



Proposed standardized baseline submission form (Version 02.0)

To be used by a designated national authority (DNA) when submitting a proposed standardized baseline in accordance with the "Procedure: Development, revision, clarification and update of standardized baselines" (CDM-EB63-A28-PROC).

INFORMATION TO BE COMPLETED BY THE DNA

Title of the proposed standardized baseline:	Standardised Baseline for Institutional Cook stoves in Uganda.
Name(s) of the Party or Parties to which the proposed standardized baseline applies:	Uganda
DNA submitting this form:	Uganda (Ministry of Water and Environment Climate Change Department/DNA Secretariat)
Is this one of the first three submissions for a Party with 10 or fewer than 10 registered CDM project activities as of 31 December 2010? <i>(For such a Party, the submission of an assessment report may be omitted. Not required to check Yes or No if the submission is for a group of Parties.)</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Attachments:

- ☒ Additional documentation supporting the submission (e.g. relevant data, documentation, statistics, studies, calculation tables, etc.), where applicable (Please specify below)
 Calculation Spreadsheet
- ☒ Data used to establish the proposed standardized baseline
- ☐ An assessment report on the quality of the data collection, processing and compilation prepared by a designated operational entity (DOE)
- ☐ Letters of approval of all the DNAs of the Parties to which the proposed standardized baseline applies, where the standardized baseline applies to a group of Parties

Name of authorized officer signing for the DNA:	Chebet Maikut
Date (DD/MM/YYYY) and signature for the DNA:	28 November 2014,
Contact information of the focal point(s) of the DNA: <i>(Names, email-addresses and phone contacts for procedural and technical communication on the submission)</i>	Mr. Chebet Maikut Ag. Commissioner/DNA Focal Point Climate Change Department, NFA Grounds 10/20 Spring Rd, Nakawa P.O. Box 28119, Kampala - Uganda Email: chmaikut@gmail.com Telephone: +256 414 237 690 (Office) Cell: +256 752 609 414
Name(s) of the proponent(s) of the proposed	The Designated National Authority of Uganda

PROPOSED STANDARDISED BASLINE!!!!
(CDM-PSB) - Version 02.0



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standardized baseline:	
Affiliation of the proponent(s): <i>(The definition of “admitted observer organization” can be found at http://unfccc.int/resource/ngo/art7_6.pdf)</i>	<input checked="" type="checkbox"/> Party <input type="checkbox"/> Project Participant (PP) <input type="checkbox"/> International Industry Organization <input type="checkbox"/> Admitted Observer Organization
Contact information of the focal point(s) of the proponent (s): <i>(Names, email-addresses and phone contacts for procedural and technical communication on the submission. Not required to complete this section if the DNA(s) is(are) the proponent(s) of the proposed standardized baseline.)</i>	N/A



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**Proposed standardized baseline submission form
CDM-PSB-FORM (Version 02.0)**

Title: Standardized Baseline for Institutional Cook Stoves in Uganda

Submission date: 06/11/2014

Version number: 1.0

Approach

The standardised baseline was developed using approach contained in the following approved small-scale methodologies:

- *AMS-II.G Energy efficiency measures in thermal applications of non-renewable biomass (version 6.0)*
- *AMS-I.E Switch from non-renewable biomass for thermal applications by the user (version 5.0)*

For demonstration of additionality, the following guidelines are applied:

- *Guidelines on the demonstration of additionality of small-scale project activities (version 9.0)*

Elements to be standardized

Please check below all the elements to be standardized by the proposed standardized baseline.

☒ Additionality demonstration

☒ Baseline identification

☒ Baseline emission/removal estimation

☐ Land eligibility demonstration (applicable only to afforestation and reforestation project activities).

Further inputs requested to the DNA (To be completed by the secretariat)

Please provide a list of additional information and/or modifications that are required.



