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Integrating Africa's Least Developed Countries into the Global Carbon Market

Standardised Baselines and LDCs – Concept, Issues, and Opportunities

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CDM Background Study

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1 INTRODUCTION AND BACKGROUND

The baseline of a CDM project activity forms the basis for the calculation of the emission reduction of the particular project. It represents the hypothetical emissions that would occur if the project were not implemented. Thus far, baselines have generally been determined on a project-by-project basis. This process is perceived by many as long, difficult and costly (UNFCCC Secretariat 2012a). It especially hampered CDM project development in Least Developed Countries (LDCs), as the small and microscale projects, which dominate in these countries, suffer heavily from the transaction costs that, inter alia, are caused by, inter alia, baseline development.

This paper examines another kind of baseline, which is not determined using a case-by-case approach. This kind of baseline is generally referred to as "standardized baseline" (SBL). Using standardized baselines, baselines for CDM project activities and Programmes of Activities will not need to be developed on a case-by-case basis, which leads to easier scaling-up especially of measures targeting many dispersed and small-scale emission sources (IETA 2009).

We set out to explain the concept of standardized baselines, look into sectors which seem especially suited for the use of standardized baselines in LDCs, examine actors that could develop such baselines, and identify some of the barriers to their development. We conclude with a summary and a short outlook.

1.1 What are Standardized Baselines?

Since the Subsidiary Body for Technological Advice (SBSTA) was requested to recommend modalities and procedures for standardized baselines at the UN Climate Change Conference in Copenhagen 2005, the concept of standardized baselines has started to gain more attention. In Cancún the following year, Parties defined standardized baselines as

> *"a baseline established for a Party or a group of Parties to facilitate the calculation of emission reduction and removals and/or the determination of additionality for clean development mechanism project activities, while providing assistance for ensuring environmental integrity" (Decision 3/CMP.6)*

A standardized baseline is not determined on a project basis. Instead, it is calculated using a general standard estimation of GHG emissions that would occur if the project types it is aimed at were not implemented. So a standardized baseline can be applied for any number of projects within the boundaries defined by the baseline (e.g. regional, economical, sectoral etc.). Standardized baselines also allow multiple measures within a sector, if a combined emission factor for these measures within the sector is calculated. If the sector is not homogeneous, it may be broken down into sections which have their own standardized baselines (CDM EB 2011).

Generally, the establishment of a standardized baseline can also entail a standardized method of additionality testing, hence lower transaction costs in this regard. However, for project development in Least Developed Countries this is less of an important factor, as small- and microscale project activities prevail, which do not require special additionality tests since the guidelines for demonstrating microscale-additionality (CDM EB 2012a) can be applied.

A standardized baseline can also build upon the concept of suppressed demand, i.e. take into account so far unfulfilled basic human needs, e.g. basic energy service. In the baseline, these are set as the so-called 'minimum service level'. Thus, the baseline would be above the actual

current emissions, but lower then what is expected if economic development followed a business-as-usual path. Such a baseline can be set *ex-ante* using standard indicators from literature and case studies of similar countries.

1.2 Expectations

Standardized baselines are expected to have a range of advantages over "traditional" baselines. Marr (2012a) summarizes their benefits as follows:

- higher efficiency: SBLs are associated with lower (transaction) costs, less complexity, faster implementation speeds, and less regulatory uncertainty. This would lead to improved time-to-market of CDM projects, and consequently to faster issuance of CERs than is the case with current setups.
- enhanced environmental effectiveness: SBLs should provide increased objectivity, transparency and objectivity as well as a simpler project monitoring approach. Their more holistic and integrated design, together with a more flexible choice of technologies, should increase the number and range of CDM projects.
- more equitable: SBLs should improve underrepresented countries' and regions' access to CDM project activities, as project developers benefit from lower transaction costs (see above). Also, once an SBL is established, the burden of baseline-setting is removed from project developers, as the baselines already exist and can be accessed centrally. This could also mediate problems of data quality and cost and inconsistencies in datasets (cp. also chapter 3).

