

ASB0033

Standardized baseline

Baseline woody biomass consumption for household cookstoves in Togo

Version01.0



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 Togo.

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 Togo.
3. Clean development mechanism (CDM) project activities can apply this standardized baseline under the following conditions:
 - (a) The project activity is implemented in Togo; 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 document¹¹;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 TSB0010 “Baseline woody biomass consumption for cookstoves in Togo”.

¹¹ 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>.

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. 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/or wood used for the production of the charcoal).
12. The following definitions shall be applied in accordance with FAO Unified Bioenergy Terminology².
 - (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;
 - (b) **Charcoal**: "Solid residue derived from carbonization distillation, pyrolysis and torrefaction of firewood";
 - (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)³. 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.

² FAO (2004): Unified Bioenergy Terminology (UBET)

Accessed on 23 January 2017 from <http://www.fao.org/docrep/007/j4504e/j4504e00.htm>

³ 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 location of households (i.e. regions and urban areas or rural areas);</p> <p>Annual per capita consumption values [tonnes/person/year]</p> <table><tr><th>Region</th><th>Urban area</th><th>Rural areas</th></tr><tr><td>Savanes</td><td>1.03</td><td>0.51</td></tr><tr><td>Kara</td><td>1.22</td><td>0.45</td></tr><tr><td>Centrale</td><td>1.08</td><td>0.46</td></tr><tr><td>Plateaux</td><td>1.68</td><td>0.69</td></tr><tr><td>Maritime</td><td>1.26</td><td>0.59</td></tr><tr><td>National average</td><td>1.28</td><td>0.57</td></tr></table>	Region	Urban area	Rural areas	Savanes	1.03	0.51	Kara	1.22	0.45	Centrale	1.08	0.46	Plateaux	1.68	0.69	Maritime	1.26	0.59	National average	1.28	0.57	See appendix
Region	Urban area	Rural areas																							
Savanes	1.03	0.51																							
Kara	1.22	0.45																							
Centrale	1.08	0.46																							
Plateaux	1.68	0.69																							
Maritime	1.26	0.59																							
National average	1.28	0.57																							
$BC_{BL,PP,y}$ under AMS-I.E	tonnes/person/year	Average annual consumption of woody biomass per person before the start of the project activity	<p>(b) The national average value in the table above may be used only if project participants can demonstrate that the regions where the project devices are going to be deployed cannot be precisely identified (e.g. at the time of PDD preparation).</p> <p>(c) Use the classification included in official documents or government publications to identify regions, and urban or rural areas.</p>																						

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 of baseline woody biomass consumption per person in Togo ($B_{old,p}$ 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)¹, in rural areas of the Togo, the percentages of the population that use firewood and charcoal for cooking are 82.3% and 17.4% respectively. In the urban areas, the percentages of the population that use firewood and charcoal for cooking are 13.4% and 81.8% respectively.
4. Taking into account national circumstances in Togo, the DSB has defined region-specific default values 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 CPA-DDs of PoAs registered from the country as well as literature such as national studies and reports were reviewed. The values reported in the literature are shown in Table 1. A detailed explanation of values reported in the literature and CPA-DDs is included in paragraphs below.

¹ 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)

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

			Standardized values in tonnes air-dry per capita [tonnes/person-year]					
			Urban areas			Rural areas		
			Annual firewood consumption	Annual charcoal consumption	Annual total woodfuel (wood eq.)	Annual firewood consumption	Annual charcoal consumption	Annual total woodfuel (wood eq.)
Centre de Recherche et d'Ingénierie Sociales du Togo (CRISTO), 2007. Enquetes Consommation des Energies Domestiques au Togo – Août 2007 for the Togo Ministry of Energy. [1]	Savanes	2007	0.260	0.129	1.034	0.426	0.014	0.510
	Kara	2007	0.216	0.168	1.224	0.337	0.018	0.445
	Centrale	2007	0.227	0.142	1.079	0.384	0.013	0.462
	Plateaux	2007	0.236	0.240	1.676	0.393	0.049	0.687
	Maritime	2007	0.232	0.172	1.264	0.264	0.055	0.594
	National average	2007	0.232	0.175	1.282	0.354	0.037	0.574

References and notes:

1. “Enquetes Consommation des Energies Domestiques au Togo – Août 2007” prepared by Centre de Recherche et d'Ingénierie Sociales du Togo (CRISTO) for the Togo Ministry of Energy
6. The following paragraphs provide more details of the study listed in the table above:
7. The “Enquetes Consommation des Energies Domestiques au Togo – Août 2007” was prepared by Centre de Recherche et d'Ingénierie Sociales du Togo (CRISTO) for the Togo Ministry of Energy. This official report is based on a field survey, covering 2500 households (around 0.38% of the total population) across the five administrative regions (Savannah, Kara, Central, Plateau and Maritime) covering urban and rural populations. It provides data on average firewood and charcoal consumption per capita for rural and urban households in the five regions of Togo. The comprehensive study provided the data on average consumption of firewood and charcoal for the sampled users in respective regions, however it did not indicate if there were households that used only wood or only charcoal i.e. disaggregated data for households using only wood and households using only charcoal were not provided. Given the predominance of charcoal use in urban areas and wood use in rural areas, this aspect will not have significant impact on the standardized baseline values proposed even if there are some households exclusively using charcoal or wood.
8. To convert the charcoal consumption value into the woody biomass equivalent of charcoal consumed, a default value (6 kg of wood input per kg of charcoal) provided by the methodology is used².
9. There are two registered cookstove PoAs in Togo, and both refer to the CRISTO report mentioned above as the basis for calculating the baseline woody biomass consumption.
 - (a) PoA 9815: Man and Man Enterprise Improved Cooking Stoves Programme in Togo
 - (i) CPA 9815-0001: Man and Man Enterprise Improved Cooking Stoves Programme in Togo;

² The methodology AMS-II.G provides two options: i) a default wood to charcoal conversion factor of 6 kg of firewood (wet basis) per kg of charcoal (dry basis); ii) credible local conversion factors determined from a field study or literature.

