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Standardized baselines under the clean development mechanism

Technical paper

Summary

This document was prepared in order to support the consideration of standardized baselines under the clean development mechanism (CDM), in response to the conclusion of the Subsidiary Body for Scientific and Technological Advice given in document FCCC/SBSTA/2010/6, paragraph 95. This document takes into account the views of Parties reported in document FCCC/SBSTA/2010/MISC.3/Rev.1 and document FCCC/SBSTA/2010/MISC.13 and Add.1 and the views of intergovernmental organizations and admitted observer organizations posted on the UNFCCC website, as well as relevant technical literature on standardized approaches under the CDM.

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I. Mandate

1. At its sixth session, the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) requested (decision 2/CMP.5, para. 25) the Subsidiary Body for Scientific and Technological Advice (SBSTA) to recommend modalities and procedures for the development of standardized baselines under the clean development mechanism that are broadly applicable, that provide a high level of environmental integrity and that take into account specific national circumstances. It further requested that the SBSTA forward a draft decision on this matter to the CMP at its sixth session. Furthermore, the CMP invited Parties, intergovernmental organizations and admitted observer organizations to make submissions to the secretariat on their views on this matter.

2. The SBSTA, at its thirty-second session (FCCC/SBSTA/2010/6, para. 95), invited Parties, intergovernmental organizations and admitted observer organizations to make submissions to the secretariat on options to address all relevant issues, including the following, while ensuring a balance between practical usability, environmental integrity and attractiveness:

(a) The scope of the development of standardized baselines;

(b) The mandatory or optional nature of the use of standardized baselines;

(c) The procedural requirements for the development of standardized baselines, including the involvement of designated national authorities (DNAs);

(d) The priorities for developing standardized baselines;

(e) Access by underrepresented regions, sub-regions, sectors and least developed countries (LDCs) to the clean development mechanism (CDM);

(f) The level of aggregation and the boundaries;

(g) Data quality, availability, collection and confidentiality;

(h) The financing of the development of standardized baselines, including capacity-building and data collection;

(i) Accounting for developments over time, including past efforts.

3. The SBSTA, at its thirty-second session (FCCC/SBSTA/2010/6, para. 95), requested the secretariat to prepare a technical paper that takes into account all submissions received from Parties and relevant organizations, as referred to in paragraphs 1 and 2 above, for consideration by the SBSTA at its thirty-third session.

4. All submissions from Parties, intergovernmental organizations and admitted observer organizations on views related to this agenda item are available on the UNFCCC website.[1]

II. Technical report

5. Standardized baselines have been proposed for several different reasons, including the following:

(a) Improving efficiency by reducing transaction costs, complexity and uncertainty for project participants;

[1] <http://unfccc.int/parties_observers/ngo/submissions/items/3689.php>.

(b) Enhancing transparency and objectivity;

(c) Facilitating access to the CDM, particularly if the development of standardized methodologies for determining baselines and additionality are prioritized for underrepresented countries and regions, thereby reducing the burden on project developers and improving the regional distribution of CDM projects;

(d) Contributing to the streamlining of CDM procedures;

(e) Promoting the scaling-up of mitigation actions while ensuring environmental integrity.

6. This technical paper assesses the different issues specified by the SBSTA.

A. Scope of the development of standardized baselines

7. Standardized baseline approaches may encompass the following aspects of project development:

(a) Baseline scenario identification;

(b) Baseline emissions calculations;

(c) Additionality demonstration;

(d) Project emissions calculations.