1.3 Provisions of the CDM Executive Board

In Cancún, the CMP requested the CDM Executive Board to

> *"develop standardized baselines, as appropriate, in consultation with relevant designated national authorities, prioritizing methodologies that are applicable to least developed countries, small island developing States, Parties with 10 or fewer registered clean development mechanism project activities as of 31 December 2010 and underrepresented project activity types or regions" (Decision 3/CMP.6).*

The CDM Executive Board has already taken steps to integrate SBLs into the CDM. At EB62, the Board adopted *guidelines for the establishment of sector specific standardized baseline*, and revised them at EB65 (CDM EB 2011). These guidelines are mandatory, non-exhaustive and allow future updates to expand their scope to other appoaches and measures.

At this point in time, the guidelines apply to four types of measures: fuel and feedstock switch; switch of technology with or without change of energy source (including energy efficiency improvement);methane destruction; and methane formation avoidance.

The guidelines foresee four general steps for the establishment of an SBL:

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

The data used for the establishment of the baseline should not be older than three years, and the baselines should also be updated every three years.

Data quality is one of the crucial challenges in the development of baselines. Especially when establishing an SBL that is supposed to apply to multiple projects, it is absolutely necessary that the data used is conservative, reliable, transparent and traceable. At EB 66, the Board therefore adopted *guidelines for quality assurance and quality control of data used in the establishment of standardized baselines*(CDM EB 2012b), which lay out provisions and processes to ensure quality of data, and on data collection, processing, compilation and reporting (ibid.).

The guidelines establish that the Designated National Authorities (DNAs) assure data quality through *Quality Control* (QC), assessing and maintaining data quality routinely, and *Quality Assurance* (QA), which is to ensure that the DNA's QC system is designed to meet data quality objectives, and which is to be reviewed by Designated Operational Entities (DOEs).

The guidelines provide detailed provisions on how the QA and QC system is to be established, including the encouragement to use sector-specific data templates provided by the Secretariat which the DNAs are to complete with the most recent data available. The data provided in these templates should also be as complete and accurate as possible, covering all installations relevant for the baseline and avoiding duplications of data. If possible, DNAs should hold public consultations on the establishment of the proposed SBL.

The assessment and control of data quality for the establishment of an SBL puts a very heavy burden on the DNAs, which could pose a problem especially in LDCs, and may deter them from the formulation of such baselines (see section 3 of this paper).

Other Standardization Tools in the CDM

The CDM already uses a variety of standardization tools apart from SBLs, which can be also relevant for the establishment of standardized baselines. These include:

- Common estimation measures that are used across methodologies;.
- Positive lists of project types or PoAs, or of certain types of technologies that are automatically deemed eligible or additional. Negative lists are used for the opposite.
- Default values e.g. of fuel emission factors, electricity grid emission factors, equipment lifetime, or emssion reductions of equipment used, derived from public sources or politically agreed *ex ante*;
- Market penetration levels for the identification of the use of project activities or technologies based on market share;
- Emission performance standard/benchmarks for the evaluation and comparison of performance of similar installations.

Source: Platonova-Oquab et al. 2012

AT EB 68, the CDM Executive Board also adopted the revised *procedure for submission and consideration of standardized baselines* (CDM EB 2012c). It stipulates that

> *"Parties, project participants, international industry organizations or admitted observer organizations may propose a standardized baseline through the DNA of a Party for which the standardized baseline is proposed. The DNA shall subsequently submit the proposed standardized baseline to the secretariat" (ibid.)*

The procedure lays out rules for the submission of the SBL, including the use of a special submission form provided on the CDM website, relevant documentation and a data quality assessment report.

For the latter, Parties with 10 or fewer CDM project activities registered before 2011 may request funding of up to USD 20.000 from the UNFCCC.

The procedure also gives a timeline within which the secretariat has to assess the submission (21 days) and, after this, recommend adoption, revision or dismissal of the EB (28 days). If within this timeframe no Board Member objects, the secretariat's recommendation is deemed approved by the Executive Board. If there is an objection, the case is considered at the next Board meeting. If the proposal is rejected, the DNA may revise the SBL and resubmit it.

The procedure further establishes that new or revised sector-specific data templates may be proposed, which are then to be assessed by the secretariat. If the data template is thought to be incomplete, it is to be reviewed by two independent experts. A data template that has passed the assessments is then made public on the CDM website, and can be used by other project proponents for the establishment of an SBL.