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**SECTION A: PROPOSED STANDARDIZED BASELINE DEVELOPED USING THE
“GUIDELINES FOR THE ESTABLISHMENT OF SECTOR SPECIFIC STANDARDIZED
BASELINES”**

*Please complete this section only when the proposed standardized baseline is developed using the
“Guidelines for the establishment of sector specific standardized baselines”.*

Applicability of the proposed standardized baseline

N/A

Additionality demonstration

N/A

Baseline identification

N/A

Baseline emission factor estimation

N/A

Use of the proposed standardized baseline with an approved methodology

N/A

Validity of the proposed standardized baseline

N/A

Deviations from the guidelines (if applicable)

N/A

References and any other information



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SECTION B: PROPOSED STANDARDIZED BASELINE DEVELOPED USING A METHODOLOGICAL APPROACH CONTAINED IN AN APPROVED METHODOLOGY

Please complete this section only when the proposed standardized baseline is developed using a methodological approach contained in the latest version of an approved methodology.

Applicability of the proposed standardized baseline

- Host country(ies) or region(s) within a host country to which the standardized baseline is applicable: **Uganda**
- Sector(s) to which the standardized baseline is applied: **Institutional and Commercial Kitchens**
- Output(s) to which standardized baseline is applied: **Institutional and Commercial Cooking**
- The measure(s) to which the proposed standardized baseline is applicable is/are:
 - ☒ Fuel and feedstock switch;
 - ☒ Switch of technology with or without change of energy source (including energy efficiency improvement);

The cook stoves catering to a larger group of people in institutional and commercial setups are referred to as ‘Institutional cookstoves’¹. (Impact Carbon, 2012) (Practical Action)

Additionality demonstration (if applicable)

The proposed standardised baseline has followed the “Guidelines on the demonstration of additionality of small-scale project activities”. Clause 2 of this guideline declares that documentation of barriers is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW).

The institutional improved cook stoves fall under the project category in clause 2 part (c) of this guideline stating that “*Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds*”, and therefore do not need to provide documentation to demonstrate additionality.

Cook stoves are isolated units; the users in this specific case are institutions such as schools, prisons, hospitals and commercial establishments² (GIZ PREEP).

A cookstove may be classified as institutional cookstove if:

¹The institutional cookstoves are typically designed for 10-150 litre cooking capacity. Cookstoves of higher capacities with size ranging from 200-600 litre cooking capacity are also available. However the cooking vessels with capacities higher than 300-litre are difficult to handle.

² Commercial establishments such as restaurants selling cooked food, farming estates that provide meals for their workers, for instance Tea estates, Sugar factories, coffee plantations etc.



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- The stove is catering for more than 50 people;
- The stove is above 20litre capacity(GACC, 2012)

The above two definitions, are fairly similar as 0.5L stove size is considered per person;

Moreover, the size of each unit is less than 5% of the small-scale thresholds.

- For Type I: The small-scale threshold is not beyond 15 MWe (45 MW_{th}) per annum. The 5% limit for this type of projects is 2.25MW_{th}; and
- For Type II: The small-scale threshold for this type of projects is not to exceed the equivalent of 60 GWh (180GW_{th})per annum. The 5% limit for this type of project is 9GWh_{th}.

The tables below provide sample calculation of the population size per institution to breach the 5% threshold as defined above.

Table 1: Demonstration of the 5% rule for type I projects

Parameter	Unit	Value	Source
Fuelwood consumption per year per capita	Tons	0.589	Table 5
Number of persons per institution	Number	2008	Calculated
Fuelwood consumption per year per Institution	Tons	1182.7	Calculated
NCV of fuelwood	TJ/tonne	0.015	AMS-I.E
Energy consumption stove	MWh-th per year	4928	Calculated
Maximum capacity (6 hr cooking per day)	MW-th	2.250	Calculated
SSC CDM threshold for type I	MW-th	45	AMS-I.E
Max capacity of each CS as a percentage of SSC CDM threshold	%	5.000%	Calculated

