Assessment report for CDM proposed standardized baseline (Version 01.0)

*(To be **used** by the **UNFCCC secretariat** in assessing the quality of a proposed standardized baseline only when requested by eligible DNAs.)*

Title of proposed standardized baseline:	New standardised baseline for charcoal projects in the clean development mechanism
Reference of proposed standardized baseline:	PSB-0001
Sector:	Production of charcoal supplied to households/communities/small and medium enterprises (SMEs)
Name of DNA:	Uganda
Dates Reviewed:	First submission was received on July 2, 2012 First assessment was finalized on July 15, 2012

Summary of Proposed Standardized Baseline:

Scope and application of the proposed standardized baseline (SB):

The proposed SB is submitted for a single Host Country, Uganda, and is developed for the purpose of:

- Additionality demonstration of CDM projects;
- Baseline identification; and
- Baseline emission estimation.

The sector to which this proposed SB applies is the production of charcoal supplied to households/communities/small and medium enterprises (SMEs), and applies to the following three measures:

- Fuel and feedstock switch;
- Switch of technology with or without change of energy source (including energy efficiency improvement); and
- Methane destruction.

The SB is developed by the Perspectives GmbH on behalf of Designated National Authority (DNA) of Uganda.

Description of the proposed SB:

The key data parameters related to this proposed standardized baselines are:

- Technology and yield used for charcoal production;
- Fuel use for Charcoal production;
- Methane emissions from charcoal production technologies.

The data for the above parameters were collected from secondary data sources i.e. international peer reviewed publications, reports of multilateral agencies etc.

The 'Consolidated GHG database for the charcoal sector' has been prepared and submitted with this SB.

Summary of Assessment:

Assessment process:

The assessment consisted of the following:

1. Initial document review and findings;
2. Review of the submission based on initial findings;
3. Resolution of clarifications sought;
4. Issue of the final assessment report.

A review was performed on the following data/information submitted as part of the proposed standardized baseline.

First submission dated 08/05/2012

- Proposed standardized baseline (F-CDM-PSB) dated May 8, 2012;
- Proposed new standardized baselines for charcoal projects dated December 2011;
- Spreadsheet of aggregated data (Consolidated GHG database for the charcoal sector);

The initial findings and observations were communicated to the DNA as on 27/06/2012, in response to which the DNA has submitted the clarification on 02/07/2013. Based on the clarification provided by DNA, the assessment report is finalized.

Assessment findings and resolution:

The following findings were identified by the secretariat and the responses of DNA (SB developer) are summarized in Appendix 1.

Requirements	Explanation
The data quality was checked before/during/or after data collection:	Data quality has been checked during the data collection.
(a) QC system (resource/procedure) was implemented.	The data used is taken from the secondary data sources; which are reviewed and therefore QC system as mentioned in 'Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines' is followed.
(b) QC activities was clearly documented (e.g. QC report).	The data is collected from secondary sources which is available in web with clear references. No QC report has been produced/submitted with this SB.
Were all required documents and data available for assessment?	All the data is easily available and accessible for assessment.
The proposed standardized baselines were established through consultation processes:	The primary data has not been used for the SB and therefore no consultation has been done for this SB.
(a) The sector or data providers were engaged and communicated enough to provide valid inputs/data.	
(b) Stakeholders were invited to provide inputs and comments where applicable.	
(c) The public consultation report was clearly documented if applicable.	
The data quality objectives and the general	The data quality objectives and QA/QC guidelines were