2 PROMISING AREAS FOR THE USE OF SBLS IN LEAST DEVELOPED COUNTRIES

2.1 Basis for Standardization

Not all sectors are equally suited for standardization. While every sector needs to be assessed individually, some general criteria need to be addressed in any case:

- Data availability: Setting standardized baselines is a data-intensive process. Depending on the sector, a wide range of data needs to be compiled. Data needs vary with the sector, but in every case the data quality needs to be high in order to ensure environmental integrity of the baseline. The development of a standardized baseline is highly cost-intensive upfront even with readily available data (Castro 2010).
- Geographical scope and level of aggregation: Not every region of the world shows the same level of technological development, climatic and national circumstances. Therefore, sectoral baselines have to take these factors into account - different countries or regions will often need different baselines. It is possible to overcome such differences through baselines that are highly aggregated, e.g. in terms of technologies, geographical area or target groups. Anyhow, these cannot differentiate specific differences. Therefore, highly aggregated baselines would need to be highly conservative and may lead to significant undercrediting (Eichhorst et al. 2010).
- Comparability: The plants or installation covered should show a certain homogeneity in order to keep the level of aggregation low (UNFCCC 2010).
- Mitigation potential:As the development of a standardized baseline is a cost-intensive process, especially sectors with a high potential for scaling up GHG emission reductions, at best over several countries or regions. These reductions should be achievable at the lowest possible cost in order to reap high profits from the carbon market (Müller et al. 2011).
- Contribution to sustainable development: Standardized baselines can significantly contribute to sustainable development because they are especially suited for small dispersed mitigation activities that are most prevalent in LDCs and low-income countries. Such sustainable development benefits could be social (e.g. alleviation of poverty, improved access to energy), economic (e.g. job creation), or environmental (e.g. improved biodiversity, air quality) (Müller et al. 2011).

2.2 Standardizingbaselines for specific project types

Identifying sectors where setting a standardized baseline seems promising is a highly research-intensive process. In a pilot study for the UK Department for International Development (DFID), Müller et al. (2011) identified a range of project types that lend themselves well to the standardization of baselines in LDCs. In an earlier study, Eichhorst et al. (2010) examined the use of SBLs specifically for the transport sector. Also, a small number of standardized baseline methodologies for small-scale project activities have been submitted for approval to the CDM Executive Board.

So far, only few methodologies use standardized approaches to calculate their baseline emissions. Especially methodologies for small- and microscale project activities aresuited for Least Developed Countries, and thus were given priority in the examples below.

Efficient lighting
For this project type, two standardized small scale methodologiesare already available:
AMS-II.J (Demand-side activities for efficient lighting technologies) is used for switching from incandescent light bulbs to CFL or LED lighting. A number of PoAs already use this methodology, as it can be easily replicated even on large scales and promises good returns on investment.Müller et al. (2011) concluded that the methodology is already sufficiently standardized and would therefore not benefit from further standardizing baselines.

AMS-III.AR (Substituting fossil fuel based lighting with LED/CFL lighting systems) is a method for replacing e.g. kerosene lamps with more efficient electricity based lamps. This methodology also uses standardized approaches for its baseline determination. Müller et al. (2011) subsume this project type under rural electrification, as a switch to lighting systems based on electricity would likely be integrated in a broader rural electrification concept (see below).

Rural electrification
The mitigation potential of rural electrification is not easy to calculate - Müller et al. estimate a global potential of 200 $MtCO_2$ per year for lighting alone. Reductions could be achieved at about EUR 7.80/tCO_2eq. The measures would have a strong benefit for sustainable development, such as reduced indoor polllution and poverty reduction.
The small-scale approachesfor this type of project activity (e.g. AMS-1.A, AMS-I.L; AMS-III.AW) make no use of standardized baselines as yet. It has been argued that the reason for their very limited use lies in the necessity to monitor large numbers of small-scale activities (Pöyry 2011).
As currently the baselines can be derived from suppressed demand and different energy patterns, baseline setting is difficult. Müller et al. find that by calculating SBLs using "certain assumptions and parameters on fuels, energy service and prices could greatly decrease the complexity of baseline identification and measurement" (Müller et al. 2011).

In August 2011, the World Bank, DFID and Pöyry Management Consulting jointly submitted a proposal on a new baseline methodology for the electrification of rural communities, which currently awaits approval by the CDM Executive Board (SSC-NM073). The proposed methodology "covers grid, mini-grid and off-grid (facility scale) electrification, and includes different baseline scenarios for household lighting, household appliances and other customer groups" (ibid.). The methodology proposes a "tiered" approach to baseline setting, where the baseline emission reductions are estimated based on international default baseline emissions factors (Tier 1). Host countries and Project Developers can propose higher values based on national default values (Tier 2) or even on a project basis (Tier 3), if they can properly justify them. In all cases, baseline emission factors would be set *ex-ante* (see Pöyry 2011).