Table 2: Demonstration of the 5% rule for type II projects

Parameter	Unit	Value	Source
Fuelwood consumption per year per capita	Tons	0.589	Table 5
Number of persons per institution	Number	5258	Calculated
Fuelwood consumption per year per institution	Tons	3097	Calculated
Efficiency of traditional cookstove	Fraction	0.121	Table 8
Efficiency of ICS	Fraction	0.40	Table 8
NCV of fuelwood	TJ/tonne	0.015	AMS-II.G
Fuel savings per cookstove per year	Tons	2160.13	Calculated
Energy savings per cookstove per year	GWh-th	9.0000	Calculated
SSC CDM threshold for type II per year	GWh-th	180	AMS-II.G
Energy savings of each improved cookstove as a percentage of SSC CDM threshold	%	5.00%	Calculated



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In addition to above tables, the maximum size of cookstove is observed to support 600 litre cooking capacity. This means that population size that can be supported by single cookstove can approximately be 1200 (assuming 0.5litre per person) (Impact Carbon, 2012). The population size of institutions complies with additionality threshold for Type I and Type II projects.

Table 3: Typical population size in institutional setup

Type of Institution	Population (attribute)	Source
Schools	<2000	(Northern Uganda Energy Study, 2011) (Improved Institutional Cookstoves in Wakiso District - Baseline Survey Report, 2012) (page – viii) (Presentation for the use of efficient coosktoves, 2010) (page – 2) (Inspection and evaluation of institutional stoves adoption and performance in schools and institutions , 2011) (page – Raw Data)
Prisons	< 1000	(Statistical Return, 2009) (Page – 4)
Hospitals	< 1500 (bed capacity)	(Human Resources for Health Country Profile Uganda , 2009) (Table 2.4, 2.6)
Restaurants / Hotels (commercial eating business)	-	No data source available. The hotel and restaurants would cater to their guests at all three meals. However the customers to be catered by hotels and restaurants is expected to be lower than 1200.
Others such as Tea estates (with residential facilities)	-	The number of people employed will be catered by cookstoves at the facility. However the number of residents is expected to be lower than 1200.

The values in the above table indicate that Institutional cookstoves fulfil the requirements and thereby deemed additional. Further, to serve the indicated population size, multiple cookstoves are expected to be used. Therefore, institutional cookstove as a technology too are deemed additional.

Baseline identification (if applicable)

Please explain how the methodological approach contained in the latest version of the approved methodology was applied to identify the baseline. Follow the steps and guidance of the approved methodology. Document all underlying data, data sources, assumptions, calculation steps and outcomes in a clear and transparent manner.

Measure	Baseline Description (as per methodology)	Identified Baseline
Measure: Fuel Switch Methodology: AMS-IE	<i>This category comprises of thermal applications of non-renewable biomass.</i>	As per the Uganda National Communication (National Communication, 2002), the energy sector is predominantly dependent on wood fuel, which accounts for up to 93% of the countries total energy needs. The high demand for fuel wood has resulted into depletion of forests leading to land degradation.
Measure: Energy Efficiency Methodology:	<i>It is to be demonstrated that non-renewable biomass has been used since 31 December</i>	



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AMS-II.G.	<i>1989, using survey methods or referring to published literature, official reports or statistics.</i>	<p>The other sources of energy are petroleum and hydroelectricity accounting for 5% and 1.5% respectively. The hydroelectricity will primarily cater to electricity requirements in country. The fuel combustion breakdown in the country establishes that approximately 88% of the fuel is used in transportation and residential sector, leaving marginal quantities of fuel to be used for commercial / institutional setups. A recent paper, mentions that biomass contributes 90% of the energy needs for institutional setups and commercial buildings. (A Review of the Energy Situation in Uganda, 2014)</p> <p>Use of non-renewable biomass can be demonstrated when there is a depletion of biomass stock in forests or a reduction of forest coverage, which means that there has been an unsustainable use of the biomass resources. In Uganda, during the period 1990 to 2010 the extent of forest decreased from 4.751 million hectares 2.988 million hectares. Also, the carbon stock in living forest biomass decreased from 171 million tonnes to 109 million tonnes. (Global Forest Resources Assessment, 2010)</p>
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As tabulated above, it is evident that for cooking needs biomass is the energy source, also for institutional setups. As per the published literature, the depletion of forests over the years indicates that biomass used is non-renewable.

