GUIDANCE NOTE

Standardized Baselines

December 2013

United Nations Development Programme

ENVIRONMENT AND ENERGY

Definition

Standardized Baseline (or 'SB') is *'a baseline established for a Party or a group of Parties to facilitate the calculation of emission reduction and removals and/or determination of additionality for clean development mechanism project activities, while providing assistance for assuring environmental integrity'.*

(Decision 3/CMP6/Para44)

Introduction

In a popular fable, six blind individuals who have never known an elephant before, interpret their own version of the creature after sensing different parts of the same animal. Philosophical interpretations aside, the story highlights a human tendency to view issues through a particular lens and thus the need to have a common understanding or a 'basis' (an imagery line or value or scenario) from which issues (such as anthropogenic emissions) can be measured or compared.

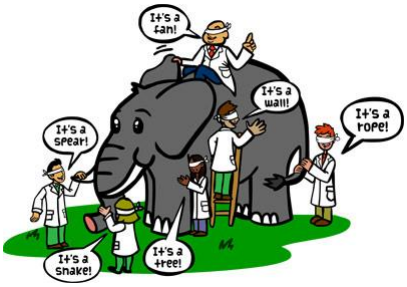


Fig 1: The need to have a common basis for decision making

The Clean Development Mechanism (CDM) Glossary[1] defines 'Baseline Scenario' as the scenario for a CDM project activity (CPA) that reasonably represents the anthropogenic emissions by sources of greenhouse gases (GHGs) that would occur in the absence of a proposed CDM project activity.

'Baseline Emissions' are GHG emissions that would occur in a Baseline Scenario. Standardization can be understood as adoption of a generally accepted procedure(s) to enable objective comparison or judgment to simplify and add more predictability to decision making. Thus, establishing 'Standardized Baselines' can help reduce transaction costs, enhance transparency, objectivity and predictability of CDM projects, while facilitating (quicker) access to carbon finance particularly for underrepresented regions and project types.

(Source 1: CDM Glossary - http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf)

Audience and Objectives of the Guide

The 'Procedure for Submission and Consideration of Standardized Baseline'[2] elaborates on the process for submission of SB and states that proposals can be submitted by a host country DNA and developed using either an:

- Approved CDM Methodology or Tool (primarily the 'Tool to determine the emission factor of an electricity system'), or
- 'Guidelines for the Establishment of Sector Specific Standardized Baseline'.

This Guidance Note (the 'Note') is intended primarily for Designated National Authorities (DNAs), Coordinating and Managing Entities (CMEs), and consultants involved with the development of SBs using the above stated Guidelines. The Note builds a case for SBs, provides a scheme to identify potential sectors and an outline for developing a 'Terms of Reference'. Thereafter the Note focuses on the current UNFCCC rules and regulations (Standards and Guidelines) with an emphasis on establishing a Quality Management System. The last section looks at the application of SB in the evolving climate change frameworks. The objective of this document is to make SBs comprehensible and easy to implement thus promoting its wider application across a broad range of relevant sectors.

(Source 2: SB Procedure - https://cdm.unfccc.int/Reference/Procedures/index.html#meth)

Why Standardized Baselines?

Consider the rice mill sector in the Kingdom of Cambodia. With over 27,000 mills of varying production capacity and fuel sources (e.g. use of diesel generators to supply electricity), mill owners looking to implement to implement CDM projects were deterred by several barriers including relatively small size of individual projects, long project cycle, and high transaction costs.

The proposed 'SB for energy use in rice mill sector of Cambodia'[3], developed by IGES, Japan for the DNA of Cambodia intends to tackle these barriers by making it easier for identification of a baseline, standardization of additionality demonstration, and making available an approved baseline emission factor. Unlike CDM methodology AMS-I.B for 'Mechanical energy for the user with or without electrical energy', the proposed SB reduces the number and complexity of monitoring parameters to two (2) from a maximum of six (6) as defined in the small-scale methodology while defining the default values for three parameters as shown below:

Emission Reduction (tCO_2) = Baseline Emissions (tCO_2) – Project Emissions (tCO_2)

- Baseline emissions = **Quantity of Milled Rice (tons of rice)** x Baseline emission factor for milled rice (tCO_2/ton of rice)
- Project emissions = **Diesel Consumed (liters)** x Diesel density (GJ/liter) x Emission factor (tCO_2/GJ)

The two monitored parameters under the SB are the quantity of milled rice and diesel consumed, while the default parameters were defined for the emission factors (milled rice and density) and the density of diesel.

(Source 3: SB Cambodia Rice Mills - https://cdm.unfccc.int/methodologies/standard_base/cambodia.pdf)

As can be seen from the above example, establishing a SB can help reduce monitoring of several parameters and therefore the need for multiple calculations on an individual project basis. SBs provides an agreed standard method of calculating GHG emissions for a defined project/sector type - thus **reducing time and costs** in comparison to large and small scale CDM methodologies.

In a project involving the rice mill sector in Cambodia, the process of standardization and data monitoring is aligned to the day-to-day operations of a rice mill, i.e. the quantity of rice milled and diesel consumed. This reduces the complexity of the data monitoring process encouraging a greater uptake for energy efficiency measures. Under the current UNFCCC regulations, this standardization can be defined for:

- Identification of the baseline emissions for a project or programme,
- Establishing additionality, and
- Calculation of baseline emissions;

! Note: When developing a SB, stakeholders can pursue either one or more of the above standardization, however this needs to be clarified in the Form '**F-CDM-PSB**' at the time of submission of documents to the UNFCCC.

Advantage to LDCs, SIDS and Underrepresented Countries

The definition and principles for SBs were formalized in 2010 at Cancun through the official Decision 3/CMP6, Section V[4]. The decisions encourage the development of SBs in Least Developing Countries (LDCs), Small Island Developing States (SIDS) and underrepresented countries (countries with 10 or less registered CDM projects as on 31st Dec 2010). Some of the key decisions include:

- Proposals for SBs can be submitted by project participants, international industry organizations, and observer organizations - through a host country DNA.
- Additionally, encourages the UNFCCC to develop SBs in consultation with DNAs and
- Recommends the exploration of different sources to finance the development of SBs for LDCs, SIDS and underrepresented project types and regions.
- Rests the application of a SB at the discretion of the host country DNA.
- Requests the UNFCCC to periodically review SBs (e.g. to ensure that SB reflects the current market scenario).
- And encourages Annex 1 countries to undertake capacity building and support the development of SBs.