8. Standardization can be achieved through different tools and options:

(a) Emissions intensity benchmarks and standards, which are emission rates per unit of output and are based on the current and/or future performance of a peer group of similar plants or installations;

(b) Default values, including emissions factors and emission reduction values, which are inputs to the calculation of baseline, project or leakage emissions and could include, for example, grid emission factors, Intergovernmental Panel on Climate Change (IPCC) default values for fuel characteristics and other values that are common across projects. They can also include conservative estimates of the emission reductions per unit for a given project (e.g. a solar lamp or a compact fluorescent lamp), which can be multiplied by the number of units installed to calculate the total emission reductions of a project without monitoring the emission reductions of each unit;

(c) Positive lists, which are lists of project types that are considered automatically additional under certain conditions (e.g. location, technology or size). For example, these positive lists may be applied to project types that face high barriers to investment and/or project types that have no or few financial benefits other than the revenues from certified emission reductions (CERs);

(d) Standardized barrier tests: Projects could be considered additional if the technology has not reached a certain market penetration in a particular country or region. A standardized questionnaire regarding technology, legislation and project circumstances could be used to assess the additionality and/or baseline scenario of a project.

9. In a number of cases, the above approaches are already used in approved baseline and monitoring methodologies. For example:

(a) Emissions intensity benchmarks/standards: Methodology AM0070, "Manufacturing of energy efficient domestic refrigerators",[2] determines emission

[2] <http://cdm.unfccc.int/UserManagement/FileStorage/V35MBIS0GWTRK1LEQP94D7YO8UH26C>.

reductions from manufacturing and from using highly efficient refrigerators. A performance benchmark, defined as the specific electricity consumption per storage volume, is used both for demonstrating additionality and for determining baseline emissions;

(b) Default values, including emissions factors and emission reduction values: The "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"[3] allows project participants different options to determine the carbon dioxide emission factors and net calorific values of fuels, including measurements or the use of IPCC default values applied in a conservative manner;

(c) Positive lists: The "Guidelines for demonstrating additionality of renewable energy projects =<5 MW and energy efficiency projects with energy savings <=20 GWH per year"[4] consider renewable energy projects smaller than or equal to 5 MW and energy efficiency projects with energy savings of less than or equal to 20 GWh per year to be automatically additional under certain conditions.

10. The appropriateness, scope and detailed implementation of these approaches may vary significantly across project types, sectors, technologies and countries. Standardized baselines may not be a suitable replacement for existing approaches for all project types, but rather a tool that may be applied where it is most likely to provide robust results in terms of increased efficiency without a compromise of environmental integrity.

11. In developing standardized approaches for baseline emission calculation and additionality determination, the stringency or conservativeness of these approaches is an important issue. The level of stringency will have direct repercussions on the environmental integrity of the CDM.

12. This stringency may be particularly important for demonstrating additionality. Given that standardized approaches do not, or only partially, consider project-specific parameters and circumstances, their use will result in both 'false positives' (i.e. projects that pass the standardized additionality test but that would also have been implemented in the absence of the CDM) and 'false negatives' (i.e. projects that do not pass the standardized additionality test and will not be implemented without the incentives given by the CDM). The stringency of the standardized approach to demonstrate additionality will have a direct impact on the number of 'false positives' and the number of 'false negatives': more stringent approaches will tend to reduce the number of 'false positives' and will increase the number of 'false negatives'.

13. Similarly, a standardized approach for baseline emission calculation does not consider, or only partially considers, project-specific parameters and circumstances. In consequence, some projects may receive more and others less emission reductions compared with a situation in which the baseline is established on a project-specific basis.

14. The overall impact on environmental integrity depends on the stringency applied for both additionality demonstration and baseline emission calculation. For example, if the standardized baseline would be set below the business as usual emissions level, this will reduce the amount of CERs that the eligible projects receive and may (partially) compensate for the impact of projects that are 'false positives'. On the other hand, a more stringent standardized baseline will reduce the incentive given by the CDM for the projects.

15. For emission intensity benchmarks or standards, either the same benchmark or two different benchmarks could be used for the baseline emission calculation and the additionality demonstration.

[3] <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf>.
[4] <http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid22_v01.pdf>.

16. Two different stringency levels for additionality and baseline emissions can be supported by the argument that the baseline emission calculation and the additionality determination are two different analytical procedures, and hence it could be necessary to use different stringency levels for each procedure.