Therefore, in accordance with AMS-I.E and AMS-II.G, the baseline scenario would be the use of fossil fuels to meet similar thermal energy needs as those provided by the project devices.

Baseline emission estimation(if applicable)

Please explain how the methodological approach contained in the latest version of the approved methodology was applied to estimate the baseline emissions of a project activity or programme of activities in (a) country(ies) or region. Follow the steps and guidance of the approved methodologies. Document all underlying data, data sources, assumptions, calculation steps and outcomes in a clear and transparent manner. Note that the underlying methodology has to provide a methodological approach to derive the baseline emissions for a country or region in order to apply this step.

Following AMS.II-G, the emission reductions are calculated as follows:

The emission reductions are calculated as per the following formula:

$$ER_y = \sum_t ER_{y,t}$$



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Where:

- i = Indices for the situation where more than one type of project device is introduced to replace the pre-project devices
- ER_y = Emission reductions during year y in t CO₂e
- $ER_{y,i}$ = Emission reductions by project device of type i during year y in t CO₂e

As per footnote 3 of the methodology, for cookstove used in industrial / institutional (e.g. schools, hospitals, etc.), the following approach is used, provided that project participants are able to demonstrate that the maintenance program is in place.

$$ER_{y,i} = B_{y,savings,i} \times N_{y,i} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} - LE_y$$

Where:

- $B_{y,savings,i}$ Quantity of woody biomass that is saved in tonnes per oven or drier of type i in year y
- $f_{NRB,y}$ Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website.³ The parameter value may be fixed ex ante at the beginning of each crediting period.
- $NCV_{biomass}$ Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
- $EF_{projected_fossilfuel}$ Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t CO₂/TJ⁴
- $N_{y,i}$ Number of project devices of type i , operating in year y .
- LE_y Leakage emissions in the year y

From the above calculation for the emission reduction, parameters such as Net Caloric Value (NCV), Emission Factor (EF), have fixed default values, and for Uganda the value of f_{NRB} (fraction of non-renewable biomass) is also available. For leakage the option of multiplying $B_{y,savings,i}$ by a net to gross adjustment factor of 0.95 is preferred to reduce the need for surveys. The parameters with available default values are summarised below:

³ Default values endorsed by designated national authorities and approved by the Board are available at <<http://cdm.unfccc.int/DNA/fNRB/index.html>>.

⁴ This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50 per cent weight is assigned to coal as the alternative solid fossil fuel (96 t CO₂/TJ) and a 25 per cent weight is assigned to both liquid and gaseous fuels (71.5 t CO₂/TJ for kerosene and 63.0 t CO₂/TJ for liquefied petroleum gas (LPG)).



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Table 4: Default parameters for application of AMS-II.G

Baseline Factor Available	Value	Source
NCV: Net Calorific Value	0.015 TJ/tonne	IPCC default value for wood fuel
Emission Factor	81.6 t CO ₂ /TJ	Default value provided in AMS-II.G
Leakage Net to Gross Adjustment Factor	0.95	Default value provided in AMS-II.G
Fraction of non-renewable Biomass	82%	http://cdm.unfccc.int/DNA/fNRB/index.html

In order to calculate the emission reductions, $B_{y,savings,t}$ remains to be determined. The methodology provides three approaches of determining this parameter.

Option 1: Kitchen

Performance Test (KPT)

$$B_{y,savings,t,a} = B_{old,t} - S_{a=1,t,KPT} \times \Delta B_{y,t,a}$$

Option 2: Water Boiling Test

(WBT)

$$B_{y,savings,t,a} = B_{old,t} \times \left(1 - \frac{\eta_{old}}{\eta_{new,t,a=1} \times \Delta \eta_{y,t,a}}\right)$$

Option 3: Controlled Cooking

Test (CCT)

$$B_{y,savings,t,a} = B_{old,t} \times \left(1 - \frac{SC_{new,t,a=1} \times \Delta SC_{y,t,a}}{SC_{old,t}}\right)$$

In the context of institutional cookstoves, with maintenance program in place the performance of cookstove is considered to be stable over time. Efficiency loss factors due to age of cookstoves have no impact on the calculations and the above equations can be represented as follows:

Option 1: Kitchen

Performance Test (KPT)

$$B_{y,savings,t} = B_{old,t} - B_{t,KPT}$$

Option 2: Water Boiling Test

(WBT)

$$B_{y,savings,t} = B_{old,t} \times \left(1 - \frac{\eta_{old}}{\eta_{new,t}}\right)$$

Option 3: Controlled Cooking

Test (CCT)

$$B_{y,savings,t} = B_{old,t} \times \left(1 - \frac{SC_{new,t}}{SC_{old,t}}\right)$$

Establishment of the baseline fuel wood consumption ($B_{old,t}$)

As per methodology, para 19, $B_{old,t}$ can be determined, in the following manner:

- Estimated as the annual consumption of woody biomass (tonnes/year) derived from historical data or a sample survey of local usage;
- Calculated from thermal energy generated.
- Default Value of 0.5 tonne per capita per year

To simplify the calculation approach, $B_{old,t}$ is determined on per capita basis. The woody biomass consumption pattern for cooking needs is assessed. Biomass accounts for 93% of the total energy consumption in the country, and cooking needs for both residential and institutional sectors (Ministry of Energy and Mineral Development, 2001).



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Table 5: Consumption of Woody Biomass for cooking in various regions of Uganda

Woody biomass consumption (tonnes/person/annum)	Reference Region	Source
0.680	Uganda	(East African Community, 2008)
0.542	East Uganda – Soroti district	(Coping with Firewood Scarcity in Soroti District of Eastern Uganda, 2014)
0.692	West Uganda – Hoima district	(A system Approach to Fuelwood Status in Uganda: A Demand-Supply Nexus, 2008)
0.601	West Uganda – Kibale district	(Fuelwood Resources and Forest Regeneration on Fallow Land in Uganda, 2002)(8.4/5.1*365)
0.485	North Uganda – Uleppi district	(Biogas as an alternative to fuelwood for a household in Uleppi sub-county in Uganda , 2013) (1.33 X 365)
0.540	Uganda	(Disappearing forests of Uganda: The way forward , 2001)
0.582	Uganda	(Woodfuel Integrated Supply/Demand Overview Mapping (WISDOM) Methodology , 2005)(Page -64, Table - Summary table of total and per capita fuelwood and charcoal consumption and of map-adjusted values) $0.909 \text{ m}^3 \text{ per person} \times 725 \text{ kg/m}^3 = 0.582$
0.589	Average fuel wood consumption	

Based on the cited literature, the average fuel wood consumption per person per annum in Uganda is 0.589 tons.

The value of $B_{old,i}$ for various institutions is assessed based on average consumption per person and the type of institution.

Table 6: Assessment of $B_{old,i}$ for various institutional setups in Uganda

Institution Type	Value of $B_{old,i}$ (tons/person/yr)	Assessment
Boarding Schools	0.3807	<p>The boarding school setup is comparable to households. The schools are operational for only 236 to 250 days a year (Ministry of Education, 2014). Therefore, approximate consumption for schools is 0.381(for 236 day consumption in a year). ($0.589 \times 236 / 365$)</p> <p>As per ‘Inspection and evaluation of institutional stoves adoption and performance in schools and institutions’ report published by MEMD in October 2011, the fuel wood usage in schools with traditional cooking technology ranges from 0.1875 tonne to 0.45 tonnes. This range includes both boarding and non-boarding school setups. (Ministry of Energy and Mineral Development, 2011)</p> <p>Also it is understood that many schools in Uganda, do not have resources to serve meals. The students continue attending school while hungry. Thereby reported values for fuel wood consumption by schools are expected to be lower. (Breakfast, midday meals and academic achievement in rural</p>



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		primary schools in Uganda: implications for education and school health policy, 2012) The proposed value of $B_{old,i}$ will also address the suppressed demand component of fuel consumption and requirement.
Day Schools	0.1904	In continuation with methodology used for boarding schools, the day schools will cater only one meal during the school day (in majority cases) and thereby use half the value estimated for boarding schools.
Residential Institutions: Prisons, Plantation estates and Hospitals	0.589	The residential institutions cater to daily cooking needs of the residents on the premises. These institutes operate all around the year. Further the published news reports suggest that meal consumptions are inadequate in prisons indicating that the proposed value will address the suppressed demand aspect. (Uganda Prisons in shilling 21.2bn shortfall for food, 2014).
Commercial Institutions: Restaurants, Hotels, Eateries	0.589	The institutions preparing food for commercial purposes cater to food at all times during the day.