(Source 4: SB Decision - http://unfccc.int/resource/docs/2010/cmp6/eng/12a02.pdf#page=2)

! Note: Unlike the submission for CDM Methodologies which can be undertaken by project participants, submission of SBs for approval to the Executive Board (EB) can be done only through **a host country DNA**.

Sector Identification for SBs

As the onus for promoting SBs lies with the DNA (typically located under a Ministry of Energy or Environment), this government agency is ideally placed to conduct a review of national and sectoral policies to determine the GHG potential of various sectors and sub-sectors within the host country. The process of identification for developing SBs should not only check for sectors/sub-sectors that can benefit from the process of standardization, but can also help identify "neglected" sectors that can potentially benefit from climate action.

! Note: The below flowchart (Fig 2) is aimed at supporting DNAs with the decision making process for sector identification, however it must be noted that the proposed scheme is elementary and requires the further development of a more robust decision making tool.

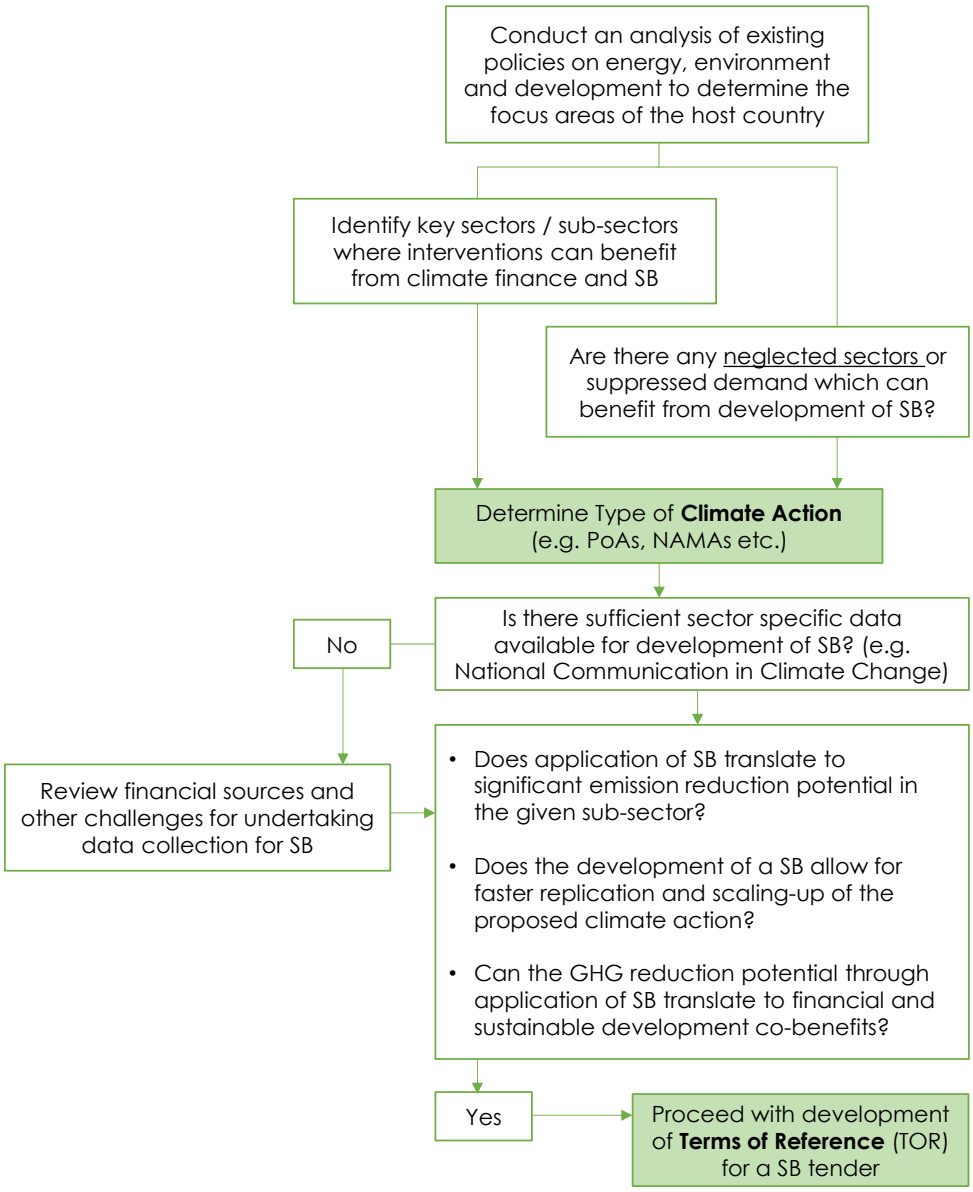


Fig 2: Schematic decision making process for SB sector identification

Developing a Terms of Reference

The nature of expertise required for developing SBs will require the participation of qualified 3rd party consultants to participate in a bidding process. As with any tender process, a well written TOR ensures greater clarity to the bidders while allowing the most qualified consultant to be shortlisted for the project activity.

! Note: A well drafted TOR should clarify the expectations, roles and responsibilities of the different stakeholders involved with the process, provide a plan for the overall activity, including follow-up. Time and effort spent in preparing a TOR can go a long way in ensuring the overall quality of the SB, its relevance and usefulness in undertaking climate actions.