B. Mandatory or optional nature of the use of standardized baselines

17. Under the current procedures of the CDM, project participants can only choose between methodologies if there are two or more approved methodologies that are applicable to the project. In practice, many CDM projects can only use one approved CDM methodology. In such cases, a revision of the existing methodology to include a standardized baseline would make the use of the standardized baseline approach mandatory. If the use of a standardized baseline were to be optional, the CDM Executive Board (hereinafter referred to as the Board) may not introduce them in existing methodologies but may approve new methodologies with standardized baselines, which can then be used in parallel to existing methodologies. In this case, the project participants could either use the existing methodology or the new methodology with the standardized baselines. Similarly, standardized baselines could also be introduced as an option in existing methodologies. Many approved methodologies and tools already allow the project participants to choose between either using simple conservative default values or measuring emissions more accurately, which potentially involves higher transaction costs.

18. Whether there are trade-offs between the mandatory and voluntary use of standardized baselines depends on both the stringency of the standardized baseline and the applicability conditions of the baseline methodologies currently available for that sector or technology. If the existing approved methodologies are relatively narrow in their applicability (e.g. large-scale industrial energy efficiency or building energy efficiency methodologies), even a fairly stringent standardized baseline methodology that has a broader coverage in the sector could increase the flow of projects in that sector because it reduces transaction costs and opens new scope for projects. However, if the existing methodologies have broad coverage (e.g. renewable power for the grid), allowing the project participants to choose between a standardized baseline methodology and an existing project-specific methodology could result in a situation in which the project participants would only choose the standardized baseline if they receive more CERs than under a project-specific approach (assuming the transaction costs for the latter are modest). The question of whether the use of standardized baselines should be voluntary or mandatory may therefore be related to the stringency level of the baseline and the additionality test, if this is set at a different level or using a different mechanism.

19. Depending on the extent to which the baseline was standardized, project participants might still need to supply some project-specific data, even when using a standardized baseline methodology. In addition, there could be a transition period during which standardized baselines are introduced and existing methodologies are phased out.

20. For the current procedures under the CDM, a revision of a methodology is only applicable to new project activities or to existing project activities at their renewal of the crediting period. If standardized baselines are introduced under the current procedures, they would not impact on registered projects until the renewal of the crediting period.

C. Procedural requirements for the development of standardized baselines, including the involvement of designated national authorities

1. Responsibility for developing and approving standardized baselines

21. The Board, and ultimately the CMP, may provide guidance to and oversight of the development and approval of standardized baselines. Methodologies including standardized baselines could be proposed by project participants or other entities to the Board (bottom-up process) or could be developed by the Board (top-down process), or both approaches could be combined.

22. Under a top-down process, the Board and its supporting bodies may initiate the development of methodologies in sectors and geographical areas considered as priorities. The CMP, at its fifth session, authorized the Board to prioritize, informed by an analysis of the potential use of methodologies and the potential for emission reductions, the consideration and development of baseline and monitoring methodologies that are applicable to underrepresented project activity types or regions, in order to improve the efficiency of operation of the methodologies processes. The Board subsequently decided to prioritize the following sectors: energy for households; transport; energy efficiency in construction; and agriculture. In further prioritizing areas, several aspects may be taken into account, including, inter alia, areas in which the costs of methodology development would be difficult for project participants and host countries to bear and areas in which standardized baselines would reduce the transaction costs of project development considerably. The Board and its support structure may also coordinate data collection efforts.

23. The development of standardized baselines may require substantial investments in data collection. Challenges exist with the availability, accuracy and confidentiality of the data. In addition, the data has to be managed and analysed in order to establish standardized baselines. The Board may therefore need to cooperate with other institutions and dedicate additional resources and staff. Standardized baselines could be developed under the supervision of an existing panel (e.g. the CDM Methodologies Panel) or a new panel or working group established specifically for standardized baselines. While some of this work could be conducted by the support structure of the Board, the involvement of experts from the relevant sectors might also be considered. This could, for example, take the form of consultations or workshops with relevant institutions, stakeholders and technical experts, or by drawing on a roster of experts. Another question is how to ensure that the data used are sufficiently accurate and reliable and that the approved standardized baseline methodology is followed. This may be ensured by independent reviews of the data and calculations by designated operational entities (DOEs), experts, working groups or panels of the Board or other institutions.