Also included is a proposal to use a suppressed-demand baseline approach to derive a minimum service level for household lighting, leading to a "cap" on baseline emissions of 0.75tCO_2/year (ibid.).

Cook stoves

Project activities introducing more efficient cookstoves to households yield a global potential of up to 1000 MtCO_2 per year, at a cost of less than EUR 5/tCO_2eq., according to Müller et al. (2011). The measure also has highly positive impacts on health of women and children and reduced deforestation.

Current cookstove projects derive baselines on a per-project basis (e.g. AMS-I.K, AMS-II.G). However, the main factors impacting the baselines are the fuel type used and the efficiency level of pre- and post-project stoves. If these two were to be standardized, the baseline would be accurate enough for specific geographical areas (Müller et al. 2011). However, standard fuel-consumption baselines would have to either be set for all different types of cookstoves, or the baseline would have to be aggregated to a very conservative value (Tran 2011). This would ensure environmental integrity, but may render certain types of cook stoves unattractive for project activities.

Charcoal

Especially in Africa, chacoal from non-renewable biomass is one of the main sources of domestic fuel. Charcoal production has been identified as one of the main sources for deforestation in Africa (Müller et al. 2011). Using more efficient methods to produce charcoal has the potential to save about 100 MtCO_2 per year in Sub-Saharan Africa, and has a wide range of ancillary benefits, not least reduced deforestation (Perspectives 2011). The mitigation potential could be realized at very low cost: Müller et al. estimate less than EUR 1/tCO_2e (Müller et al. 2011). However, due to high barriers under the current CDM provisions (e.g AM0041, AMS-III.K), no project activities targeting charcoal have as yet been implemented. Perspectives (2011) lists "among others the high transaction costs, complex requirements of project specific data, as well as difficulties to demonstrate additionality under the exisiting procedures" (Perspectives 2011) as barriers for implementation.

Following the above mentioned study commissioned by DFID, Perspectives GmbH has submitted a proposal for a standardized baseline in this sector, which has recently passed initial assessment by the secretariat (PSB-001). They argue that in most cases, charcoal production is based upon very similar technologies, while consumers are almost invariably households and very seldom small and medium enterprises which would make a standardization fairly easy. Perspectives proposes to use traditional earth kilns as the baseline technology, as these constitute the overwhelming majority in a wide range of southern and eastern African countries. The baseline would only count emission reductions from improved kilns, while further reductions e.g. from reduced deforestations are not counted. This would contribute significantly to the conservativenes of the baseline. All in all, the authors assume "that an additional 30% decrease of carbon stock occurs beyond the wood determined to be from non-renewable sources which is used in the production of charcoal" (Perspectives 2011).

Brick kilns

Throughout the world, the demand for fired clay construction bricks is rapidly rising. A wide range of brick production technologies are employed in different countries. However, hand-operated small-scale kilns constitute the most widely used method in developing countries. More efficient kilns and a change in clay mixture could reduce the amount of fuel per brick by over 50%, as Müller et al. (2011) estimated. Current methodologies targeting the brick manufacturing industries (e.g. AMS-III.Z) do not employ standardized approaches.

Müller et al. propose that a standardized baseline for clay brick production could follow the formula of tonnes of emissions per tonne of brick produced. Data needs would include quantity and carbon content of the fuel for the kiln, and the fraction of non-renewable biomass. Baselines would have to be adjusted according to materials used and types of brick produced. Using this basic data and adjusting it accordingly would allow for deriving standardized baselines at least on the country or regional level (Müller et al. 2011).

Water purification

Water purification in Least Developed Countries is mostly done by boiling water, which is costly, time-intensive and restricted to the largest obtainable container (Müller et al. 2011). Instead, chlorination, solar disinfection, ceramic filtration or other filtration, and disinfection can be employed to purify drinking water on a small-scale basis.
Currently, the applicable methodology (AMS-I.E) relies on water-boiling by participating families to purify water for the determination of a baseline. However, it cannot be ascertained that especially poor families actually do boil their water, making baseline-setting a difficult and potentially questionable process.