Box 1: Contents of a TOR

Section 1 - General Conditions:

Section 7 - Experience and Expertise:

State knowledge and skills expected in the bidding entity:

- Familiarity with CDM procedures and guidelines for SB development;
- Proven record in writing of CDM methodologies;
- Experience in working on CDM project development with a variety of stakeholders, including government agenc NGOs, Civil Society, communities;
- Asset: Work experience in the particular sector/region

Standards and Procedures for Establishing SB

This section looks at the current UNFCCC decision making process and in the context of the 3 key documents:

- **Procedure for Submission and Consideration of Standardized Baseline**
- **Guidelines for the Establishment of Sector Specific Standardized Baseline**
- **Guidelines for Quality Assurance and Quality Control of Data Used in the Establishment of Standardized Baselines.**

The 'Procedure for Submission and Consideration of Standardized Baseline' (the 'Procedure') elaborates on the process for submission of a proposed SB by a host country DNA. The 'Guidelines for Establishment of Sector Specific Standardized Baseline' (the 'Sector Specific Guideline') provides a framework for development and assessment of SBs. The 'Guideline for Quality assurance and Quality control of Data used in establishment of SBs (the 'QA/QC Guideline') deals with quality assurance and quality control of data used in establishment of SBs. For a complete list of all relevant documents pertaining to SB, please refer to Box 2 below:

Box 2: Key Resource Database

Background / Decision:

- Decision 3/CMP6

Procedure:

- EB68/Annex 32: Procedure for submission and consideration of standardized baselines

Guidelines:

- EB 65/Annex 23: Establishment of sector specific standardized baseline
- EB 66/Annex 49: Quality assurance and quality control of data used in establishment of standardized baselines

Key Forms:

- F-CDM-PSB-RF: Request for funding for assessment report form
- F-CDM-PSB: CDM proposed standardized baseline form
- F-CDM-PSB-IA: CDM proposed standardized baseline initial assessment form
- F-CDM-PSB-REC: CDM recommendation form for proposed SB

(Note: The above documents have been updated up to EB75. The most up-to-date procedures, forms and other documents related to SBs can be found at: https://cdm.unfccc.int/methodologies/standard_base/new/sb6_index.html)

Procedure for submission and consideration of standardized baselines

Step 1 - Submission of a standardized baseline proposal to the CDM Executive Board:

As noted in the official Procedure (EB68, Annex32), SBs can be developed by a single or a group of parties and for a single or number of host countries; however the submission to the UNFCCC Executive Board (EB) must be done by a single DNA (mutually agreed between the parties) as schematically explained in Fig 3 below:

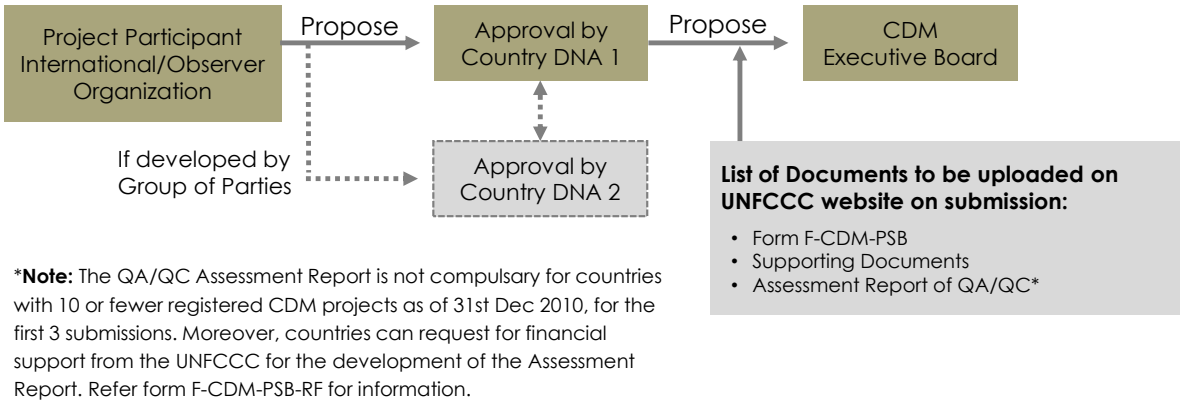


Fig 3: Submission of a SB proposal to CDM EB.

SB proposals can be developed by a single or a group of parties and for a single or number of host countries; however the submission to the UNFCCC Executive Board (EB) must be done by a single DNA (mutually agreed between the parties).

Step 2 - Initial Assessment:

Following the receipt of the SB proposal, the EB undertakes an initial assessment and provides feedback to the DNA. The typical number of working days for the assessment phase is indicated in Fig 4 below:

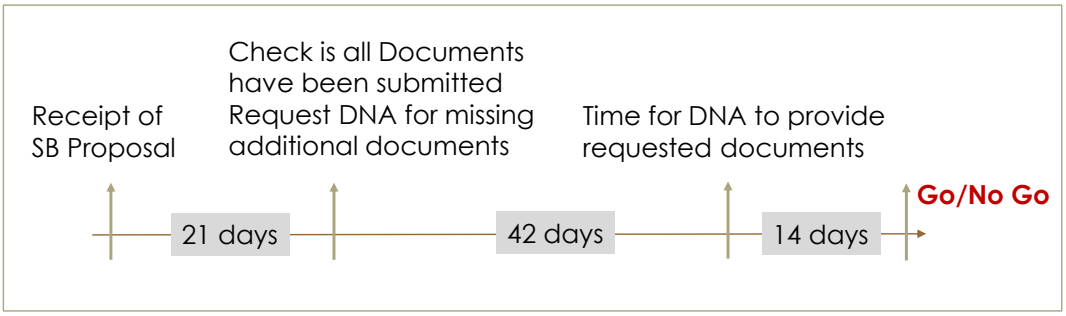


Fig 4: Initial assessment period

At the end of the assessment period, the EB informs the DNA whether the proposal meets the submission requirements (e.g. all appropriate documents have been submitted) and if found wanting can suspend the process until further notice.

Step 3 - Preparation of Recommendation and Final Decision:

Within 28 days of satisfactory conclusion of the initial assessment, the EB undertakes the following:

- Provides a reference number to the SB
- Makes necessary information publicly available on its website
- Prepares a draft recommendation

The draft recommendation may approve / disapprove the SB or request for additional information. Upon conclusion of the information exchange process with the DNA, the EB takes a final decision on whether to approve or reject the SB.