The values from Table 6, will replace para 19 (c) of the methodology.

Establishment of the efficiency of the baseline cookstove (η_{old})

The 90% of basic cooking needs in country are fulfilled using biomass resources in households, institutions and commercial building. In 2007, the adoption of institutional cookstoves in Uganda was reported at 450. As a part of 'Modern Energy Services Programme' the cumulative target for institutional stoves by 2012 was 1500 (The Renewable Energy Policy of Uganda). As per MEMD Annual Report for 2011, the ministry with support from GIZ/PREEEP has done the dissemination of both household and institutional cookstoves. A total of 77 institutions and SMEs were reached under this programme. Further, the report states that less than 5% of the schools surveyed have energy efficient stoves, while most of the schools use traditional cooking technologies. (Institutional stove survey and evaluation) (Annual Report, 2011). Less than 2000 improved institutional cookstoves have been disseminated in the country over the past 6 years (P J Turyareeba, 2010).

The institutions in Uganda such as schools, health centres, prisons, commercial buildings and restaurants, primarily rely on traditional cooking technologies such as three stone stoves, open fires etc. (National Biomass Energy Demand Strategy 2001 – 2010, 2001). Further the government of Uganda identifies implementation of improved cookstoves in households and institutions as a potential investment sector under 'Scaling up Renewable Energy in Low Income Countries Program (SREP)'. (Expression of interest to participate in SREP, 2014)

Paragraph 17, option b) of the methodology provides guidance on the establishment of the baseline efficiency. It states that "a default value of 0.10 may be optionally used if the pre-project device is a three stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; for other types of devices, a default value of 0.2 may be optionally used. Use weighted average values (taking the amount of woody biomass consumed by each device as the weighting factor) if more than one type of device is being replaced".



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Assuming that any institutional, which is currently used, could be replaced, the weighted average value needs to be calculated. For estimation of weighted average efficiency, the numbers of institutional and commercial kitchens (target sector) is compiled in Table 7. Subsequently the number of improved stove installations and corresponding efficiency is conservatively applied for calculation.

Table 7: Number of Institutions in Uganda

Type of institution	Numbers	Remark
Schools	25993	Includes pre-primary, primary, secondary, post-primary schools and Non-Formal Schools. (Uganda Bureau of Statistics, 2009)
Health Units	2545	(Africa Health Workforce Observatory, 2009)
Prisons	239	(International Centre for Prison Studies)
Commercial	-	For the lack of credible data sources, the number of commercial institutions is not cited. However, this is conservative in the given context of weighted average efficiency computation.

Table 8: Efficiency Calculation for Institutional Cookstoves

Description	Value	Efficiency	Remark
Total number of institutional and commercial units	28777	-	The total number of institutions from Table 7
Number of institutions with improved cookstoves	2000	0.40	(P J Turyareeba, 2010) (The Renewable Energy Policy of Uganda) The higher value in the range of efficiency suggested for improved institutional stoves is applied.(Practical Action)
Traditional Cooking technology	26777	0.1	$28777 - 2000 = 26777$ The efficiency of traditional cookstoves is as per the methodology AMS.II.G and AMS.I.E
Weighted Average Efficiency η_{std}		0.121	$(26777 \times 0.1 + 2000 \times 0.4) / 28777$

Since the biomass consumption is presented on per capita basis, therefore the computation for emission reductions is based on the population served instead of number of devices. In other words, the parameter $N_{y,t}$ is interpreted as population served.

