

**ASB0032**

## Standardized baseline

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# Baseline woody biomass consumption for household cookstoves in Namibia

Version 01.0



**United Nations**  
Framework Convention on  
Climate Change

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## **1. Introduction**

### **1.1. Background**

1. This standardized baseline provides the values for baseline woody biomass consumption per person for household cookstoves to estimate emission reduction from project activities for efficient cookstoves in Namibia.

## **2. Scope, applicability, and entry into force**

### **2.1. Scope and applicability**

2. The scope of the standardized baseline covers the values of baseline woody biomass consumption per person for household cookstoves in Namibia.
3. Clean development mechanism (CDM) project activities can apply this standardized baseline under the following conditions:
  - (a) The project activity is implemented in Namibia; and
  - (b) The approved CDM methodology that is applied to the project activity is small-scale methodology AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass” and/or small-scale methodology AMS-I.E “Switch from non-renewable biomass for thermal applications by the user”; and
  - (c) The standardized values are applicable to households using only firewood and/or charcoal in the pre-project scenario as a cooking fuel; households using LPG and/or kerosene in the pre-project scenario as a cooking fuel are not eligible to apply the standardized values in this document<sup>11</sup>;and
  - (d) The standardized values are not applicable to standalone renewable energy based water treatment technologies under AMS-I.E.
4. Project participants who do not wish to use this standardized baseline may alternatively estimate their own values, by applying the latest applicable version of the methodology.

### **2.2. Entry into force and validity**

5. This standardized baseline enters into force upon adoption by the CDM Executive Board on 22 February 2017. This standardized baseline is valid from 22 February 2017 to 21 February 2020.

## **3. Normative references**

6. This standardized baseline is based on the proposed top-down standardized baseline TSB0007 “Baseline woody biomass consumption for cookstoves in Namibia”.

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<sup>11</sup> One way to demonstrate this condition is to check and record fuel use at the time of distribution of the project stove.

7. This standardized baseline is derived from small-scale methodology AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass” and small-scale methodology AMS-I.E “Switch from non-renewable biomass for thermal applications by the user”.
8. For more information regarding proposed new standardized baselines as well as their consideration by the CDM Executive Board please refer to <[http://cdm.unfccc.int/methodologies/standard\\_base/index.html](http://cdm.unfccc.int/methodologies/standard_base/index.html)>.

## 4. Definitions

9. The definitions contained in the Glossary of CDM terms shall apply.
10. The definitions contained in the latest version of AMS-II.G and AMS-I.E shall apply.
11. The standardized baseline values are expressed as:
  - (a) **Per person** values based on **woodfuel users**, i.e. relative to the residents of households that use firewood and/or charcoal as a cooking fuel in the pre-project scenario;
  - (b) **Tonnes of air-dry woody biomass equivalent** (i.e. firewood as such and wood used for the production of the charcoal).
12. The following definitions shall be applied in accordance with FAO Unified Bioenergy Terminology<sup>2</sup>.
  - (a) **Woodfuel**: "all types of biofuels originating directly or indirectly from woody biomass". In this document, firewood and wood-for-charcoal are grouped as woodfuel consumption.;
  - (b) **Charcoal**: "Solid residue derived from carbonization distillation, pyrolysis and torrefaction of fuelwood";
  - (c) **Firewood (fuelwood)**: "woodfuel where the original composition of the wood is preserved";

## 5. Parameters and values

13. This standardized baseline shall be used together with the methodologies AMS-II.G (version 08.0) and/or AMS-I.E (version 07.0)<sup>3</sup>. For the estimation of baseline emissions of project activities, the provisions in the methodology AMS-II.G version 8.0 or AMS-I.E version 7.0 for determining the values of the parameters listed in Table 1 below, do not apply. Instead, standardized values provided in the Table 1 below shall be used.

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<sup>2</sup> FAO (2004): Unified Bioenergy Terminology (UBET)

Accessed on 20 January 2017 from <http://www.fao.org/docrep/007/j4504e/j4504e00.htm>

<sup>3</sup> The standardized baseline can be used together with future versions of methodologies AMS-II.G or AMS-I.E as long as the requirements related to the parameter mentioned in Table 1 do not change.

**Table 1. Standardized values for AMS-II.G and AMS-I.E**

Parameter	Unit	Description	Applicable values	Source												
$B_{old,p}$ under AMS-II.G	tonnes/ person/ year	Annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices	<p>The following conditions apply:</p> <p>(a) Use values in the table below, according to the pre-project fuel used for cooking (i.e. firewood or charcoal) and the location of households (i.e. rural areas);</p> <p>Annual per capita consumption values [tonnes/person/year]</p> <table border="1"> <thead> <tr> <th colspan="2">Urban areas<sup>4</sup></th> <th colspan="2">Rural areas</th> </tr> <tr> <th>Firewood</th> <th>Charcoal (wood equivalent)</th> <th>Firewood</th> <th>Charcoal (wood equivalent)</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> <td>0.743</td> <td>-</td> </tr> </tbody> </table>	Urban areas <sup>4</sup>		Rural areas		Firewood	Charcoal (wood equivalent)	Firewood	Charcoal (wood equivalent)	-	-	0.743	-	See appendix
Urban areas <sup>4</sup>		Rural areas														
Firewood	Charcoal (wood equivalent)	Firewood	Charcoal (wood equivalent)													
-	-	0.743	-													
$BC_{BL,PP,y}$ under AMS-I.E	tonnes/ person/ year	Average annual consumption of woody biomass per person before the start of the project activity	(b) Use the classification included in official documents or government publications to identify urban and rural areas.													