24. Under a bottom-up process, entities currently involved with CDM methodology development (e.g. project developers, DNAs, regional development banks and other multilateral organizations) may be allowed to develop and propose to the Board a standardized baseline methodology, particularly if the existing approved methodologies did not cover their projects.

25. A combination of top-down and bottom-up processes could also be followed. In this case, the Board may work on developing standardized baselines in some areas, while at the same time assessing submissions on standardized baselines from third party entities.

2. Role of designated national authorities and host country institutions

26. DNAs may have several important roles in standardized baseline development. They may be directly involved in the development of standardized baselines and they could also

assist with data collection, testing of new methodologies on example projects in their countries and/or providing information on country-specific parameters and data sources.

27. The involvement of DNAs could also facilitate building further the capacity of DNAs on carbon market opportunities, data collection and skills for other emissions monitoring purposes, and in ensuring that the standardized baselines are appropriate for the specific circumstances of the host country. These activities by DNAs may need to be supported financially, given that the cost of data collection and developing standardized baselines can be significant.

28. The current CDM rules and procedures do not specifically foresee a role for DNAs in the methodology approval process. Publishing grid emissions factors for use with the "Tool to calculate the emission factor for an electricity system"[5] is often undertaken by DNAs, but they are not required to do so. Where standardized baselines use the same value globally or in a group of countries, it may be more difficult to involve a large number of DNAs in the process. Where a standardized baseline includes a country-specific value, however, involvement of the DNA in establishing the value could be easier.

29. In addition to DNAs, other host country institutions with expertise in particular sectors or technologies may be involved in the development of standardized baselines, as these institutions may have detailed technical knowledge and access to data for the concerned sectors or technologies.

3. Process of development and timing

30. In implementing standardized baselines under the CDM, the CMP may provide guidance to the Board on different aspects. An important question is whether standardized baselines should be assessed under the current modalities and procedures for methodology approval or whether new procedures should be established. Given that standardized approaches are already used in some approved methodologies and tools (see chapter 2.A), the CMP may consider continuing to allow project participants to submit such approaches under the current modalities and procedures. Moreover, standardized approaches are also contained in tools and guidance approved by the Board. In this regard, the CMP may consider whether or not alternative bottom-up and/or top-down tracks for the submission of standardized baselines should be enabled. Opening such tracks would require establishing relevant institutional arrangements, which may be decided on by the CMP or the Board.

31. Based on guidance from the CMP, and the recommendations of the SBSTA, the CMP or the Board may initiate a process to:

(a) Prioritize project types or sectors for standardized baseline development;

(b) Decide on the regulatory set-up for data quality management and collection;

(c) Agree on the institutional arrangements for a top-down methodology development process (i.e. what work is done by which institution);

(d) Agree on general guidelines for what constitutes an acceptable standardized baselines proposal (i.e. to use as the basis of evaluating bottom-up submissions);

(e) Review existing methodology experience for relevant lessons for standardized baselines.

32. The Board may then proceed to prepare standardized baselines for the prioritized sectors, on the basis of relevant guidance from the CMP. The idea of a "pilot programme" could also be followed, in which one or two high-priority areas where there is already

[5] <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf>.

significant experience with standardized baseline approaches are used and the applicability and ease of use in several countries, ideally LDCs, are tested.

4. Transparency in process/stakeholder engagement

33. It is important that the process of developing standardized baselines is transparent and allows stakeholders to provide input. Input may be provided before and/or after a draft standardized baseline is developed, similar to the current provisions, under which stakeholders can comment on new proposed methodologies and the Board regularly seeks public comments on new tools. Transparency and stakeholder involvement may be particularly important for standardized baselines because the environmental integrity, effectiveness and usability of standardized baselines depends critically on the choice of a small number of parameters.

D. Priorities for developing standardized baselines

34. There are widely varying priorities proposed for the use of standardized baselines, with most, but not all, relating to the prioritization of certain geographical areas and project types. The key priorities proposed so far are:

(a) Country-specific priorities:

(i) Countries hitherto underrepresented in the CDM;

(ii) Countries and regions with a lack of data for project-specific baselines.