Guidelines for Establishment of a Sector Specific SB:

The Sector Specific Guidelines is applicable for 4 project categories for development od SB (referred to as 'Measures'):

- **Fuel and Feedstock Switch** (e.g. Carbon intensive with less carbon intensive fuel)
- Energy efficiency and Switch of technology with/without change of energy source
- **Methane destruction** (e.g. Recovery, flaring or capture of methane from landfills)
- **Methane formation avoidance** (e.g. Use of agriculture residues left to decay)

The premise for developing SB is made by comparing emission performance (refered as **'Performance standard'** in other SB literature) of similar project types (e.g. electricity can be supplied by harnessing coal, diesel, natural gas, biomass, etc.). This aggregation of similar project types or **'homogeneous group'** helps to determine the baseline scenario and a **'positive list'** of technologies / projects that can be deemed as automatically additional by defining a **'threshold'** limit. This is further explained through the example of 'SB for energy use in rice mill sector of Cambodia', below.

Box 3: The 4 steps in developing SB

- **Step 1**: Define the 'Level of Aggregation'
- **Step 2**: Establishing the additionality criteria – This pertains to defining a 'Positive list' of fuels / biomass or technologies that can benefit from the SB
- **Step 3**: Identification of baseline – e.g. Defining baseline fuel, best available technology (refer Example 3).
- **Step 4**: Determine the baseline emission factor as applicable

Step 1 – Level of Aggregation:

Aggregation of data is done by defining a **homogeneous group** consisting of the following factors. For the Cambodia rice mill sector, the level of aggregation was elaborated as:

- **Host Country:** Kingdom of Cambodia.
- **Sector:** Energy generating equipment in Rice Mill Sector. Either newly installed or retrofitted with the rated output capacity not more than 5 MW.
- **Output:** Milled Rice. Rice production is capped at 3,000 tonnes per year.
- **Measure:** Energy efficiency and Switch of technology

Step 2 – Establishing the Additionality Criteria:

Cambodia has 27,407 rice millers with annual milling capacity ranging from 1 to 48,000 tonnes/year of rice. As no relevant data was readily available, a data sampling was undertaken based on a sampling plan developed as per the 'Standard for sampling and surveys for CDM project activities and programme of activities'. The objective of the survey was to estimate the following:

- Types and contribution (%) of technology used at rice mills;
- Types and consumption (liter/year or MWh/year) of energy used at rice mills;
- Production (ton/year) of milled rice.

The rice mills were then categorized based on the technology (e.g. those dependent on diesel generators, power grid, rice husk gasification etc.) and arranged in descending order of carbon intensity as shown in Fig 5 below. The Sector Specific Guideline further requires an analysis be undertaken for technologies that are deemed less commercially attractive and by comparing existing regulations.

The threshold criteria (see **'Threshold'** below) was then applied for determining the **'positive list'** of technologies for additionality.

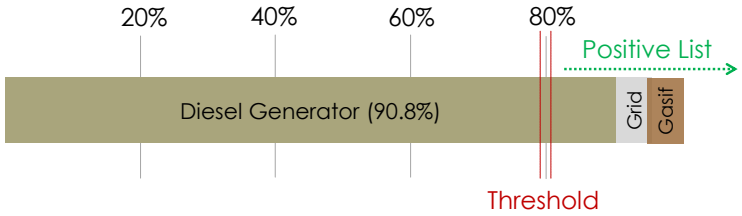


Fig 5: Determining the positive list and baseline technologies

Step 3 - Identification of Baseline:

The Sector Specific Guideline notes that the lowest emission factor amongst the technologies within the threshold (i.e. to the left side of threshold limit in Fig 4 above) should be considered as the baseline. In the above example, only one technology was identified within the threshold and the baseline identified was thus diesel generators. This technology was then used to calculate the emission factor.

Step 4 - Baseline Emission Factor:

For the Cambodia rice mill sector SB, the baseline emission factor calculation was undertaken for 2 categories of mills based on rice production capacity: (a) those with annual capacity less than 1,000 tonnes/year, and (b) those between 1,000 – 3,000 tonnes/year). This was done based on approved CDM Methodology (AMS I.B) using a sampling method.

Developing SB for Electricity Grids

This Guidance Note focuses on developing SB using the Sector Specific Guideline, however one of the more popular use of SB is to determine the regional / national grid emission factor using the 'Tool to determine the emission factor of an electricity System'. In the case[5] for 'Grid Emission Factor for Southern African Power Pool', the SB was defined for multiple participants including Botswana, Congo (DRC), Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, with data provided by the respective national power companies and the Southern African Power Pool Coordination Centre.

(Source 5: GEF South African Power Pool - https://cdm.unfccc.int/methodologies/standard_base/southernafrica.pdf)

Threshold

At EB65, the UNFCCC Executive Board approved the threshold limits for priority sector (Energy for households and energy generation in isolated systems) at 80% and for all other sectors at 90% on an interim basis while agreeing to develop options for threshold values in consultation with relevant stakeholders and experts.

At the time of writing this document, a draft guideline 'Determination of baseline and additionality thresholds for standardized baselines using the performance-penetration approach' was available, to determine threshold limit for projects involving 'technology switch'.

The performance-penetration approach is based on determining the baseline technology based on the principle of common practice. Common practice refers to technologies with a performance range (i.e. the relative emission factor of a technology as compared to the maximum emission factor of all technologies in the sector) less than 20% and a penetration range (share of output against overall output in the given sector) of greater than 50%.

As shown, in the Fig 6 below, the principle of this approach is to distinguish between the prevailing common practice and the 'inflection point' which is then considered as the new threshold limit.If such common practice and inflection point cannot be clearly defined, the guideline recommends the use of existing interim values (i.e. 80% or 90% as applicable).