provisions of the QA/QC Guidelines were met. If the QC report is available, this session can be skipped unless further explanation is needed (when conservative approaches were taken, further explanation is required):	met as explained below:
(a) Relevant data were used to the establishment of sector-specific standardized baselines.	The key parameter collected is the charcoal yield and methane generation for a specific set of charcoal making technologies; although the data is collected for different countries, it is relevant to Uganda for the following reasons: **(1) Technologies used:** The activity data collected is only for the traditional unimproved charcoal making technologies which are the same as those producing over 90% of the charcoal used by households and SME in Uganda. **(2) Operators** (level of skills; socio-economic conditions): The activity data collected in different countries is only for the informal charcoal sector. **(3) Location of data sources with regard to climatic/ecological areas**: - The data used stems from different climatic and ecologic areas. Most of the data collected are either from areas which are either (i) Tropical (classification: Af; Am; Aw); (ii) Dry arid/ semiarid (classification: Bwh; Bwk), (iii) Humid subtropical (classification: Cwa) or (iv) Temperate highland climate with dry winters (classification: Cwb). This is adequate considering that Uganda is a country with different climate zones and a range of different ecologic areas located these climates. In accordance with the WWF "Terrestrial Ecoregions Database, at least seven ecoregions are found in Uganda. The only meaningful difference with regard to the relevance of the data for a specific region would be the carbon content in the wood used. This point has been treated in an appropriate and conservative manner. **(4) Inputs used:** All publications used provided data for charcoal produced from wood. Over 90% of the charcoal produced by the informal charcoal sector on the basis of unimproved technologies in Uganda is produced from wood. Differences in wood carbon content have been overcome by the use of a conservative default value. The above justification was provided in response to the request for clarification raised by the secretariat (See CL-01 in Appendix-1). Based on the above justification from SB developers this can be concluded that the relevant data is used in SB.

(b) The data scope was comprehensive enough to produce “true and fair” representative standardized baselines in the particular sector.	The completeness of the data is ensured by applying a clear procedure (explained in steps below) with the aim of only capturing data and information which would be “true and fair” with regard to emissions associated with the production of unsustainable charcoal from the informal sector. **Step 1: Selection of the scope of data to be collected** The scope of data which can be included has been assessed. The main conclusions are as follows: (i) Currency: No autonomous improvement in the technology /practices used by producers from the informal sector has been observed. In turn, the data to be collected form the numerical basis of the SB is not limited in time. The technologies used in the past many years are still being used for charcoal productions. (ii) Geographic scope: The performance tests are representative of the conditions found for most LDCs and LICs. The gravimetric yield tests in charcoal productions have either been performed in any LDC/LIC or have been performed in a climate representative of LDCs/LICs. **Step 2: Research and collection of data** The following rules apply: (i) The research of data/publication has been performed on the basis of internet search engines; (ii) The search for data/publications has tried to be as exhaustive as possible; (iii) All relevant publications found have been taken into account in a non-discriminatory manner. (iv) In order to limit the collection effort/cost, publication only available in paper version (not available in digitalized versions) have not been included – with the exception of paper-only publications graciously provided by the Stockholm Environmental Institute. **Step 3: Selection of data to be considered** In an effort to ensure completeness, the publications found have only been rejected on the following basis: (i) Quality issue (e.g. unrealistic values); This was only the case for one publication (Kimaryo, 1983) (ii) Lack of completeness to process the values: a. Lack of information to derive the yield on an oven dry basis (in case no indication is provided on whether the yield is expressed on an oven-dry basis or on the moisture content of the wood used); b. Lack of information with regard to the number of trials performed; **Step 4: Handling of missing data** For missing data, the following applies:

	(i) Moisture content in the wood: due to the large uncertainties, publications lacking any information on the moisture content of the wood processed are not taken into account; (ii) Carbon content in wood: As the carbon content in wood is not always known but remains in a certain range, a default value has been selected. (iii) Specific parameters on the treatment of carbon products other than charcoal: only a few publications have extensively documented the mass balance for products of the carbonization reaction other than charcoal. In order to overcome this incompleteness, the average of publications for which this information is available is used. This is accurate as publications with the most accurate and detailed carbon balance are also the most rigorous. (iv) Carbon content in charcoal: not all publications used have documented the carbon content in the charcoal produced. In order to overcome this incompleteness, the average used in the SB relies on an average of the values available. (v) Methane emission factor: only two publications which have documented the methane emissions associated with the pyrolysis process in traditional technologies have been found. In order to overcome this incompleteness, the average used in the SB relies on an average of the values available. The above justification was provided in response to the request for clarification raised by the secretariat (See CL-01 in Appendix-1). Considering the above explanation from SB developers it can be concluded that the data used in SB is complete.
(c) The key data and information are consistently presented.	Overall, the sources used exhibit a broad range of values for the charcoal yield (calculated on an oven dry basis). The reported yields ranged from 0.03 (expressed in kg charcoal per kg wood) to 0.37 with most values reported to be between 0.10 and 0.30. In an effort to ensure the consistency of the SB, the following has been applied: a. Trials for which very low yields have been observed have been excluded. b. Trials with high yields have been found to be not out of the range of what is realistically achievable therefore these data have been excluded. The above justification was provided in response to the request for clarification raised by the secretariat (See CL-01 in Appendix-1). Based on the explanation from SB developers it can be concluded that the procedure is followed to check the consistency of the data used in SB.