Following AMS.I-E, the emission reductions are calculated as follows:

The emission reductions are calculated as per the following formula:

$$ER_y = E_y \times f_{NEE_y} \times NCV_{biomass}$$

Where:

ER_y Emission reductions during the year y in tCO₂e



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B_y	Quantity of woody biomass that is substituted or displaced in tonnes
$f_{NRB,y}$	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website ⁵
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ ⁶

From the above calculation for the emission reduction, parameters such as Net Caloric Value (NCV), Emission Factor (EF), have fixed default values, and for Uganda the value of f_{NRB} (fraction of non-renewable biomass) is also available. The parameters with available default values are summarised below:

Table 9: Default parameters for application of AMS-I.E

Baseline Factor Available	Value	Source
NCV: Net Calorific Value	0.015 TJ/tonne	IPCC default value for wood fuel
Emission Factor	81.6 t CO ₂ /TJ	Default value provided in AMS-I.E
Fraction of non-renewable Biomass	82%	http://cdm.unfccc.int/DNA/fNRB/index.html
Leakage Net to Gross Adjustment Factor	0.95	Default value provided in AMS-I.E

In order to calculate the emission reductions, B_y remains to be determined. In the context of cooking, the methodology provides the following options:

Option a: Estimated as the annual consumption of woody biomass (tonnes/year) derived from historical data or a sample survey of local usage

Option b: Calculated from thermal energy generated

As detailed in the case of AMS – II.G, determination of B_y for institutional setups, would be appropriate on per capita basis. Further, the per capita fuel required to cater for cooking needs in institutional setup is comparable to households, wherein breakfast, mid-day meal and supper is served.

The value of B_y for various institutions is presented in the following table:

Table 10: Assessment of $B_{old,i}$ for various institutional setups in Uganda

Institution Type	Value of B_y (tons/person/yr)
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⁵ Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/DNA/fNRB/index.html>.

⁶ This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 tCO₂/TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 tCO₂/TJ for kerosene and 63.0 tCO₂/TJ for liquefied petroleum gas (LPG)).

**PROPOSED STANDARDIZED BASELINE SUBMISSION FORM
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Boarding Schools	0.3807
Day Schools	0.1904
Residential Institutions: Prisons, Plantation estates and Hospitals	0.589
Commercial Institutions: Restaurants, Hotels, Eateries	0.589

Use of the proposed standardized baseline with the approved methodology

Please explain how the proposed standardized baseline will be used with the latest version of the relevant approved methodology(ies), i.e. which (parts of) the approved methodology(ies) are replaced by the proposed standardized baseline.

This Standardized baseline will replace the following aspects of the approved methodologies.

AMS-II.G

1. Baseline:

- It is established that woody biomass is used for cooking needs in baseline.
- It is established that non-renewable biomass has been used in Uganda since 31 December 1989.

2. Additionality: Implementation of improved institutional cookstoves is deemed to be automatically additional.

3. Emission Reduction: The default and standardized parameters are presented in table below.

Table 11: Default and Standardized Parameters for AMS-II.G

Parameters	Value										
NCV: Net Calorific Value	0.015 TJ/tonne										
Emission Factor	81.6 t CO ₂ /TJ										
Leakage Net to Gross Adjustment Factor	0.95										
Fraction of non-renewable Biomass	82%										
$B_{old,i}$	<table border="1"> <thead> <tr> <th>Institution Type</th><th>Value of $B_{old,i}$ (tons/person/yr)</th></tr> </thead> <tbody> <tr> <td>Boarding Schools</td><td>0.3807</td></tr> <tr> <td>Day Schools</td><td>0.1904</td></tr> <tr> <td>Residential Institutions: Prisons, Plantation estates and Hospitals</td><td>0.589</td></tr> <tr> <td>Commercial Institutions: Restaurants, Hotels, Eateries</td><td>0.589</td></tr> </tbody> </table>	Institution Type	Value of $B_{old,i}$ (tons/person/yr)	Boarding Schools	0.3807	Day Schools	0.1904	Residential Institutions: Prisons, Plantation estates and Hospitals	0.589	Commercial Institutions: Restaurants, Hotels, Eateries	0.589
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Day Schools	0.1904										
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Commercial Institutions: Restaurants, Hotels, Eateries	0.589										
Efficiency of baseline cookstoves (η_{old})	0.121										



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AMS-I.E.