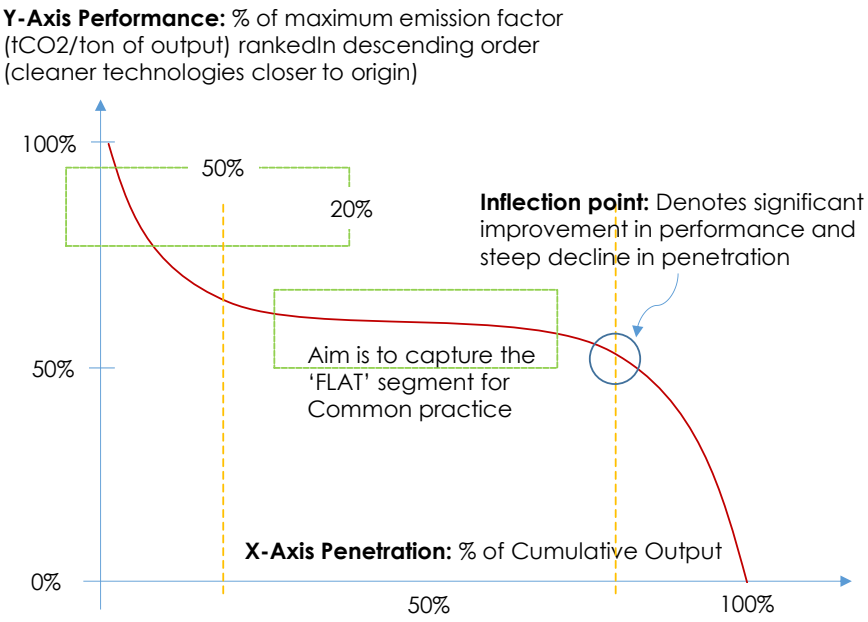


Fig 6: Inflection point determines the threshold limit

Limitations of the current SB Process:

The current SB process under the UNFCCC is governed by the Procedures and Guidelines noted in Box 2. However, given that the process started only in 2010, there is sufficient scope for improvement. Some of the current limitations of the Sector Specific Guideline is discussed below:

- **Project Type:** The Sector Specific Guideline provides a list of 4 project types and is therefore not applicable to various other sectors (e.g. transportation). However, it is understood that this Guideline is a first step and additional procedures and guidelines will be developed for other sectors in the future.

- **Singular Approach:** The Sector Specific Guideline provides a single approach for developing a SB. As noted in the Cambodia rice mill sector example, this raises several concerns – e.g. production capacity of the mills range from 1 – 48,000 tonnes/year with varying electricity requirement and includes both new and retrofitted energy systems. The approach suggests that a single baseline emission factor be used for the entire country irrespective of the differences in efficiency (i.e. smaller rice mills would typically be less efficient therefore generate more emissions per tonne of rice produced as compared to a larger rice mill).

  This issue was partially resolved by classifying the rice mills by capacity (< 1,000 tonnes, 1,000 – 3,000 tonnes and > 3,000 tonnes with the decision to exclude the later) and engine capacity (< 5MW). However, this approach of surveying existing plants (many operational for more than 10 years) may work for retrofit projects but is unjustified when comparing the performance and efficiency of new rice mills. This can effectively lead to lower or higher number of carbon credits being issued as compared to a standalone CDM project scenario, undermining the exercise.

- **Data Collection:** The Sector Specific Guideline requires the level of aggregation to be made from a homogeneous group. While this may be easy to define for certain project types, it may be challenging for other project types (e.g. Industrial energy efficiency). Similarly the level of data required may be fairly detailed (e.g. efficiencies, costs, etc.) and certain data may be proprietary or establishments may refuse to divulge financial or day-to-day operations data.

- **MRV System:** The success of GHG abatement actions are dependent on a robust system to measure, report and verify (MRV) the emission reduction activities. As the objective for establishing SB is to allow scaling-up of mitigation activities while reducing time and cost, standardization of MRV systems finds no mention in the current guideline.

- **Voluntary Usage:** A Swedish Energy Institute paper[6] appropriately points out that the existing rules allow project developers to select between project specific or standardized approach leading to its selective usage based on the method that provides higher emission reduction, thus diluting effectiveness of SB.
  (Source 6 – SEI Paper: http://sei-us.org/Publications_PDF/Policy-paper-2012-Standardized-baselines-CDM.pdf)

Box 4: Supressed Demand

Suppressed demand, i.e. a situation where poverty or lack of access to energy is a barrier in providing the minimum required energy services to meet the end-users basic or human development needs, is a concept well understood in CDM. Suppressed demand can take the form of energy use – lighting, cooking, and rural electrification; access to potable water, water heating, sanitation, goods etc.

However the sector specific guideline is limited when accounting for suppressed demand in comparison to CDM methodologies for rural electrification. Consider a programme that tackles rural healthcare by improving access to clean water for consumption and sanitation. In such a scenario access to potable water maybe suppressed and the homogenous group for water purification may consist of several technologies such as electricity for filtration or reverse osmosis, boiling of water using fossil fuel etc. As observed in Fig 7 below, the current guideline is limited when developing a SB under a suppressed demand scenario.

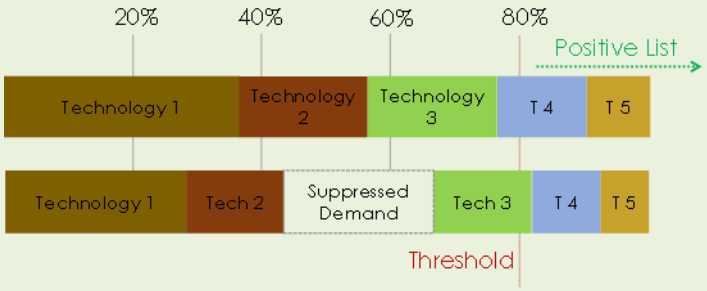


Fig 7: Impact on the positive list due to suppressed demand consideration.

! Note: The UNDP Study on SB Assessment for Rural Off-Grid-Electrification in Sub-Saharan Africa provides an overview of SB in the context of the development of decentralized energy generation facilities in rural areas. The study can be found at:

http://www.undp.org/content/undp/en/home/librarypage/environment-energy/mdg-carbon/standarized-baseline-assesment.html

Overcoming Challenges for Structuring and Implementing SB:

The Sector Specific Guideline requires significant data to be collected based on various parameters which may not be readily available in many countries. In many cases, the data may be made available through multiple sources (e.g. empirical data sources or equipment manufacturers) leading to higher costs and processing time, which are the very factors that SB tries to tackle. Moreover the existing approach of benchmarking against similar technologies, fuels, and feedstock may not be applicable for all project types. Some of the challenges in implementing SBs can be tackled as below:

- **Make SB Mandatory:** In line with national policies DNAs may define certain priority sectors for the development of SB and the current option to pursue a project specific approach should be withdrawn or made sufficiently conservative.