(d) The credibility of the data sources was ensured.	- All of the sources used to derive the values predate the drafting of the proposed new standardized baseline. As such these sources cannot possibly have been influenced by the developers of the SB. - All of the sources are documented in a clear and transparent manner with the aim of providing the reviewer the possibility to compare the source and the values and information provided in the "consolidated GHG database for the informal charcoal sector". - Most of the data sources have been drafted/supervised by international institutions / agencies like (i) international development institutions, (ii) universities in developed or developing countries, (iii) multilateral agencies, especially UN agencies, (iv) research institutes, (v) ministries or agencies of national governments. The above justification was provided in response to the request for clarification raised by the secretariat (See CL-01 in Appendix-1). Based on the above explanation from SB developers it can be concluded that the data used in SB is credible.
(e) The most recent available data were utilized. If applicable, the pre-determined data vintage was met.	Data sources used reflect the data of recent years (2010 etc.) which can be considered current and therefore the dataset meets the quality objective of currentness. Moreover based on the data collected it is clear that no changes in the technologies observed in in past many years for charcoal production. The above justification was provided in response to the request for clarification raised by the secretariat (See CL-01 in Appendix-1). Based on the above justification from SB developers this can be concluded that the most recent available data is used in SB.
(f) Duplications and errors were avoided or corrected.	The principle of the accuracy (avoidance of duplication and errors) is demonstrated by following examples: (i) Only trials for which the wood moisture content was known have been used. This is the main reason why only 93 performance trials (performance tests) out of the 257 have been use in the calculation of the average. (ii) Duplicates of values and reports have been avoided. In analyzing the literature, the following rule has been applied: whenever possible, primary sources of literature have been used. Secondary sources of literatures (values from one publication reported in another) which could not be traced back to the primary source have clearly been avoided. (iii) The use of a robust global average based on a total of 93 trials ensures the accuracy of the value used. The influence of specific circumstances resulting from local parameters (season; wood moisture content; type of wood; kiln size and shape; experience of the operator; etc.) is greatly

	reduced, especially when compared to singular situations (single performance test; all test at a single location; all tests performed by a single operator; etc.). The above justification was provided in response to the request for clarification raised by the secretariat (See CL-01 in Appendix-1). With the above explanation from SB developers it can be concluded that the accuracy of the data is justified.
(g) If any, assumptions or interpretations for data processing/ calculations were justifiable.	Justification on assumptions or interpretations for data processing and calculation is as follows, based on the fact that several assumptions were made on conservativeness of approaches and parameters used in the development of SB. **1. Conservativeness of the approach used to quantify the carbon emitted** The most important parameter in estimating the carbon emissions associated with the production of unsustainable charcoal is the yield of charcoal (mass of charcoal per mass of wood). This value is determined as an average instead of a more conservative approach. This is justified by considering the following elements: **(i) Wood to charcoal yield** Approach: The selected approach is the calculation of an average; This is accurate as a very large number of values (in total 93 carbonization tests) have been used. Values used: The values used are either representative of the operating conditions of charcoal maker in the informal sector or are more conservative. More conservative values are for example obtained when a higher yield is achieved due to improved operating conditions (wood specially dried for the test; use of only most skilled charcoal makers to perform the tests, etc.). **2. Conservativeness of the carbon content in wood used** The proposed standardized wood carbon content used in this SB is set at 45%. In reality, a wide variety of wood are likely to be used with a carbon content ranging from 43% to over 50% (on a dry mass basis). As a comparison, Chidumayo indicates a carbon content in wood of 47% in miombo woodlands and 44% in Savannah woodlands (Chidumayo, 1994). The IPCC in its “2006 IPCC Guidelines for National Greenhouse Gas Inventories” table 12.4 “Default factors to convert from product units to carbon” suggests a wood carbon content of 50% (IPCC, 2006). The above justification was provided in response to the request for clarification raised by the secretariat (See CL-02 in Appendix-1). Based on the above justification from SB developers this can be concluded that the assumptions or interpretations for data processing/ calculations used in SB are justifiable.