Müller et al. (2011) propose that instead of using fuel as baseline, the baseline could be expressed as a suppressed demand baseline, where the baseline would be counted in $tCO_2eq.$ per litre of purified water, and capped at 7.5 litres per capita and day as per WHO minimum recommendations (Müller et al. 2011). The authors' proposal has recently been merged with the existing methodology on water purification systems (AMS-III.AV), which now uses representative sampling methods, referenced literature basis or default values for the establishment of the water boiling baseline.

Transport

The transport sector is responsible for the second largest fraction of greenhouse gas emissions worldwide. The transport sector comprises multiple sub-sectors, such as passenger and freight transport, various transport systems and infrastructures, whose relations can be local, regional, national or global. Current CDM methodologies (e.g AMS-III-AA, AMS.III-U, AM0031, ACM0016) all target the local level. The sector is significantly under-represented in the CDM, mainly due to its very complex environment and the many small emission sources. The difficulty to define a system boundary makes the establishment of a baseline very challenging. Transport business-as-usual activities and trends in their development vary widely depending on geographic areas and national circumstances. Standardizing baselines should therefore necessarily be limited in their scope and outreach (Eichhorst et al. 2010).

One very promising alley for emission reductions is the construction of bus rapid transit systems (BRT). BRT can achieve reductions through several factors, including modal shift (less private vehicle use through improved public transport), Construction of segregated busways (less emissions due to stop-and-go traffic), replacement of small buses by less but larger vehicles (less emissions per person kilometer), improved vehicle technology (reduced emissions through higher efficiency), and GPS-controlled fleet management (optimisation of demand and supply (ibid.).Especially in city sprawls typical for LDCs with far outlying residential areas and dense city centres, a BRT system can be highly beneficial.

Eichorst et al. (2010) propose to use the ASIF framework (Schipper et al. 2010) as a point of departure for standardizable parameters, including total transport activity, modal structure, energy intensity of the modes, and carbon content of the fuels. They find that fuel efficiency of different modes and carbon content of fuels, default parameters derived from literature can be used, whereas the other two parameters would generally still need to be assessed on a project or at least localized (city) basis (Eichhorst et al. 2010).

Examples of other project activities under consideration

Water desalination: According to Müller et al. (2011), the potential scale of mobilization for this project activity is unknown, but it seems unlikely that the contribution of CER revenues is sufficient for such a project to be economically viable. They conclude that this project type is not wholly suited for CDM project activities. It could however be addressed in the narrower scope of water purification measures (Müller et al. 2011).

Biodiesel production: As emissions from project activities on biofuels are very location specific, a standardized approach is very challenging to implement. Müller et al. (2011) are especially concerned about the sustainability of such project if a standardized approach were taken.

Rice cultivation: In the practitioner's workshop on CDM standards in June 2011, Future camp proposed a standardized method in addition to the existing methodology (AMS-III.AU) to derive baseline methane emissions from rice fields using a field study with reference rice fields. Using this method would lead to decreased cost in determining baseline emissions of rice fields. However, project emissions would still need to be measured on a by-case basis (Nickel 2011).

Clinker production for the cement sector: In July 2012, Ethiopia has submitted a proposal for a standardized baseline, which is currently under initial assessment. This standardized baseline would apply to a large-scale project activity and is limited for use in Ethiopia only. It uses positive lists of fuels/ feedstocks and technologies in order to demonstrate additionality according to the fast start thresholds approved by the CDM Executive Board. The same positive lists are also employed to determine the baseline itself. As Ethiopia is an underrepresented country in the CDM, they have not submitted an assessment report on the data used. If adopted, the proposed SBL would replace the additionality, baseline identification and baseline emission sections of methodologies ACM0015 and ACM003.

3 STANDARDIZED BASELINE DEVELOPERS

Standardized baselines, once in place, have the potential to greatly simplify project development, as they avoid repetition of efforts in data collection and calculations for the targeted project activities (Marr 2012b). However, the development of an SBL up front is a time-consuming, data- and labour intensive process, which bears the question of who will be able to fulfil that task. Decision 3/CMP.6 allows for both top-down and bottom-up approaches for the development of SBLS, meaning that SBLs can both be developed by the Methodologies Panel of CDM Executive Board, or suggested by any relevant actors in the CDM project development process through the respective DNAs. Once approved by the Executive Board, they are made public and may be used or modified by other Parties within the sectoral or geographical scope of the SBL.