- **Applicability Criteria:** To reduce the scope of data collection and improve the effectiveness of SBs, DNAs can establish certain ground rules, e.g. allow large-scale projects to pursue a project specific approach and encourage small-scale projects to be included under a SB. This would automatically reduce the measures required for consolidation of data.

Similarly distinctions can be made based on market penetration for a given technology or commonly known emission levels (e.g. SBs for transportation sector can be determined from global data sources and international emission standards).

- **Linking thresholds with country-specific conditions:** As threshold percentiles are a key factor that defines whether projects can be considered eligible for the positive list, setting the bar at a relatively high level may lead to exclusion of otherwise 'additional' projects. Similarly, setting the threshold value too low may lead to the opposite and allow project developers to take advantage of the system. While a single threshold limit may lead to less complications in the standardization process, linkages with best available technology, a country's emission reduction goals, and socio-economic developmental issues can lead a more realistic approach to the threshold value setting.

- **Industry Associations:** To partly overcome the issue of data unavailability, SB development can be led or based on industry-specific associations (e.g. steel or cement industry association). If such associations do not exist within a particular host country then information can be collated from similar countries (e.g. based on social, geographic or economic similarities) or international associations with suitable adjustments made to account for the country-specific conditions.

Box 5: Simplifying SB for Rural Electrification

Given the difficulties in data collection for rural energy projects, especially in LDCs and SIDS; DNAs, and stakeholders involved with developing SB need to think innovatively when collating data. Two studies, the 'SB Assessment for Rural Off-Grid-Electrification in Sub-Saharan Africa' (UNDP) and 'Promoting Energy Access Projects under CDM' (World Bank) provide several recommendations:

- **Default Values:** DNAs can recommend the use of default values from well-established sources (e.g. IPCC guidelines).

- **Secondary Data Sources:** The World Bank study points to several secondary country specific data sources such as the International Energy Agency, Food and Agriculture Organization etc., and DNAs should collectively pursue with the UNFCCC to allow the use of data from such secondary sources.

- **Data Frequency and Data Vintage:** The current requirement for mandatory update of SB data is set at 3 years which may be expensive for LDCs and SIDS. The World Bank study recommends that the SB data be cross-checked with a relevant indicator such as market penetration every three years with a predefined target while updates are made every 5 years when the targets are met.

- **Data Collection:** The UNDP study highlights the practical challenges when conducting surveys in geographically remote areas. It starts with appointing a set of competent entities with skilled staff. The consortium on entities need to collectively possess CDM proficiency, technical competence and local knowledge. While CDM methodologies require specific data parameters, the local conditions may vary significantly and require the intervention of a technical expert to find the most appropriate solution. Similarly, language and cultural empathy may be essential in securing the right information and understanding from the local population.

! Note: It is recommended that DNAs take a more active role in defining the process taking country-specific factors including national and sectoral policies into account and benefit. Recognizing that DNAs do have limited resources, they are encouraged to address and coordinate these actions with capacity development programmes who may add know-how and grants to support well defined actions.

Box 6: Community of Practice

The UNDP has established a Community of Practice with the objective to bring together DNAs, CMEs and other public, commercial and not-for-profit entities that are engaged in carbon finance and climate change activities. The practice space will allow for rich discussions and extended learning opportunities through regular invitations of renowned international carbon finance experts. Participants will have the opportunity to share their experiences on developing and implementing programmatic approaches, establishing standardized baselines under the CDM but also learn more about the key drivers of change – NAMAs, New and Non-Market Mechanisms and the Durban Platform with legally binding targets for all post-2020.

For more information, refer: http://www.climatefinanceoptions.org/cfo/communities

Quality Control & Quality Assurance Management Systems

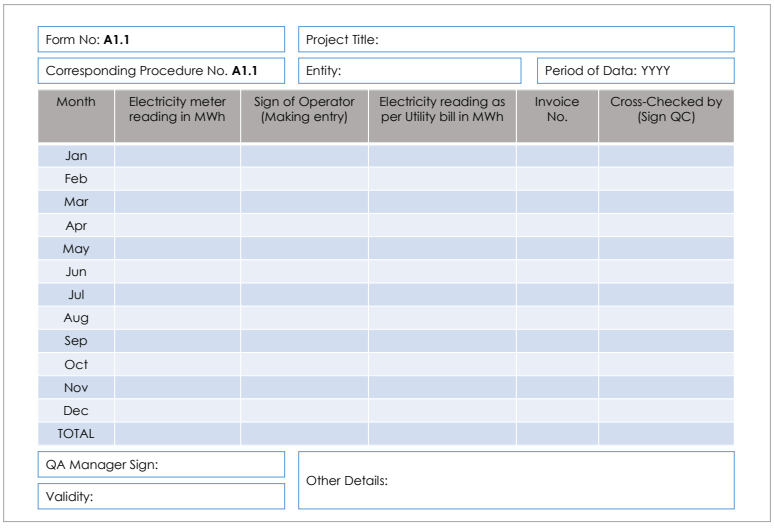
Defining the level of aggregation and collection of quality data is one of the key challenges in the determination of SB. The 'Guidelines for Quality Assurance and Quality Control of Data Used in the Establishment of Standardized Baselines' (the 'QA/QC Guideline') defines best practices for data collection, processing, compilation and reporting of data. The QA/QC Guideline is aimed at DNAs, DOEs and SB developers to support the development and submission of an Assessment Report.

Quality Control (QC) is a technical procedure to measure and control the quality of data inventory as it is being developed. The characteristics of QC systems are:

- Ensure data integrity, correctness and correctness.
- Consist of procedures for consistent and routine checks.
- Make provisions to identify and address errors and omissions
- Allow for documentation, archiving and recording of all activities.

Quality Assurance (QA) is a review process of the QC ideally conducted by personnel not directly involved with the QC procedures.