(h) The security of datasets including confidentiality was well maintained in accordance with pre-established procedures if requested.	The excel sheet database is prepared for the data. The sources of the data is explained in the excel sheet and that can be reproduced. The above justification was provided in response to the request for clarification raised by the secretariat (See CL-03 in Appendix-1). Based on the above justification from SB developers this can be concluded that the security of database is maintained.
The assessment is concluded successfully, based on the overall evaluation.	The data used for development of SB is meeting the data quality objectives and general provisions of 'Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines'.
Date the assessment is sent to the focal point:	

Appendix 1. Findings and resolution

<table>
<tr><th>CL No.</th><th>Request for clarification</th><th>Reference to:</th><th>Responses and corrective actions of DNA</th><th>Conclusion</th></tr>
<tr><td>1</td><td>It has been assessed that the activity data presented in the submission is based on the international publications applicable to different countries, different locations under different circumstances. It is requested to clarify criteria that have been adopted to evaluate the credibility, accuracy and completeness of data collected through these publications and its relevance to Uganda. Kindly cover several examples from the submission to demonstrate your response. For example, you may like to consider that demonstration of credibility of publication can be done by the fact that they are peer reviewed.</td><td>Relevance, credibility, accuracy and completeness</td><td>Credibility of the sources used
- All of the sources used to derive the values predate the drafting of the proposed new standardized baseline (PSB). As such these sources cannot possibly have been influenced by the proponent of the PSB.
- All of the sources are documented in a clear and transparent manner with the aim of providing the reviewer the possibility to compare the source and the values and information provided in the “consolidated GHG database for the informal charcoal sector“.
- A short review of the sources used shows them to be highly trustworthy based on the stakeholders involved. This is illustrated in the table below shows a short analysis of the first five publications selected according to their date of publication (from the oldest to the most recent).
<table><tr><th>Report</th><th>Report</th></tr><tr><td>Wartluft, Jeffrey; White, Stedford (1983) Team Compares Charcoal Production Methods, VITA News, October 1983, pp.8-11, Comparing Simple Charcoal Production Technologies for the Caribbean, Arlington, Virginia</td><td>MONTSERRAT FUELWOOD/CHARCOAL/COOKSTOVE PROJECT
A cooperative effort by the
1) GOVERNMENT OF MONTSERRAT, MINISTRY OF AGRICULTURE (GOM)
2) CARIBBEAN DEVELOPMENT BANK (CDB)
3) VOLUNTEERS IN TECHNICAL ASSISTANCE (VITA) and
4) UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)</td></tr></table></td><td>Based on the explanation provided it can be confirmed that the data used in SB development is meeting the objectives of relevance, credibility, accuracy and completeness as mentioned in ’ Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines’.</td></tr>
</table>

CL No.	Request for clarification	Reference to:	Responses and corrective actions of DNA		Conclusion
			Karch, G. Edward; Boutette, Michael; Christophersen, Kjeil (1987): The Casamance Kiln	1) Energy Development International and The University Of Idaho, College of Forestry, Wildlife and Range Sciences, Moscow, Idaho 2) Energy Initiatives for Africa (EIA) USAID/AFR/RA Freed No. 698-0424	
			Kimaryo, B.T. (1983): Yield and quality of charcoal from lesser known tree species of Tanzania, Timber Utilization Research Centre, Moshi, Tanzania	1) IDRC: The International Development Research Centre (IDRC) is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in five sectors: agriculture, food and nutrition sciences; health sciences; information sciences; social sciences; and communications. IDRC is financed solely by the Government of Canada; its policies, however, are set by an international Board of Governors. 2) Timber Utilization Research Centre, Moshi, Tanzania	
			Kimaryo, B.T.; Ngereza, K.I (1989): Charcoal production in Tanzania using improved traditional earth kilns, Wood Energy Section, Tanzania Forestry Research Institute, Timber Utilization Research Centre, Moshi, Tanzania	1) IDRC 2) Wood Energy Section, Tanzania Forestry Research Institute, Timber Utilization Research Centre, Moshi, Tanzania	
			ESMAP (1988): Joint UNDP/World	The Program is a major international effort	