UNFCCC Secretariat for the CDM Executive Board

As part of the work programme for implementation of standardized baselines, the secretariat has developed a proposal for a data base on cost and efficiency of technologies, which was suggested to the Executive Board at its 68th meeting. The data base is geared towards helping project developers establish positive lists of technologies by providing data on the carbon intensity and cost of technologies. Positive lists are mainly used for simplified additionality testing, but may also prove helpful in the development of standardized baselines for LDCs by providing necessary information on technology options for various project activities. Current priority sectors include cement, steel making using the arc furnace route, cook stoves, and renewable energy (UNFCCC Secretariat 2012b).

It bears to be noted that this data base is currently still in a conceptual phase. The initial proposal of the secretariat has been reviewed by the Board, and a work plan for 2013 on the data base will be presented at a future EB meeting. The EB has requested that the work shall be conducted sector by sector. As the Secretariat is already heavily strained with work, it may be expected that the development of the data base will take quite some time before it is operational. Developers seeking data for a standardized baseline will therefore have to look elsewhere for the foreseeable future, as substantive work on the development of the database is only planned to start in 2013 (CDM EB 2012d).

Concerning the top-down approach to develop standardized baselines, no conclusive steps have been taken as yet. This may in part be due to the workload the CDM Executive Board, the Methodologies Panel and the Secretariat are facing, leading to very long development times. It is therefore inconclusive if these authorities will present a top-down approach in the near term.

Designated National Authorities
As discussed above, the development of a standardized baseline requires extensive data in order to calculate the necessary threshold and default factors used for the baselines. This data is often not readily available in the quality needed, especially in Least Developed Countries, making time- and cost-intensive studies necessary. At the same time, DNAs in LDCs often lack financial and technical resources to conduct studies at the needed scale (Batsuuri 2012).

While funding can be obtained via the UNFCCC for assessment reports in countries with few CDM projects (see section 1), the funds provided would be much too low. It has been estimated that the development of a standardized approach would even cost about EUR 200.000 - 500.000, if the data already exists.Gathering the appropriate data would likely result in much higher cost (Hayashi et al. 2010). Acquiring these levels of finance may be prohibitive for DNAs with limited capacity. As baselines would have to be updated at regular intervals, DNAs would have to face follow-up costs for further data monitoring.

Furthermore, the current set-up of the development of SBLs lays a heavy burden on the DNAs with the *guidelines for quality assurance and quality control.* It has been argued that the necessity to monitor data quality in the needed depth by the DNAs may lead to a decrease of proposed SBLs. As the DNAs have to approve SBLs before they can be proposed by third parties, they may hesitate to give approval in case they may overstrain their capacities in data quality control (Blodgett 2012).

Project Proponents
Given the high cost of SBL development, it seems unlikely that project proponents will undertake such an endeavour without any further incentive. Especially for small-scale projects, where profits are often lower than in lage-scale installations, an upfront investment of such a scale will not seem attractive to project proponents. Adding that the proposed SBL may not be approved right away, prolonging the process until the SBL can be used, may seem an uncalculable risk to many project proponents. This may be aggravated by the current uncertainties concerning the future of the carbon markets (Project Developer Forum 2011), and the fact that an approved standardized baseline enters the public domain, making further commercialization challenging.

Others
Decision 3/CMP.6 allows a range of other actors to develop stadardized baselines, as long as they are submitted via the relevant DNA. Actors may include, for example, donor countries, the development banks, industry associations, researchers, and foundations. Generally, the aim of the development of baselines by these actors will not be aimed at commercializing pro-

jects, but rather driving the CDM process forward, or to contribute to sustainable development in countries where the CDM is underrepresented.

The study by Müller et al. (2011) is an example: It was conducted by four research institutes and consulting firms that had no direct incentive to develop a project with the proposed new methods. The funding was obtained from the British Department for International Development in order to "enable a much larger participation in the CDM by currently underrepresented sectors and countries, especially LDCs" (Müller et al. 2011). The funding required for this extensive pilot study would have likely overstretched the budget of the countries it targets. The SBLs resulting from this project are among the very few that so far have been submitted for approval by the CDM Executive Board.

4 CONCLUSIONS

Standardized baselines yield a high potential to streamline the CDM process, and to make it more accessible to countries currently underrepresented in the CDM. SBLs are expected to be more efficient, more equitable and show greater environmental effectiveness than the current project-by-project approach. Once they are implemented, they can greatly reduce the cost of project development, as no further data collection for baseline development is needed.