<sup>4</sup> Values are not proposed currently for urban areas as reliable data was not found. The rationale is detailed in the appendix.

## **Appendix. Rationale and justifications for the standardized value for baseline woody biomass consumption**

### **1. Introduction**

1. This appendix provides the rationale and justification for the standardized values baseline woody biomass consumption per person in Namibia ( $B_{old,p}$  under AMS-II.G and  $BC_{BL,PP,y}$  under AMS-I.E). The relevant data quality objectives of the “Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines” have been followed while developing the proposed standardized baselines.
2. The standardized values can be used to determine the parameter  $BC_{BL,PP,y}$  under AMS-I.E (Average annual consumption of woody biomass per person before the start of the project activity) and the parameter  $B_{old,p}$  under AMS-II.G (annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device).

### **2. Standardization of baseline woody biomass consumption - Analysis**

3. According to the data from WHO and UNDP (2009)<sup>1</sup>, in rural areas of Namibia, the percentages of the rural population that use firewood and charcoal for cooking are 92.1% and 0.9% respectively. In the urban areas, electricity (65.6%) and gas (10.4%) are the main fuels used for cooking.
4. Taking into account national circumstances in Namibia, the DSB has defined a country-specific default value for baseline woodfuel consumption per person, according to the usage of fuels and the location of households (i.e. urban areas or rural areas), based on a review of literature and project design documents (PDDs) and programme design documents (PoA-DDs) available for the country.
5. The registered PDD and PoA-DD from the country as well as national studies and reports were reviewed. There is only one PoA for cookstoves in Namibia, i.e. PoA 7359. This PoA applied the methodology AMS-I.E using the option where the woody biomass consumption is calculated from the thermal energy generated in the project activity. The option based on thermal energy does not require pre project wood fuel consumption data and hence no useful information for the purpose of this standardised baseline was found in that PoA. Values in the literature are summarized in Table 1 and a detailed explanation of values reported in the literature is included in paragraphs below.
6. The sources provide the data in a variety of formats (total consumption in all sectors, tons/household-year, kg/person-day as average for whole population or for all users or for main users only, etc.). For easy comparison, all the data for firewood and for charcoal are

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<sup>1</sup> The Energy Access Situation in Developing Countries: A Review Focusing on the Least Developed Countries and Sub-Saharan Africa (New York: UNDP and WHO, 2009)

presented as woody biomass equivalent in tonnes (air-dry)/person-year<sup>2</sup>, after appropriate conversion.

**Table 1. Average annual consumption of woody biomass per person reported in literature reviewed for Namibia**

Source	remarks	Ref. year	Standardized values for main users in tonnes air-dry per capita					
			Urban areas			Rural areas		
			Annual firewood consumption	Annual charcoal consumption (wood eq.)	Annual total woodfuel (wood eq.)	Annual firewood consumption	Annual charcoal consumption (wood eq.)	Annual total woodfuel (wood eq.)
NISER 1992 [1(a)]; from H.O. Kojwang, 2000 [1]	Ovamboland	1992				0.207		
Klaeboe and Omwami, 1997 [1(b)], for Directorate of Forests from H.O. Kojwang, 2000 [1]	Windhoek	1996	0.329					
	Ovambo	1996	0.347					
	Rundu	1996	0.562					
	Weighted mean	1996	0.364					
		1996				0.420		
Wamukonya, 1997 [1(c)], for Namibia MoE. from H.O. Kojwang, 2000 [1]		1997				0.231		
Palmer and Macgregor, 2008 [2]		2004				0.743		
Macgregor et al, 2007 [3]	Oshikoto	2004				0.66		
	Ohangwena	2004				1.20		
	Oshana	2004				0.14		
	Omusati	2004				0.91		
	Average	2004				0.913		