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Bank Energy Sector Managements Assistance Program, Activity completion report, Jamaica charcoal production project.	supported by the UNDP, the World Bank, and bilateral agencies in a number of countries including the Netherlands, Canada, Switzerland, Norway, Sweden, Italy, Australia, Denmark, France, Finland, the United Kingdom, Ireland, Japan, New Zealand, Iceland, and the USA

The result of the analysis shows that all papers used show that the entities involved in drafting or supervising the writing of the papers are (i) international development institutions, (ii) universities in developed or developing countries, (iii) multilateral agencies, especially UN agencies, (iv) research institutes, (v) ministries or agencies of national governments.

Accuracy:

The SBL proponent applied accuracy principles in line with those found in the "D*raft guideline for quality assurance and quality control of the data used in the establishment of the standardized baseline*":
"Accuracy - reduce errors and uncertainties as far as is practical and cost-effective. The QC procedures should be well-designed to ensure the accuracy, which should focus on the procedures to avoid potential duplications and errors".

(i) Only trials for which the wood moisture content was known have been used. Assumptions on the wood moisture content cannot be made as the range of uncertainty is too large. This is the main reason why only 93 performance trials (performance tests) out of the 257 have been use in the calculation of the global average;

(ii) Reliability of the individual yield values found: Overall, the sources used exhibit a broad range of values for the charcoal yield (calculated on an oven dry basis). The yields reported ranged from 0.03 (expressed in kg charcoal per kg wood) to 0.37 with most values reported to be between 0.10 and 0.30. In an effort to ensure the accuracy of the standardized baseline, the following has been applied:

a. Trials for which very low yields have been observed have been excluded. This is for example the case for Kimaryo (1983). The yields of 0.03 and 0.07 have been found to be clearly out of the range of values generally observed. The inclusion of

CL No.	Request for clarification	Reference to:	Responses and corrective actions of DNA	Conclusion
			low yield values in the global average would otherwise increase the amount of carbon emissions associated with unsustainable charcoal and lead to an overestimation of the baseline. This exclusion is therefore conservative; b. Trials with high yields have been found to be not out of the range of what is realistically achievable (for example, the Adam kiln claims a yield of up to 0.42). None of the high yield values found in the data have therefore been excluded. This is conservative as higher yield values would underestimate the carbon emissions associated with the production of unsustainable charcoal and lead to an underestimation of the baseline; c. Insufficiently documented trials: Overall, the performance trials have been found to be rigorously documented. Only one performance test (Aus der Beek, 2006) might not meet the required standard with regard to the completeness/transparency of the values provided. For the treatment of this publication, please refer to "Item 3" of this document; (iii) Duplicates of values and reports have been avoided. In analyzing the literature, the following rule has been applied: whenever possible, primary sources of literature have been used. Secondary sources of literatures (values from one publication reported in another) which could not be traced back to the primary source have clearly been avoided; (iv) The use of a robust global average based on a total of 93 trials ensures the accuracy of the value used: a. The influence of specific circumstances resulting from local parameters (season; wood moisture content; type of wood; kiln size and shape; experience of the operator; etc.) is greatly reduced, especially when compared to singular situations (single performance test; all test at a single location; all tests performed by a single operator; etc.); b. Compared to the project-based approach, the use of a broad range of values greatly avoids possible gaming. For example, only one publication with adequate tests for Uganda has been found (Nturanabo, 2010) in the literature. If the sole values found for Uganda are taken into account, the considered average yield would be 0.156. This value would be less conservative than the global average used.	