(b) Sector-/project-type specific priorities:

(i) Sectors with a high emission reduction potential but with highly dispersed emissions sources and combinations of multiple emission reduction technologies, some of which without project-specific baselines and without much progress made by the CDM;

(ii) Internationally homogenous, highly concentrated heavy industries;

(iii) Sectors or project types for which project developers faced difficulties in the application of project-specific baselines;

(iv) Sectors or project types for which transaction costs can be reduced most compared with project-specific baselines;

(v) Sectors or project types that could have substantial impacts on development in LDCs, Small Island Developing States (SIDS) or countries previously underrepresented in the CDM;

(vi) Underrepresented project types, particularly those with sustainable development benefits;

(vii) Processes with single outputs and single inputs;

(viii) Sectors or project types with good data availability;

(ix) Project types that can be substantially scaled up;

(x) Sectors or project types that DNAs consider important.

35. Although the priorities above are diverse, only a few of them (e.g. sectors with dispersed emissions sources and homogeneous heavy industry, and lack of data and good data availability) are mutually exclusive. Hence standardized baselines that satisfy most of the criteria may be prioritized. It should also be noted that certain types of standardization

(e.g. performance indicators compared with default parameters) are better suited for certain applications than others.

36. The table shows for a number of example sectors which criteria are met by the sector. The evaluation is preliminary and requires further research in order for it to be relevant to policymaking.

Prioritization of sectors

Sector	*Homogeneity*	*Data availability*	*Reduction of transaction cost*	*Applicability to underrepresented countries*	*Reduction potential*
Aluminium	✓	✓✓	✓		✓
Desalination	✓		✓		✓
Cement	✓		✓	✓	✓✓
Transport			✓✓	✓✓	✓✓
Buildings			✓✓	✓	✓✓
Steel		✓	✓		✓
Household appliances			✓✓	✓✓	✓✓
Float glass	✓✓		✓		

✓ = Criterion is met, ✓✓ = Criterion is strongly met

E. Access by underrepresented regions, sub-regions, sectors and least developed countries to the clean development mechanism

37. An important objective of the use of standardized baselines could be to increase access by underrepresented regions, sub-regions, sectors and LDCs to the CDM. To achieve this objective it may be helpful to focus the top-down standardized baseline methodology development process on these underrepresented areas. Since the cost of developing locally appropriate methodologies has been a key barrier in many of the underrepresented areas, having dedicated funding and technical resources for developing standardized baselines in these areas may be a step forward towards a more equitable distribution of CDM projects.

38. Additional actions to promote increased access could be envisaged in a pilot phase for standardized baselines. These actions or policies could include the following:

(a) Fast track decision-making for the evaluation of standardized baseline methodology proposals from DNAs;

(b) Involvement of DNAs and other host country institutions and experts in the process of developing top-down standardized baseline methodologies;

(c) Dedicated resources for data collection and analysis in underrepresented areas, to feed into methodology development;

(d) Streamline additionality testing within standardized baselines that are applied to underrepresented areas, similar to the current rules for additionality for very small scale

projects in LDCs or SIDS.[6] If automatic additionality testing of the restricted scope of particular technologies were included, this could also be limited to a predetermined time frame for the pilot phase.

F. Level of aggregation and boundaries

39. Selecting an appropriate level of aggregation is crucial to ensuring that the standardized baseline is representative of the applicable projects. Aggregation can be performed for the following dimensions:

(a) Space: geographical parameters account for a substantial portion of the differences in greenhouse gas (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. For example:

(i) Fuel cost differences can vary strongly between regions. However, they may only be used for disaggregation if no other supply can be sourced from outside the region;

(ii) Availability of inputs is often a crucial parameter of the GHG intensity of production and may be used as a basis for disaggregation;

(iii) The extension of the electricity grid;

(iv) Environmental conditions such as altitude, temperature, humidity and precipitation;