#### References and notes:

- H.O. Kojwang. 2000. Wood Fuels review and assessment: NAMIBIA Country Report. FAO. Accessed on 20 January 2017 from <http://www.fao.org/docrep/004/X6797E/X6797E00.htm>
  - Namibia Institute for Social and Economic Research (NISER) 1992. Namibia Household Energy Assessment. University of Namibia, Windhoek, Namibia.
  - Klaeboe J and R. K. Omwami 1997. Forest Policy for Sustainable Utilisation of the Woodlands and Savannahs of Namibia. A study on Consumption Patterns of Major Wood and Wood Products in Namibia. Ministry of Environment and Tourism, Directorate of Forestry, Namibia.
  - Wamukonya L 1997. Energy Consumption Patterns of Rural and Peri-Urban Households in Namibia. Ministry of Mines and Energy Namibia, UNDP, GTZ.
- Palmer, Charles; MacGregor, James (2008): Fuelwood Scarcity, Energy Substitution and Rural Livelihoods in Namibia, Proceedings of the German Development Economics Conference, Zürich 2008, No. 32. Accessed on 20 January 2017 from [https://econstor.eu/bitstream/10419/39884/1/AEL\\_2008\\_32\\_palmer.pdf](https://econstor.eu/bitstream/10419/39884/1/AEL_2008_32_palmer.pdf)
- MacGregor, J., C. Palmer and J.I. Barnes. 2007. Forest resources and rural livelihoods in the north-central regions of Namibia. Environmental Economics Programme Discussion Paper 07-01. International Institute for Environment and Development, London. Accessed on 20 January 2017 from

<sup>2</sup> The standardized values are based on data derived in the literature for main users, therefore, the standardized values are applicable to households that use exclusively biomass (woodfuel and/or charcoal) for cooking in the pre-project scenario. Therefore, CDM project activities/PoAs may apply the standardized values for the households that use exclusively biomass in the pre-project scenario.

<http://pubs.iied.org/pdfs/15506IIED.pdf>

7. The following paragraphs provide more details of the studies listed in the table above:
8. **Study by Namibia Institute for Social and Economic Research (NISER) 1992:** This study in 1992 attempted at comprehensive woodfuel data collection at the national level. In this study, a household energy consumption survey and energy marketing and distribution was conducted. The study areas were former Ovamboland in the north and Katutura Community in Windhoek. According to this study, in rural Ovamboland, 90% use firewood for cooking, and daily per capita fuelwood consumption was 0.567 kg. Therefore, annual per capita firewood consumption is 0.207 [tonnes/person-year].
9. **Study by the Directorate of Forestry 1996 (Klaeboe J and R. K. Omwami 1997):** This major study on firewood consumption in the major urban areas was commissioned by the Directorate of Forestry in 1996. The urban areas covered in the survey included Windhoek (Katutura) and Windhoek (middle to upper income neighbourhoods), Oshakati, Ondangwa, Ongwediva, Rundu and Katima Mulilo. The main objective of the study was to collect data on the volumes and prices for six wood products and to estimate the demand for these products for 10 years. In total, 973 people were interviewed in the study, using structured questionnaires. The result of this study showed that daily per capita firewood consumption in Windhoek, Ovambo and Rundu are 0.90, 0.95 and 1.54 kg per day respectively. Therefore, annual per capita firewood consumption is 0.329, 0.347, and 0.562 [tonnes/person-year] respectively.
10. **Study by the Ministry of Energy 1997 (Wamukonya L 1997):** Another major study looked at energy consumption pattern in Namibia. The study used structured questionnaires in 7 out of the 13 political regions of Namibia. The regions covered were: Kavango, Karas, Erongo, Omaheke, Omusati, Oshana, and Oshikoto. A total of 100 households were interviewed in the whole study. From this study, it was revealed that the annual per capita firewood consumption is 0.231 [tonnes/person-year].
11. **Study by the Ministry of Environment and Tourism 2004:** Two research papers, i.e. Palmer and Macgregor (2008) and Macgregor et al (2007), use the dataset from a survey conducted by the Namibia's Ministry of Environment and Tourism (MET) in 2004. The data on household forest use were collected by the MET, in collaboration with the Institute for Environment and Development (IIED). Four main regions in the north-central regions of Namibia were targeted. The average per capita consumption of firewood reported in C. Palmer and J. Macgregor (2008) is 0.743 [tonnes/person-year], and that reported in Macgregor et al (2007) is 0.913 [tonnes/person-year].

### 3. Recommendation

12. In analysing all available data sources in the table 1, it is considered that the most reliable data source should be selected, taking into account several factors such as i) whether it is primary or secondary data, ii) what is the geographical coverage of the survey, iii) what is the vintage of the survey, iv) whether it is conservative.
13. For rural areas, with the above criteria in mind, the 2004 study by MET as cited in Palmer and Macgregor, 2008 and Macgregor et al, 2007, was considered the most reliable due to its recentness compared to other sources. The more conservative value was selected (i.e. 0.743 instead of 0.913)



14. For urban areas, due to lack of recent studies available (the most recent country specific data available for urban areas for Namibia is the study by the Directorate of Forests 1996), no standardized baseline is recommended. As mentioned earlier, electricity and gas are the main fuels used for cooking in the urban areas.
15. Based on the above analysis, the following values are recommended as standardized values for the baseline woody biomass consumption per person in Namibia
- (a) Use values in table 2 below, according to the baseline fuel (i.e. firewood or charcoal) and the location of households (i.e. rural areas);

**Table 2. Annual per capita consumption values [tonnes/person-year]**

Urban areas		Rural areas	
Firewood	Charcoal (wood equivalent)	Firewood	Charcoal (wood equivalent)
-	-	0.743	-

- (b) Use the classification included in official documents or government publications to identify urban and rural areas.

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### Document information

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