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			Completeness of the data collected The SBL proponent applied completeness principles in line with those found in the "D*raft guideline for quality assurance and quality control of the data used in the establishment of the standardized baseline*": *"Completeness - include all relevant activity data and information to produce "true and fair" representative standardized baselines in a sector. It requires procedures to avoid, identify and handle missing data (e.g. relevant companies that have been excluded or incomplete data entry);"* This has been dealt with by applying a clear procedure with the aim of only capturing data and information which would be "true and fair" with regard to emissions associated with the production of unsustainable charcoal from the informal sector. ***Step 1: Selection of the scope of data to be collected*** The scope of data which can be included has been assessed. The main conclusions are as follows: (i) Currency: No autonomous improvement in the technology/practices used by producers from the informal sector has been observed. In turn, the data to be collected to form the numerical basis of the SBL is not limited in time. This is clearly demonstrated in chapter 6.9 from the proposal; (ii) Geographic scope: The performance tests are representative of the conditions found for most LDCs and LICs. The tests have either been performed in any LDC/LIC or have been performed in a climate representative of LDCs/LICs; (iii) For other elements applied to define the scope of data collected, please refer to chapter 10.2 (procedure and rules) of the document submitted along with the PSB. ***Step 2: Research and collection of data*** The following rules apply: (i) The research of data/publication has been performed on the basis of internet search engines; (ii) The search for data/publications has tried to be as exhaustive as possible;	

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			(iii) All relevant publications found have been taken into account in a non-discriminatory manner; a. Note: a relevant publication is a publication which provides at least the yield for the wood to charcoal conversion on the basis of traditional technologies); (iv) In order to limit the collection effort/cost, publication only available in paper version (not available in digitalized versions) have not been included – with the exception of paper-only publications graciously provided by the Stockholm Environmental Institute. ***Step 3: Selection of data to be considered*** In an effort to ensure completeness, the publications found have only been rejected on the following basis: (i) Quality issue (e.g. unrealistic values); This was only the case for one publication (Kimaryo, 1983). (ii) Lack of completeness to process the values: a. Lack of information to derive the yield on an oven dry basis (in case no indication is provided on whether the yield is expressed on an oven-dry basis or on the moisture content of the wood used); b. Lack of information with regard to the number of trials performed. ***Step 4: Handling of missing data*** For missing data, the following applies: (i) Moisture content in the wood: due to the large uncertainties, publications lacking any information on the moisture content of the wood processed are not taken into account; (ii) Carbon content in wood: As the carbon content in wood is not always know (whether in the performance trial connected or in possible projects using this PSB) but remains in a certain range, a default value has been selected. For more information on the conservativeness of this value, please refer to the clarification 2 of this answer to the request for clarification; (iii) Specific parameters on the treatment of carbon products other than charcoal: only a	

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			few publications have extensively documented the mass balance for products of the carbonization reaction other than charcoal. In order to overcome this incompleteness, the average of publications for which this information is available is used. This is accurate as publications with the most accurate and detailed carbon balance are also the most rigorous. (iv) Carbon content in charcoal: not all publications used have documented the carbon content in the charcoal produced. In order to overcome this incompleteness, the average used in the PSB relies on an average of the values available; (v) Methane emission factor: only two publications which have documented the methane emissions associated with the pyrolysis process in traditional technologies have been found. In order to overcome this incompleteness, the average used in the PSB relies on an average of the values available. **Relevance of the data to Uganda** The key parameter collected is the charcoal yield for a specific set of charcoal making technologies (unimproved traditional technologies). Although the data is collected for different countries, it is relevant to Uganda for the following reasons: (i) Technologies used: The activity data collected is only for the traditional unimproved charcoal making technologies which are the same as those producing over 90% of the charcoal used by households and SME in Uganda; (ii) Operators (level of skills; socio-economic conditions): The activity data collected in different countries is only for the informal charcoal sector. There is no fundamental difference between informal charcoal makers in Uganda and those in the other countries used in the PSB; (iii) Location of data sources with regard to climatic/ecological areas: - The data used stems from different climatic and ecologic areas. Most of the data collected are either from areas which are either (i) Tropical (classification: Af; Am; Aw); (ii) Dry airds/semiarid (classification: Bwh; Bwk), (iii) Humid subtropical (classification: Cwa) or (iv) Temperate highland climate with dry winters (classification: Cwb). This is adequate considering that Uganda is a country with different climate zones and a range of different ecologic areas located these climates. In accordance with the WWF "Terrestrial Ecoregions Database, at least seven ecoregions are found in Uganda. The only meaningful difference with regard to the relevance of the data for a specific	