A QA/QC Management systems can be set up using a system of standardized 'Forms' and 'Procedures' (not to be confused with 'Procedure for Submission and Consideration of Standardized Baseline'). Forms are templates requesting for specific information and an easy to follow nomenclature system. Procedures provide instructions and additional information for the specific information requested under the Forms. The collective set of Forms and Procedures for the entire QA/QC process forms the QA/QC Management System as shown in Fig 8 and 9 below.



Form No: **A1.1** | Project Title:

Corresponding Procedure No. **A1.1** | Entity: | Period of Data: YYYY

Month	Electricity meter reading in MWh	Sign of Operator (Making entry)	Electricity reading as per Utility bill in MWh	Invoice No.	Cross-Checked by (Sign QC)
Jan					
Feb					
Mar					
Apr					
May					
Jun					
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
TOTAL					

QA Manager Sign: | Other Details:

Validity:

Fig 8: Example of a data 'Form'.

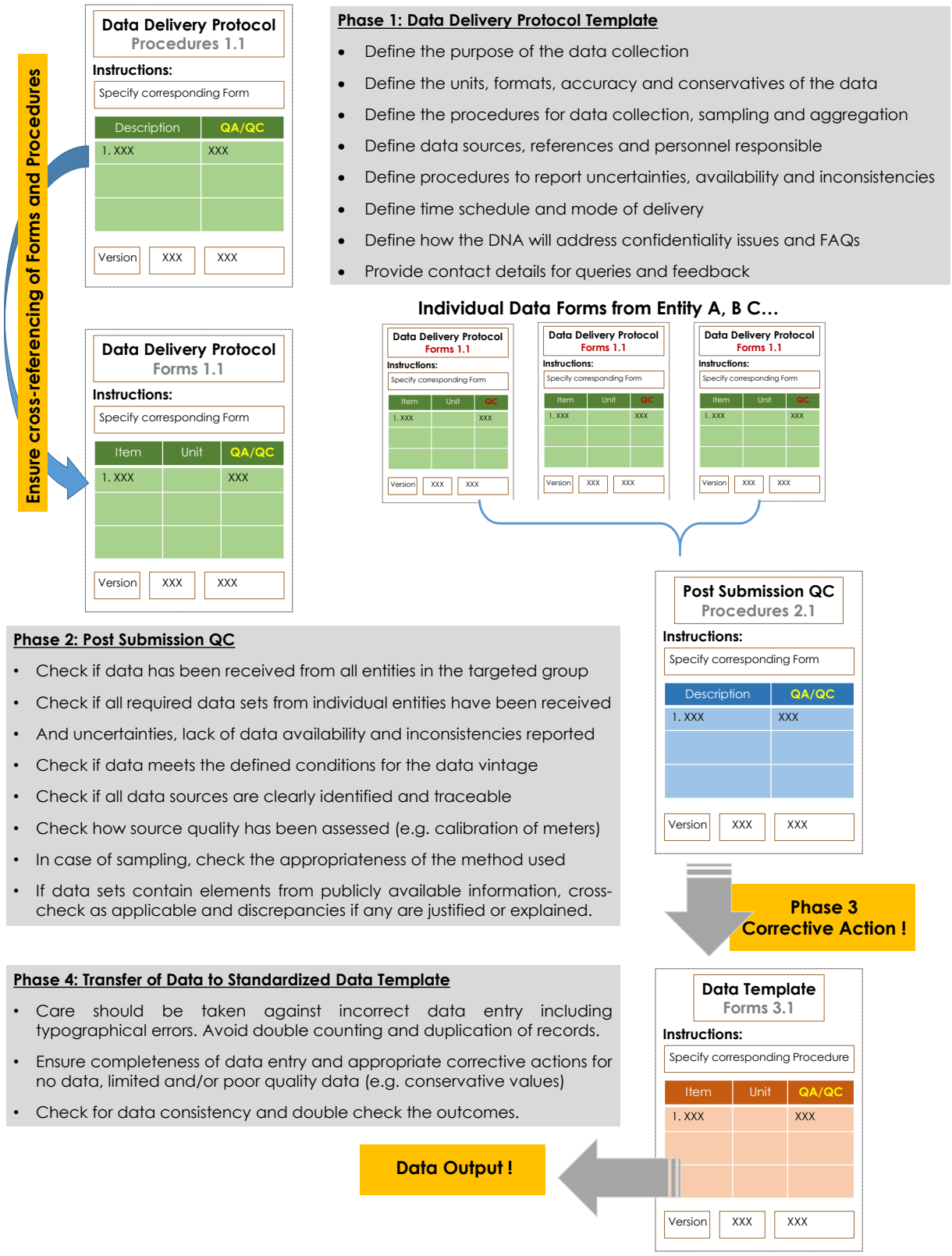


Fig 9: Schematic flow for a QA/QC Management System.

Rethinking SB – Bridging the Gap

The development of a SB is based on setting a target criteria or benchmark for a homogeneous group of technologies, fuels, or feedstock. This benchmark is set with an objective to reduce the combined emissions (i.e. performance) for all participating entities in the homogeneous group. However this benchmark can be reviewed periodically to achieve benchmarks from best available technology.

Example - Energy Efficiency in Boilers:

Typical boilers have life spans ranging between 25-50 years with the energy efficiency gradually decreasing over time due to general wear and tear, accumulation of deposits, slag (due to burning of fuel), and other factors. Measures to improve boiler efficiency include extensive retrofit, addition of fuel additives (i.e. improve the heat content of fuel), or implement fire-side cleaning technology. Use of different technologies lead to different efficiency levels of the boilers. Fig 10 below provides a schematic representation of efficiencies when applying different technologies (including best available technology) as compared to the efficiency of a new boiler.