Following the decisions by the UNFCCC Conference of the Parties, the procedural groundwork for the development and submission of SBLs has been laid out by the CDM Executive Board. Through the adoption of voluntary guidelines and a procedure for the submission of SBLs, the Board has given guidance on a broad area of issues in the development of SBLs. It may be said, though, that especially the *guidelines on quality assurance and quality control* lay a heavy burden on DNAs, which may pose a problem for DNAs with limited capacity in LDCs.

Standardized baselines can be especially useful for project activitiesthat show a certain homogeneity and are comparable across countries or regions. They can be downscaled in scope if different regions or countries show strong differences in technologies or measures employed in the baseline case. It is possible to aggregate SBLs to be applicable to a higher regional scope, but this may lead to significant under-crediting in certain cases in order to ensure environmental integrity. SBLs may be especially applicable to project types represen-ted by many dispersed small-scale activities, making them especially suited for CDM projects in LDCs. Further research especially targeted at LDCs is needed to ascertain this notion.

A number of project activities are exemplified in this study:

- Efficient lighting, for which two standardized small scale activities are available,
- Rural electrification, for which a new baseline methodology is awaiting approval,
- Cook stoves, which have a high mitigation potential, but for which SBLs have to take into account geographical scope and varying technologies,
- Charcoal, which has high mitigation potential in Africa, and for which also an SBL methodology has recently been submitted,
- Brick kilns, for which SBLs based on quantities of bricks produced are possible if adjusted to country or regional values,
- Water purification, for which a new SBL development methodology has recently been merged with an existing one,
- Transport, which is a promising but difficult sector for SBLs, as in interacts with very complex environments, thus leading to very localized approaches for SBLs,
- Others, including water desalination, biodiesel production, rice cultivation, and clinker production.

However, standardized baselines can be extremely costly to develop, especially if needed data is not obtainable in the desired quality in the countries or regions it targets. SBLs may be developed either top-down or bottom-up, but due to time and cost constraints, neither process has yet led to an increased development of SBLs. Some steps have been taken by the CDM Executive Board, but it will still take considerable time until they are implemented.

The development process, as envisaged right now, lays a heavy burden on countries' Designated National Authorities. Not only are they set as the main authorities in the development of SBLs, and need to approve proposed SBLs that target their country, but they also have the duty to control the quality of the data used for the proposal. As they often only have limited financial and technical capacities, it is unlikely that DNAs will develop many SBLs under the current conditions.

Project proponents face similar challenges in data and financing needs for SBL development, which makes development highly unattractive. This is worsened by the fact that an approved methodology for standardized baseline development will enter the public domain, so a developer cannot further commercialize the SBL itself.

As the development process is highly cost- and data-intensive, it is currently not very attractive to develop SBLs for commercial purposes. As a result, the very few proposed methodologies have mainly been financed by donors as a way to further develop the CDM process.

Therefore, more financing is urgently needed. While it has been proposed that the current surplus accrued by the CDM EB could be used especially for the development of standardized approaches (Hayashi 2010), it seems unlikely that the amount will suffice to sustainably support SBL development at scale.

A way forward may be a revolving fund in which Parties and other donors as well as project developers would spend a certain amount of seed finance. SBL developers could use the money to cofinance baseline development for a certain project activity. Projects using this baseline would reinvest a share of their revenues into the revolving fund, replenishing the fund for the next developer. Using such a fund, the financial risk of SBL development could be spread over a wider audience, making the development of SBLs more attractive, and easier to reap their benefits.

Standardized baselines can potentially transform the CDM into a faster, more environmentally friendly and equitable mechanism that contributes to sustainable, low-carbon development in Least Developed Countries, where mitigation efforts have so far been deemed highly challenging. But without some upfront investment, this is not likely to happen.

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CDM in African LDCs - The Project

The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) has commissioned Wuppertal Institute and GFA Envest a research project on suitable supporting activities that contribute to the enhancement of CDM in sub-Saharan African least developed countries. The main aim of the research is to assist BMU in developing its strategy for climate change mitigation activities on the African continent.

The results and findings of the research project will be published and circulated to all project developers, political decision makers, companies, financial institutions and everyone else interested in finding ways of how to best approach the CDM in Africa.

More information on the project, all publications and further resources can be found at www.jiko-bmu.de/996

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