmark. While using 48 (c) the performance of CDM registered plants should not be included for the calculation of the benchmark.

DRAFT

Appendix I: Matrix to determine baseline of a measure

Cases	Investment scenario and corresponding baseline			
Investment scenario	Would invest in another technology/fuel /feedstock in the absence of the CDM *(PPs will invest regardless of the CDM in existing or new facilities/equipment)*	Would not invest and nobody would invest in the absence of the CDM *(No revenues other than CDM, applicable to GHG destruction project activities)*	Would not invest but a third Party would invest in the absence of the CDM *(For greenfield facilities and expansion project activities)*	Would invest later in the future in the absence of the CDM *(Investment in existing facilities/equipment)*
Baseline[4]	Most attractive course of action (technology/fuel /feedstock)/	Actual emissions	Benchmark using 48(c) or standardized baseline	Historical/actual + minimum of the benchmark technology and most attractive
Baseline emissions[5]	1) If the most attractive course of action is other than the continuation of current practice, the baseline emissions should be based on the design performance provided by the manufacturer for reference facility/equipment. If the lifetime of the most attractive baseline plant/equipment is shorter than the crediting period, the autonomous improvement factor of the sector should be included at the end of the lifetime of the baseline plant/equipment. 2) If the most attractive course of action is the continuation of current practice, then either of the following applies: (a) Historical emissions based on the following applicable options. - Average of previous years (e.g. one, three or five years) before implementation of the	Either of the following options applies for the .[6] The baseline emissions should be determined using the following options and are subject to autonomous improvement of the sector at an appropriate frequency. - Historical emissions based on the average of previous years (e.g. one, three or five years) before implementation of the project; or - Historical emissions based on a campaign before starting the project; or - Actual emissions based on a campaign during crediting period; or - EF based on measurement during the project.	Benchmark based on the top 20 per cent performing facilities/ equipment or the manufacturer's specifications of reference plant/ equipment determined using standardized baseline.	Combination of historical/actual emissions and minimum of emissions of benchmark technology and most attractive technology.

[4] Refer to sub-step 5.1 for each type of baseline under different investment scenarios.
[5] Refer to sub-step 5.2 for baseline emissions and safeguards to be followed to ensure conservativeness under different circumstances.
[6] Conditions for application are stipulated in relevant paragraphs of sub-step 5.2.

DRAFT

	project; or - Based on a campaign before starting the project; (b) Actual emissions based on following applicable options: - Campaign during crediting period; or - Retrievable baseline; or - Measurement during the project.			

DRAFT

Appendix II: Examples of inconsistencies in current methodologies

1. Several commonly used large-scale CDM methodologies and consolidated methodologies were evaluated and compared for their determination of the baseline and baseline emissions. The differences in approaches have been justified in several cases, however there is no sufficient rationale provided within the methodologies for the adopted approach. The following was observed:

(a) ***Power sector methodologies***

Methodology	Baseline approach
ACM0002	48(a) and/or 48(b)
ACM0012	48(a) and/or 48(b)
AM0029	48(a) and/or 48(b)
ACM0013	48(a) and 48 (c)

Salient observations:

(i) ACM0002, ACM0012 and AM0029 allow greenfield plants to claim emission reductions due to the supply of low/zero carbon electricity to the grid. ACM0002 and ACM0012 calculate the baseline based on a benchmark, i.e. the combined margin emission factor of the grid, whereas AM0029 requires the baseline emission factor to be calculated based on the minimum between the combined margin emission factor, the built margin emission factor and the most attractive course of action. There is no approach provided on how one can define the emission factor of the most attractive alternative plant.

(ii) ACM0013 allows for highly efficient greenfield power plants supplying power to the grid to claim emission reductions as compared to a low efficiency baseline plant. The efficiency of the baseline plant is required to be determined based on the minimum between the emission factor of the most attractive alternative plant using the same fuel and the top 15 per cent performing plants in the host country, using the same fuel. There is no approach provided on how one can define the emission factor of the most attractive alternative plant.

(b) ***Transport sector methodologies***

Methodology	Baseline approach
ACM0016	48(a)
AM0031	48(a)
AM0090	48(a) and/or 48(b)

Salient observations:

(i) Although both AM0031 and AM0090 allow the use of default emission factor values, only AM0090 allows the application of the default emission factor to greenfield services; AM0031 is limited to existing services.

(ii) AM0090 allows using default values for both existing and greenfield services.

(iii) ACM0016 uses a dynamic baseline to consider technological improvement, which the other methodologies do not.

DRAFT

(c) ***Metal production sector methodologies***

Methodology	Baseline approach
AM0030	48(a)
AM0059	48(b)

Salient observations:

(i) Both methodologies apply to cases where production has increased beyond its historical level. Although in AM0030 the emission factor is uniform regardless of such production expansion, in AM0059 a 20 per cent benchmark is used to establish the emission factor of production exceeding the historical level.

(ii) AM0030 has a “cap” for the specific emission factor, which is an international benchmark value. AM0059 has no such concept, and the baseline emissions up to the historical production are not limited by an industry performance indicator.

(d) ***Waste handling and disposal sector methodologies dealing with GHG destruction***

Methodology	Baseline approach
ACM0001	48(a) and/or 48(b)
ACM0010	48(b)
ACM0014	48(a) and/or 48(b)

Salient observations:

(i) ACM0010 allows using published average values as the emission factor, whereas the other methodologies do not have this option, and the emission factor is determined through measurement.

(e) ***Waste handling and disposal sector methodologies dealing with GHG formation avoidance***

Methodology	Baseline approach
AM0025	48(a) and/or 48(b)
AM0039	48(a)

Salient observations:

(i) Although both methodologies apply to existing services, AM0025 bases its baseline emissions only on the measured parameter, regardless of the historical situation. AM0039 uses the historical values for the baseline emissions determination.

2. Other issues identified:

(a) AM0023 uses a static estimation of the baseline, though the quick pace at which the relevant technology changes merits using a dynamic approach;

(b) AM0028 and AM0034 use a static estimation of the baseline, though the quick pace at which the relevant technology changes merits using a dynamic approach. This issue is currently under consideration by the Board;

DRAFT

(c) In all methodologies, there is a lack of guidance on how to evaluate the baseline after the end of the lifetime of the baseline equipment involved. The crediting is stopped at the end of the lifetime, if the end of lifetime is reached before the end of the crediting period.

- - - - -