(b) Time: one of the most important grounds for disaggregation is the differentiation between new and existing installations. In some cases, existing installations may be further disaggregated into vintage classes. Such vintage classes may be defined based on the degree of growth and autonomous technological change in the sector, with a stronger disaggregation being applied in cases of a higher speed of change;

(c) Process: standardized baselines may be developed for single technologies or activities, partial production processes or entire production chains. A narrow system boundary may not be suitable for highly integrated processes with complex flows and interaction between multiple subcomponents. Similarly, a low level of aggregation leading to technology-specific performance standards may not be adequate for projects implementing new installations that may be able to invest in different types of technologies with strongly varying emissions. However, technology differentiation can be useful in the event that the use of one or more technologies is not fulfilling the legal requirements, that the technologies are not available or that the technologies are not realistic for economic or other reasons. Performance benchmarks related to a specific technology could also be used for the additionality demonstration if it is known that a certain technology will not be implemented under the business-as-usual scenario owing to financial barriers or prevailing practices. However, it appears difficult to establish a generic rule that can be applied to the selection of the system boundaries of the process involved;

(d) Product: a performance standard can compare one or more well-defined outputs. Key parameters influencing the aggregation level are:

(i) Homogeneity of the product;

[6] <https://cdm.unfccc.int/UserManagement/FileStorage/VK80BI3SAU4ROHX7MTN1LQ2DPJ5GZE>.

(ii) Comparability of inputs. Disaggregation according to inputs may only be appropriate if the project developer does not have access to the specific input, due either to the non-availability of the resource or to applicable regulations;

(e) Size/scale: size may be taken into account for aggregation if the performance characteristics of the product depend on its size;

(f) Load regime: in some cases, the quality of the product or service provided under the CDM project activity is directly linked to the load regime. This applies, for example, to the production of electricity, demand for cooling and heating of buildings (e.g. due to weather conditions) and other activities that are tied to local patterns beyond the control of the project developer. In these cases, standardized baselines may be disaggregated by different load regimes. For example, performance benchmarks for power plants may be differentiated according to base, intermediary and peak load.

40. There are some trade-offs between using a high level and a low level of aggregation of standardized baselines. A high level of aggregation usually allows the crediting of a broad range of, and combinations of, measures. For example, a benchmark for clinker production would allow crediting all different combinations of improvement measures at a clinker plant, including waste heat recovery, fuel switching, the use of alternative raw materials, etc. On the other hand, a single benchmark may not work for project types that focus on improving a particular technology or aspect of the plant. For example, a single grid emission factor for all types of power projects could potentially exclude projects that implement efficiency improvements in coal power plants.

G. Data quality, availability, collection and confidentiality

1. Data requirements

41. Owing to very different sector and country characteristics, there is no single way to approach data collection throughout the whole economy. Data may be collected and reported in a standardized manner and a reporting protocol may be developed for each approved standardized approach. Reporting protocols could be tested on the ground in order to: (1) ensure the feasibility of gathering adequate information; (2) ensure the feasibility of data collection with regard to practices in the host country; and (3) assess further data needs.

2. Data availability, collection and confidentiality

42. Data availability is comparatively good for the following sectors:

(a) The refinery and chemical industry sector, where Solomon Associates and SRI Consulting, both of which are private companies, collect and sell data. Coverage of refineries reaches over 80%;

(b) The cement, aluminium and steel sector, with the Cement Sustainability Initiative, the International Aluminium Institute and the World Steel Association collecting data. Coverage of production in some countries is still low but is increasing.

43. Data collection could be carried out in different ways, such as:

(a) Bottom-up collection of data from companies or households, which involves direct on-site measurement or the collection of indirect data (e.g. fuel invoices). Bottom-up collection of data could be expensive, especially for complex systems that require many inputs to be assessed. In addition, bottom-up data collection could be subject to concerns about confidentiality;

(b) Sampling, which involves collecting data from a statistically representative number of installations;

(c) Use of aggregated statistical data, which involves the use of aggregated data available in national or international statistics, such as production statistics.

44. Highly concentrated sectors are more amenable to data collection, but may be less relevant to countries that have been underrepresented in the CDM.