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			region would be the wood content in the wood used. This point has been treated in an appropriate and conservative manner. (iv) Inputs used: All publications used provided data for charcoal produced from wood. Over 90% of the charcoal produced by the informal charcoal sector on the basis of unimproved technologies in Uganda is produced from wood. Differences in wood carbon content have been overcome by the use of a conservative default value.	
2	Please clarify how the conservativeness of the data used for the calculations of baseline emissions has been ensured. For example, a justification may be needed why the average value of the key data (e.g. yield of charcoal) is considered to be conservative for calculations of baseline emissions. In another example, a rationale needs to be provided for setting the value of carbon content in wood as 45% as a conservative value. Please be exhaustive while considering responding to this question.	Conservativeness	**Conservativeness of the approach used to quantify the carbon emitted** Overall, all choices made in developing this standardized baseline aim at deriving values which are either accurate (average yield based on many tests) or conservative (underestimation of changes on carbon stocks associated with the production of charcoal). The most important parameter in estimating the carbon emissions associated with the production of unsustainable charcoal is the yield of charcoal (mass of charcoal per mass of wood). This value is determined as an average instead of a more conservative approach. This is justified by considering the following elements: ***(i) Wood to charcoal yield*** - Approach: The selected approach is the calculation of an average; This is accurate as a very large number of values (in total 93 carbonization tests) have been used; - Values used: The values used are either representative of the operating conditions of charcoal maker in the informal sector or are more conservative. More conservative values are for example obtained when a higher yield is achieved due to improved operating conditions (wood specially dried for the test; use of only most skilled charcoal makers to perform the tests, etc.). A practical illustration of this can be found in the spreadsheet with the values from Hibajene, 1994. One single publication has been fully excluded (Kimaryo, 1983) on the basis that the values have been found to be not trustworthy and that this exclusion would lead to more conservative values. ***(ii) Carbon stocks considered*** - Approach: This methodology only credits emission reductions from the carbon saved in the wood which would have been used for charcoal production. This is extremely conservative for the following reasons: o The above-ground biomass from trees is larger than the quantity of wood use in	Based on the explanation provided it can be confirmed that the data used in SB development is meeting the objectives of conservativeness as mentioned in ' Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines'.

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			the production of charcoal (Typically, only stems above knee high and branches with over 2 cm in diameter are used in the production of charcoal. The associated carbon stock in small branches, leaves, the lowest part of the stem and roots represents more than 20% of the wood harvested for charcoal). In turn the emission reductions calculated with the standardized baseline are under evaluated. Reducing the consumption of unsustainable charcoal does not only avoid the emissions from the wood which would have been turned into charcoal. It also reduces emissions from the wood which would have been wasted (not turned into charcoal) when felling trees to produce charcoal. Craster Herd, 2007 puts the share of wasted wood at 2 kg for 5.7 kg of wood used in the production, equivalent to 26% losses; o Below-ground biomass: Projects using this standardized baseline lead to reduction of deforestation as fewer trees have to be cut to produce charcoal. The total carbon stock of a tree (which is cut for the production of charcoal) exceeds by at least by 20% the carbon stock of the above-ground wood. This present PSB does however not account for this carbon which would be emitted in the baseline for the production of unsustainable charcoal(With the exception of deep roots which are expected to partly fossilize). Reducing the consumption of unsustainable charcoal does not only avoid the emissions from the wood which would have been turned into charcoal. It also reduces emissions from the carbon contained in the below-ground biomass which would have been emitted after felling trees to produce charcoal. In turn the approach selected is very conservative; o Overall, methodologies which will be based on this PSB would avoids the total loss of the tree carbon stock (by avoiding the cutting of the tree) yet only credit a certain share of this tree carbon stock. As a consequence, real emission reductions are well in excess of the CERs generated. As a conservative assumption, this unaccounted for source of emission reductions can be estimated at 20% (Table 4.4 „Ratio of below-ground biomass to above-ground biomass" of the IPCC Vol. 4 on "Agriculture, Forestry and other Land Use" puts the ratio of biomass in the root system between 20% and 56% for tropical and subtropical climate systems where most of the eligible countries for this methodology are located). ***(iii) Other carbon products considered*** - Approach: The treatment of carbon products other than charcoal in the carbon balance	