1. Baseline:

- It is established that woody biomass is used for cooking needs in baseline.
- It is established that non-renewable biomass has been used in Uganda since 31 December 1989.

2. Additionality: Implementation of renewable energy projects for cooking needs in institutional setups is deemed to be automatically additional.

3. Emission Reduction: The default and standardized parameters are presented in table below.

Table 12: Default and Standardized Parameters for AMS-I.E.

Parameters	Value										
NCV: Net Calorific Value	0.015 TJ/tonne										
Emission Factor	81.6 t CO ₂ /TJ										
Leakage Net to Gross Adjustment Factor	0.95										
Fraction of non-renewable Biomass	82%										
B _y	<table> <tr> <th>Institution Type</th><th>Value of B_y (tons/person/yr)</th></tr> <tr> <td>Boarding Schools</td><td>0.3807</td></tr> <tr> <td>Day Schools</td><td>0.1904</td></tr> <tr> <td>Residential Institutions: Prisons, Plantation estates and Hospitals</td><td>0.589</td></tr> <tr> <td>Commercial Institutions: Restaurants, Hotels, Eateries</td><td>0.589</td></tr> </table>	Institution Type	Value of B _y (tons/person/yr)	Boarding Schools	0.3807	Day Schools	0.1904	Residential Institutions: Prisons, Plantation estates and Hospitals	0.589	Commercial Institutions: Restaurants, Hotels, Eateries	0.589
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Validity of the proposed standardized baseline

The standardized baseline shall be valid for a period of 3 years from the date of approval by the EB. The standardized baseline thereafter will be updated every three years, based on the most recent available data at the time of making the updates, as well as the relevant methodological tool and guidelines.

Deviations from the approved methodology (if applicable)

Nil



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References and any other information

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**SECTION C: PROPOSED STANDARDIZED BASELINE DEVELOPED USING A
METHODOLOGICAL APPROACH CONTAINED IN AN APPROVED TOOL**

Please complete this section only when the proposed standardized baseline is developed using a methodological approach contained in the latest version of an approved tool. An example for this is the application of the “Tool to calculate the emission factor for an electricity system” to estimate the emission factor for an electric grid.

Applicability of the proposed standardized baseline

N/A

Baseline emission factor estimation

N/A

Validity of the proposed standardized baseline

N/A

Deviations from the approved tool (if applicable)

N/A

References and any other information



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**SECTION D: PROPOSED STANDARDIZED BASELINE DEVELOPED USING THE
“GUIDELINE: ESTABLISHMENT OF STANDARDIZED BASELINES FOR
AFFORESTATION AND REFORESTATION PROJECT ACTIVITIES UNDER THE CDM”**

Please complete this section only when the proposed standardized baseline is developed using the guideline “Establishment of standardized baselines for afforestation and reforestation project activities under the CDM”.

Applicability of the proposed standardized baseline

N/A

Additionality demonstration

N/A

Baseline identification

N/A

Baseline removals estimation (if applicable)

N/A

Land eligibility demonstration (if applicable)

N/A

Validity of the proposed standardized baseline

Please state the period of time for which the proposed standardized baseline is valid.

Deviations from the guideline (if applicable)

N/A

References and any other information

PROPOSED STANDARDIZED BASELINE SUBMISSION FORM
(CDM-PSB-FORM) - Version 02.0



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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	1 December 2013	<p>The document title has changed from “Proposed standardized baseline form” (F-CDM-PSB) to “Proposed standardized baseline submission form” (CDM-PSB-FORM).</p> <p>Revision to:</p> <ul style="list-style-type: none">• Reflect updated requirements in the “Procedure: Development, revision, clarification and update of standardized baselines”• Include editorial improvement
01.0	23 March 2012	Initial publication.
<p>Decision Class: Regulatory Document Type: Form Business Function: Methodology Keywords: standardized baselines</p>		