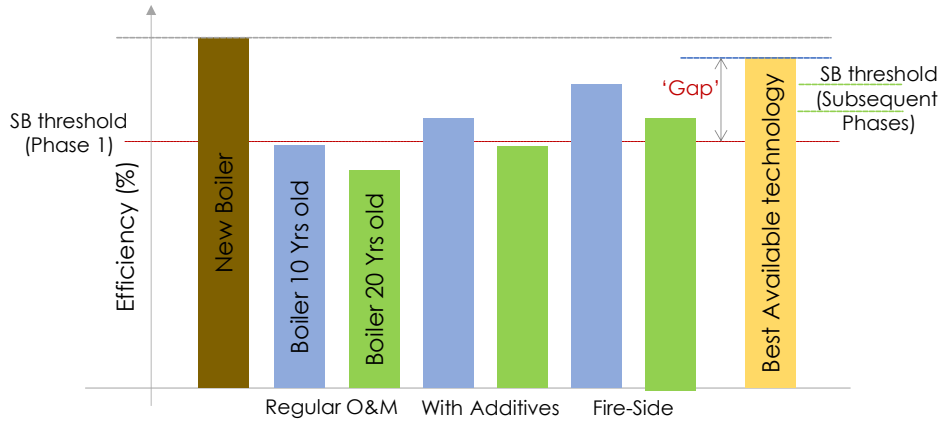


Fig 10: Boiler efficiency based on multiple scenarios (Values are indicative)

Bridging the GAP: Implementing best available technology (BAT) needs time and money. An analysis of the financing requirement to adopt BAT can allow for a practical approach to threshold setting over time. As SBs are periodically reviewed, the threshold limit can be gradually changed in favour of BAT. Such well-managed measures communicated in advance will encourage democratic adoption of efficiency measures.

Companies seeking to adopt (more expensive) BAT can do so early in the phase thus benefitting from carbon credits over a longer duration whereas those seeking incremental improvements (at relatively lower cost) can choose to make the change-over at a later stage with the knowledge that the 'window of opportunity' to earn carbon credits is limited.

Rethinking SB – Nationally Appropriate Mitigation Actions

Nationally Appropriate Mitigation Actions (NAMAs) are widely understood as strategy based policy instrument to support voluntary climate change actions by developing countries enabled through financing, technology support, and capacity building in a measurable, reportable and verifiable manner. Hence, the scope of NAMAs is focused on wider scale of activities from a larger set of participants. As countries develop NAMA strategies, emission reductions maybe the primary but not the only parameter that will need monitoring.

In Fig 11 below, the value chain for a sustainable charcoal NAMA consists of several sub-components with actions recommended for each component (e.g. practice sustainable forestry measures when producing charcoal). Each action leads to specific measurable outcomes (e.g. change in forest cover due to sustainable forestry), thus leading to monitoring of several parameters. In such a scenario, a SB can prove to be a highly effective carbon metric simplifying the MRV systems. The international support of the NAMA can be built on a simple concept where the climate action to achieve sustainable emission reductions is based on the SB. This will allow parties involved (e.g. donor and host country) to have a common basis for emission reduction computation allowing for a win-win situation.

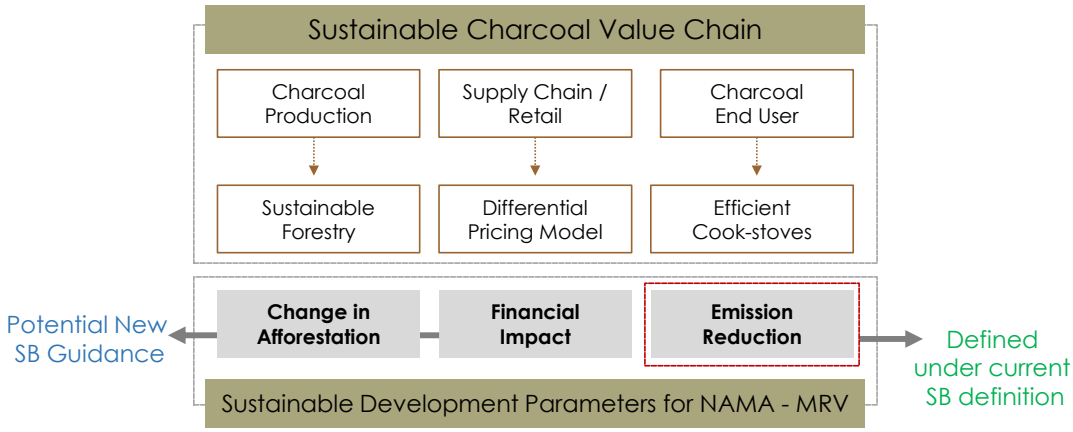


Fig 11: Role of SB in the context of a sustainable charcoal NAMA

Resources and Additional Information

! Note: The **UNFCCC** currently provides up to USD 20,000 towards selection and appointment of DOE to undertake the QA/QC Assessment Report. To secure this funding, an application using form **F-CDM-PSB-RF** must be made to EB along with evidence of communication with 3 DOEs and justification for the selection of a DOE.

The **UNDP MDG** unit (www.mdgcarbon.org) is UNDP's corporate framework for carbon finance and is looking at capacity building, PoA support and development of SBs and NAMA concepts that build the carbon metric on SBs. For additional information contact:

Ms. Alexandra Soezer, Ph.D.

Project Manager MDG Carbon

United Nations Development Programme

304 E 45th Street, FF-910

New York, NY 10017, USA

alexandra.soezer@undp.org

Phone: +1-212-906-6433

Other support and funding sources can be found at:

- Asia Development Bank's Carbon Market Initiative http://www.climatefinanceoptions.org/cfo/node/56
- Institute for Global Environmental Strategies, Ministry of Environment, Japan http://www.iges.or.jp/en/
- UNFCCC Regional Collaboration Centers for Togo, Uganda, Grenada, Colombia
  http://cdm.unfccc.int/stakeholder/rcc/index.html
- Global Environment Centre Foundation, Ministry of Environment, Japan http://gec.jp/main.nsf/en/-Contact
- African Carbon Asset Development: http://www.acadfacility.org/apply.php
- KfW Carbon Fund: http://www.kfw.de
- GIZ, Germany: http://www.giz.de/Themen/en/28915.htm
- World Bank's Carbon Initiative for Development: https://wbcarbonfinance.org/Router.cfm?Page=CIDEV&ft=About

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Contact Information: Ms. Alexandra Soezer, Ph.D. Project Manager MDG Carbon, alexandra.soezer@undp.org

For more information: **www.undp.org/**
United Nations Development Programme
One United Nations Plaza • New York, NY 10017 USA