45. The time requirements for data collection should not be underestimated, since such collection could potentially require several years if no data exist at present.

46. Confidentiality of data is a very sensitive issue for companies in the highly competitive industrial sectors, especially if economic parameters are included. Data ownership and management of confidentiality may be an important issue to be addressed. Disclosure of possible conflicts of interest could be made mandatory for all entities and people with access to such data, and procedures should ensure maximum protection against theft of data.

3. Data quality and verification

47. Different institutions may be involved in efforts to ensure data quality, including the following:

(a) The entities involved in collecting the data;

(b) National governmental institutions, such as DNAs;

(c) Industry associations;

(d) A panel or other regulatory entity supervised by the Board;

(e) DOEs.

48. Procedures for data collection and verification may need to address the capacities of the host countries and potential incentives to inflate baselines in order to increase the number of CERs from projects.

49. The Board could oversee a set of the entities actually involved in determining standardized baselines for specific sectors or specific countries and in verifying the data used. This second tier of standardized approach developers could work closely with national institutions and relevant industries.

H. Financing of the development of standardized baselines, including capacity-building and data collection

50. The development of standardized baselines requires substantial upfront investment, since the savings in transaction costs will accrue over time and will depend on the degree of utilization of the standardized baseline.

51. Data collection is the most time- and resource-consuming step. A preliminary cost estimate of the development of a standardized approach covering 200 plants would be USD 2.6 million, assuming one-year monitoring of the data collection. If the data already exist, the cost would be USD 0.3–0.7 million.[7]

[7] See Hayashi, D., Müller, N., Feige, S., Michaelowa, A. 2010. *Towards a More Standardized Approach to Baselines and Additionality under the CDM. Determining Nationally Appropriate Performance Standards and Default Factors*. Commissioned by the UK Department for International Development. Zurich: Perspectives. page 10. Available at

52. To increase the participation of hitherto underrepresented countries, substantial international upfront financing would be required. Options to fund data collection could include the use of the budget surplus of the Board or multilateral fast-track finance. Annex I countries and non-Annex I countries with experience in the CDM could provide technical and financial support to national institutions in capacity building, particularly gathering and verifying data.

53. Moreover, the institutions in charge of the development of standardized baselines and the coordination of data collection may require capacity-building for data collection and quality control.

I. Accounting for developments over time, including past efforts

54. As the performance of a sector changes over time due to technical progress, the standardized baseline may need to be updated. In most cases, updates have the effect of increasing the stringency of the baseline over time, as the performance of peers usually improves over time. This would have the effect of reducing the amount of CERs for plants not keeping pace with improvements implemented by similar entities, especially non-technical measures, such as operational improvements. In some sectors, operational improvements for existing installations are widely available and widely implemented, hence a more frequent update of the standardized baseline may be considered.

55. For new installations, most of the measures are expected to involve implementation of low-carbon technologies rather than soft measures (e.g. operational improvements without investment in concrete technologies or measures). In most cases, new installations remain in operation until the end of the crediting period, and hence it can be argued that the baseline level may be either fixed for the crediting period applicable to the project or be updated by only accounting for parameters that can be improved without major technical upgrades (e.g. fuels or alternative feedstocks).

56. In order to capture the autonomous improvement of plants over time in the baseline scenario, an improvement ratio can be calculated and applied in the determination of the standardized baseline. This can be done either on the basis of historical data or using actual plant performance data. The use of an autonomous improvement ratio extrapolated from historical data instead of the annual collection of data has the advantage that it reduces the burden of data collection. However, the use of such a ratio over several years may lead to an inaccurate standardized baseline, especially if a break in the improvement pattern is taking place (e.g. a sudden increase or decrease in energy intensity). One option to address this could be the introduction of indicators for occurrence of a break, such as a deviation from the trend by *x* per cent. Similarly, a degradation factor can be calculated in order to simulate the decrease in performance that would have taken place without measures such as maintenance and good housekeeping.

<http://www.perspectives.cc/home/groups/7/Publications/CDM_standardized_approach_Full_report.pdf>.