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			is conservative. This is clearly documents in the chapter 10.2 "rules and procedures" of the proposed PSB. **Conservativeness of the quantification of baseline emissions** In addition to a conservative quantification of carbon emissions, methane emissions from the pyrolysis gases have in all likelihood been underestimated. This is explained in chapter 10.3 of the PSB: *The methane emission factor is calculated on the basis of Smith, 1999 and Pennise, 2001. Both sets of experiments used much drier than the normal practice and achieve a higher dry basis yield than usual. As such, methane emissions might have been strongly underestimated compared to the normal practice.* This seems to be confirmed by the fact that the registered Plantar project (UNFCCC project ID: 1053) seems to exhibit higher specific methane emissions for an more advanced technology. **Conservativeness of the carbon content in wood used** The proposed standardized wood carbon content used in this PSB is set at 45%. In reality, a wide variety of wood are likely to be used with a carbon content ranging from 43% to over 50% (on a dry mass basis). This value set at 43% is conservative as it assumes that less carbon will be emitted per mass of dry wood used for the production of charcoal than in most cases. As a comparison, Chidumayo indicates a carbon content in wood of 47% in miombo woodlands and 44% in Savannah woodlands(Chidumayo, 1994). The IPCC in its "2006 IPCC Guidelines for National Greenhouse Gas Inventories" table 12.4 "Default factors to convert from product units to carbon" suggests a wood carbon content of 50% (IPCC, 2006). This value is also lower than the values presented by Lamlom and Savdige (S.H. Lamlom, R.A. Savidge (2003), A reassessment of carbon content in wood: variation within and between 41 North American species, Biomass and Bioenergy Volume 25, Issue 4, October 2003, Pages 381–388) in their research paper.	

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3	Please clarify if any quality assurance procedure/s have been adopted for systematic identification, formulation and analysis of risks for not meeting the quality objectives of the data sets used. If yes, please elaborate.	QA procedure	**Preliminary remark:** The present standardized baseline has been submitted on March 1, 2012, before the adoption by the Executive Board of the "GUIDELINES FOR QUALITY ASSURANCE AND QUALITY CONTROL OF DATA USED IN THE ESTABLISHMENT OF STANDARDIZED BASELINES". As such this guideline adopted at EB66 will only be used as background information. **Procedures applies for meeting the quality objectives:** The following procedures have been applied: - The plausibility of the data collected and calculated items have been evaluated by comparing the data to the range of values; - A uniformed data collection form has been used; - The data does not suffer from the "currency issue" as the technology considered has been demonstrated not to improve over time; - The data collected/processed has been tracked and sources are provided in a transparent manner; - The referenced materials are available upon request; - The level of aggregation has been clearly provided; - The data processing in the submitted excel sheet is transparent and traceable; can be understood; it can also be expanded or corrected if necessary; - Requests for data correction or explanation can be submitted at any time either through the Ugandan DNA or directly to the SBL proponent (Perspectives GmbH) at: muellller@perspectives.cc - Double counting is prevented by the fact that a spreadsheet lists all sources used; - The SBL proponent is committed toward responsiveness and transparency in order to ensure that remarks/requests/suggestions are treated in an appropriate manner; - Error tolerance: the large number of trials used means that single errors in the tests or processing of the values would only lead to minor impacts in terms of possible CER	Based on the explanation provided it can be confirmed that quality assurance procedures is followed as mentioned in' Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines'.

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			generation. This impact would remain much below the share of uncredited emission reductions; - - No use of secondary sources of literature.	

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