- (b) PoA 9666: Promoting Efficient Stove Dissemination and Use in West Africa
 - (i) CPA 9666-0001: Promoting Efficient Stove Dissemination and Use in West Africa – CPA 001 Togo;
 - (ii) CPA 9666-0002: Promoting Efficient Stove Dissemination and Use in West Africa – CPA 002 Togo;
 - (iii) CPA 9666-0003: Promoting Efficient Stove Dissemination and Use in West Africa – CPA 003 Togo.
10. In addition, international data sources like FAO and UN Energy statistics were also reviewed, and their summary is described in the attachment. It was considered that these sources are associated with large uncertainties due to various assumptions made and may be disregarded for the purpose of this standardized baseline.

3. Recommendation

11. In analysing all available data sources in the Table 1, PoA-DDs and the attachment, 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.
12. In the case of Togo, the most reliable source proved to be the study report “Enquetes Consommation des Energies Domestiques au Togo – Août 2007” commissioned by Togo Ministry of Energy. Therefore, based on the above analysis, the following values are recommended as standardized values for the baseline woody biomass consumption:
- (a) Use values in table 2 below, according to the location of households (i.e. regions, and urban areas or rural areas);

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

Region	Urban area	Rural areas
Savanes	1.03	0.51
Kara	1.22	0.45
Centrale	1.08	0.46
Plateaux	1.68	0.69
Maritime	1.26	0.59
National average	1.28	0.57

- (b) The national average value in the table above may be used only if project participants can demonstrate that the regions where the project devices are going to be deployed cannot be precisely identified (e.g. at the time of PDD preparation).
- (c) Use the classification included in official documents or government publications to identify regions, and urban or rural areas.

Attachment. The values reported in international data sources

- The following paragraphs provides more details of the international data sources listed in table 3.

Table 3. Average annual consumption of woody biomass per person reported in international data sources reviewed for Togo

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.)
FAOstat 2016 [1]		2014	0.464			0.464		
		2014		0.428			0.428	
Energy Statistic Database (2016) of the United Nations Statistic Division. [2]		2013	0.678			0.678		
		2013		1.282			1.282	

References and notes:

- FAOstat. Accessed on 31 August 2016 from <http://faostat3.fao.org/download/F/FO/E>
- Energy Statistic Database (2016) of the United Nations Statistic Division. Accessed on 31 August 2016 from <http://data.un.org/Explorer.aspx?d=EDATA>
- The data for firewood and for charcoal are presented in terms of woody biomass equivalent (air-dry) per person per year. The data is representative of main users of biomass fuel. Per capita consumption values relative to the total population were transformed to the values relative to main users, based on the information on the penetration (i.e. the main source of fuels used for cooking in urban and rural areas) from the UNDP and WHO (2009). See Table for the values used for conversion. To convert the charcoal consumption value into the woody biomass equivalent of charcoal consumed, 6 kg of wood input per kg of charcoal is used as a default factor from AMS-II.G.³
- Conversion factors and assumptions applied in transformation of consumption values are as follows:

Table 4 Conversion factors and assumptions applied in transformation of consumption values

Assumed moisture fraction of air-dry wood	Assumed air-dry wood t/ m ³	Assumed fraction of hh consumption to total consumption	Assumed kg ad wood / kg of charcoal
0.2 ^a	0.725 ^a	0.85 ^b	6 ^a

³ The methodology AMS-II.G provides two options: (i) a default wood to charcoal conversion factor of 6 kg of firewood (wet basis) per kg of charcoal (dry basis); (ii) credible local conversion factors determined from a field study or literature.

a Default value

b Standard value, applied in absence of national references. Applied to rural and urban consumption equally.

Table 5. Population data, fuelwood and charcoal penetration

	Rural population ^a (‘000)	Urban population (‘000)	Total population (‘000)	Rural fuelwood penetration ^b	Urban fuelwood penetration	Rural charcoal penetration	Urban charcoal penetration
2014	4,233	2,760	6,993	82.3	13.4	17.4	81.8
2013	4,160	2,657	6,817	82.3	13.4	17.4	81.8

a Population data is from UN population statistics. World Urbanization Prospects: The 2014 revision

b WHO and UNDP, 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)

4. It was considered that the above calculated values are associated with large uncertainties due to various assumptions made and therefore less reliable. Therefore, these values were not selected considering that superior information was available through other sources.

Document information

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01.0	22 February 2017	Initial publication. This standardized baseline is approved by CDM Executive Board in accordance with the “Procedure for development, revision, clarification and update of standardized baselines” (CDM-EB63-A28-PROC).

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